

ForumIAS

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## Prelims Marathon

March, 2021

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*HISTORY*  
*ECONOMICS*  
*POLITY*  
*SCIENCE AND TECHNOLOGY*  
*GEOGRAPHY AND ENVIRONMENT*

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## *Services Sector*

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**Q.1)** Consider the following statements regarding the “gig economy”:

1. It undermines the traditional economy of full-time workers who rarely change positions and instead focus on a lifetime career.
2. India is the 5th largest country for flexi-staffing.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Gig economy can be defined as a work engagement where on one side, there is a service seeker i.e. a consumer with a demand for a specific task, and on the other side, and there is a service provider i.e. a gig worker who can perform that specific task.

- A gig economy undermines the traditional economy of full-time workers who rarely change positions and instead focus on a lifetime career.
- In this economy, tech-enabled platforms connect the consumer to the gig worker to hire services on a short-term basis.
- Gig workers include self-employed, freelancers, independent contributors and part-time workers.
- The digital gig economy generated a gross volume of approximately \$204 bn from worldwide customers in 2018.
- Transportation-based services contributed to over 50% of this value. The size of the gig economy is projected to grow by a 17% CAGR and generate a gross volume of ~\$455 bn by 2023.
- India has emerged as the 5th largest country for flexi-staffing after US, China, Brazil and Japan.
- Haryana, Madhya Pradesh, Andhra Pradesh, Gujarat and Telangana have most opportunities in terms of growth for the flexi-workers.

Source: The Hindu

**Q.2)** Which of the following are the objectives of the “National Digital Communications Policy”?

1. Broadband for all by 2022.
2. Creating 10 Million additional jobs in the Digital Communications sector.
3. Enhancing the contribution of the Digital Communications sector to 8% of India’s GDP from 6% in 2017.
4. Ensuring Digital Sovereignty.

Select the correct answer using the code given below:

- a) 1, 2 and 3
- b) 2, 3 and 4
- c) 1, 3 and 4
- d) 1, 2, 3 and 4

**ANS: C**

**Explanation:** The National Digital Communications Policy, 2018 seeks to unlock the transformative power of digital communications networks - to achieve the goal of digital empowerment and improved well being of the people of India; and towards this end, attempts to outline a set of goals, initiatives, strategies and intended policy outcomes.

The National Communications Policy aims to accomplish the following Strategic Objectives by 2022:

- Provisioning of Broadband for All
- Creating 4 Million additional jobs in the Digital Communications sector
- Enhancing the contribution of the Digital Communications sector to 8% of India's GDP from ~ 6% in 2017
- Propelling India to the Top 50 Nations in the ICT Development Index of ITU from 134 in 2017
- Enhancing India's contribution to Global Value Chains
- Ensuring Digital Sovereignty

Source: Sriram's IAS

**Q.3)** Which of the following measures will spur the economic growth?

1. Transparent and hassle free land acquiring.
2. Availability of Skilled labour.
3. Lower interest rates in the economy.
4. Decrease in effective demand.

Select the correct answer using the code given below:

- a) 1, 2 and 3
- b) 2, 3 and 4
- c) 1, 3 and 4
- d) 1, 2, 3 and 4

**ANS: A**

**Explanation:** The traditional argument is that the lower the interest rate, the better for businesses as it brings down the cost of capital, making investments more attractive.

- Any government would love this as the country would then draw higher investments leading to higher growth and more job creation.
- Governments abhor higher interest rates as, theoretically, these push up project costs and keep investors away.
- Capital is one of the three main factors of production, which are critical to the growth of a commercial entity, the other two being land and labour.
- But capital is only a necessary, not sufficient, condition. Land, unless allocated by the local government, is too costly for investors seeking to set up shop.
- On labour, even if adequate hands are available for a job, the skill quotient is still low. Training graduates to be job-ready is a form of tax that companies pay.
- Also to be taken into account is the market environment and demand. If end users are seeing lesser money in hand than earlier, demand will certainly be impacted.
- Therefore, in an environment where the other factors of production are not favourable for an investor, low interest rates by themselves may not prove attractive enough.
- Any revival of economic activity will be contingent on joint efforts by the government on the fiscal front to stimulate demand, and the RBI, to keep interest rates low.

Source: Sriram's IAS

**Q.4)** With reference to the new hydro policy 2019, which of the following statements is/are NOT correct?

1. It includes large hydro projects within the ambit of renewable energy.
2. It created additional resources for the development of large hydro projects.

Select the correct answer using the code given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** the Union Cabinet approved a new hydroelectricity policy that, among other things, included large hydro projects within the ambit of renewable energy.

- Prior to the policy, only small hydro projects of a capacity of less than 25 MW were treated as renewable energy. Large hydro projects were treated as a separate source of energy.
- India's renewable energy sector had an installed capacity of 75,055.92 MW as of February 2019, according to data with the Central Electricity Authority.
- This made up about 21.4% of the overall energy mix, with the rest coming from thermal, nuclear and large hydro sources.
- With the inclusion of large hydro in renewable energy, the energy mix changes drastically.
- Renewable energy capacity would now be 1,20,455.14 MW or 34.4% of the overall energy mix.

**Q.5)** The "GATI portal" is recently in news is related to which of the following?

- a) Ship Tracking
- b) Flight tracking
- c) National highways
- d) Inland water ways

**ANS: C**

**Explanation:** Terming delays in highway projects as "unacceptable", Road Transport and Highways Minister, asked officials and developers to strictly adhere to project schedules.

- Minister also launched online web portal 'GATI' on the pattern of 'PRAGATI', the portal used by the Prime Ministers' Office for monitoring projects.
- The portal 'GATI' can be accessed from NHAI's website, and contractors and concessionaires can raise any project-related issues on the platform, according to a statement by the Ministry of Road Transport and Highways.
- The issues raised on 'GATI' will be daily monitored by a team of NHAI officers and will be constantly reviewed by the senior officers of the National Highways Authority of India (NHAI) and the Ministry of Road Transport and Highways.

Source: The Hindu

**Q.6)** The Silver line project is sometimes seen in news is related to which of the following state?

- a) Goa
- b) Karnataka
- c) Andhra Pradesh
- d) Kerala

**ANS: D**

**Explanation:** The Kerala Rail Development Corporation (KRDCL) is confident that the ₹66,405-crore Thiruvananthapuram-Kasaragod semi-high-speed rail corridor project (named Silver Line) for which year 2024 has been set as the deadline, will be economically feasible and attain operational break-even within 10 years of being commissioned.

- Of the total cost of the 532-km project, around 50% will be loan at less than 1% interest from multilateral lending agencies such as KfW, AIIB (Asian Infrastructure Investment Bank), JICA (Japan International Cooperation Agency), or ADB (Asian Development Bank).
- Repayment is assured since there will be a rate of return of 8.1% on the investment. The balance amount will be raised from equity and (subordinate) debt from the State and Central governments.

Source: The Hindu

**Q.7)** The “Draft Scheme of Reconstruction” is recently in news is related to which of the following?

- a) Banking
- b) Railways
- c) Roadways
- d) Port rejuvenation

**ANS: A**

**Explanation:** RBI has placed the financially troubled Yes Bank under a moratorium (temporary suspension).

- After placing this bank under a moratorium, the RBI announced a draft Scheme of Reconstruction.
- This scheme entails the State Bank of India (SBI) investing capital to acquire a 49% stake in the restructured private lender.

Source: The Hindu

**Q.8)** Which of the following Insurance companies are works under General Insurance Corporation of India (GIC)?

1. National Insurance Company Ltd.
2. New India assurance Company Ltd.
3. Oriental Fire and Insurance Company Ltd.

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** In 1971, the government nationalised the private sector companies (107 Indian and foreign companies) playing in the general insurance segment and a government company, the General Insurance Corporation of India (GIC) was formed in 1972. The GIC started operation on January 1, 1973 with its four holding companies:

- National Insurance Company Ltd.
- New India Assurance Company Ltd.
- Oriental Fire and Insurance Company Ltd.
- United India Insurance Company Ltd.

Source: TMH Ramesh Singh

**Q.9)** Which of the following statements is/are correct about Agriculture Insurance Company of India Limited (AICIL)?

1. It was set up in 1962 to secure farmers who are promoting green revolution.
2. It is fully owned by General Insurance Corporation of India (GIC).

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** The public sector insurance company, Agriculture Insurance Company of India Limited (AICIL) was set up by the Government of India in December 2002 (commenced its business in April 2003).

- This is a dedicated agri-insurance company and aims “to serve the needs of farmers better and to move towards a sustainable actuarial regime”.
- This company was responsible to look after the National Agriculture Insurance Scheme (NAIS) which was launched in 1999.
- Since January 2016, the company is looking after the newly launched PMFBY (Prime Minister Fasal Bima Yojana) which subsumed the existing agri-insurance schemes— the NAIS and the Modified NAIS (of 2010).
- Till the AICIL was not set up, the agri-insurance responsibility of the government was being looked after by the General Insurance Corporation (GIC).
- AICIL is jointly promoted by public sector insurance companies and development financial institutions—majority shares owned by the GIC (35 per cent) and NABARD (30 per cent) while the four public sectors general insurance companies own 8.75 per cent each in it.

Source: TMH Ramesh Singh

**Q.10)** With reference to the Insurance Regulatory and Development Authority (IRDA), which of the following statements is/are correct?

1. It is a statutory body.
2. The chairman and its members are appointed by government.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The Insurance Regulatory and Development Authority (IRDA) was set up in 2000 (the Act was passed in 1999) with one chairman and five members (two as full time and three as part-time members) appointed and nominated by the government.

The authority is responsible for the regulation, development and supervision of the Indian insurance industry.

Source: TMH Ramesh Singh

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## *Infrastructure and Investment*

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**Q.1)** Consider the following statements regarding Accelerated Irrigation Benefit Programme (AIBP):

1. It was launched in 1996-97 to support major and medium irrigation projects
2. After launch of PMKSY in 2015-16, AIBP became a part of PMKSY

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Central Government launched the Accelerated Irrigation Benefits Programme (AIBP) in the year 1996-97 to provide Central Assistance to major/medium irrigation projects in the country, with the objective to accelerate implementation of such projects which were beyond resource capability of the States or were in advanced stage of completion.

Priority was given to those projects which were started in Pre-Fifth and Fifth Plan period and also to those which were benefiting Tribal and Drought Prone Areas.

After launch of PMKSY in 2015-16, AIBP became a part of PMKSY.

Since its inception, 297 Irrigation / Multi-Purpose Projects have been included for funding under AIBP. Out of this 143 projects have been completed and 5 projects were foreclosed.

Source: TMH Ramesh Singh

**Q.2)** Consider the following statements regarding Global Coalition for Disaster Resilient Infrastructure (CDRI):

1. It envisions enabling measurable reduction in infrastructure losses from disasters and extreme climate events.
2. It is launched by Government of India.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The Prime Minister of India launched the Coalition for Disaster-Resilient Infrastructure (CDRI) at the UN Secretary-General's Climate Action Summit in New York, US.

- The fledgling partnership has a secretariat in Delhi, supported by the UN Office for Disaster Risk Reduction (UNDRR), to enable knowledge exchange, technical support and capacity building.
- CDRI's mission is to rapidly expand the development of resilient infrastructure and retrofit existing infrastructure for resilience, and to enable a measurable reduction in infrastructure losses.
- Its mission statement notes that, in recent weather and climate-related disasters, up to 66% of public sector losses were related to infrastructure damage.

## PRELIMS MARATHON COMPILATION FOR THE MONTH OF MARCH 2021

- The partnership will be working in the areas of governance and policy, emerging technology, risk identification and estimation, recovery and reconstruction, resilience standards and certification, finance, and capacity development.

Source: The Hindu

**Q.3)** Consider the following statements regarding 'Rural Infrastructure Promotion Fund' (RIPF):

1. It has been created by Ministry of Rural Development.
2. It has been set up with a corpus of Rs. 25crore.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** NABARD has created a separate fund titled 'Rural Infrastructure Promotion Fund' (RIPF) to support programs and activities that promote rural infrastructure, with the ultimate objective of facilitating agriculture and rural development.

- RIPF has been set up with a corpus of Rs. 25 crore.
- The amount is contributed out of margin received by NABARD from a special window created under RIDF for funding the rural roads component of Bharat Nirman through National Rural Roads Development Agency (NRRDA).

Source: NABARD

**Q.4)** Consider the following statements regarding Foreign Portfolio Investment (FPI):

1. FPIs are short term investments and volatile in nature.
2. Portfolio investment does not offer control over the business entity in which the investment is made.

Which of the statements above given is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Foreign portfolio investment (FPI) refers to investing in the financial assets of a foreign country, such as stocks or bonds available on an exchange.

- This type of investment is at times viewed less favorably than direct investment because portfolio investments can be sold off quickly and are at times seen as short-term attempts to make money, rather than a long-term investment in the economy.
- Portfolio investment typically has a shorter time frame for investment return than direct investment.
- As with any equity investment, foreign portfolio investors usually expect to quickly realize a profit on their investments.
- Unlike direct investment, portfolio investment does not offer control over the business entity in which the investment is made.

Source: TMH Ramesh Singh



**PRELIMS MARATHON COMPILATION FOR THE MONTH OF MARCH 2021**

**Q.5)** The term 'Commanding heights of Indian economy' is related to which of the following?

- a) Public Sector Undertakings
- b) Agriculture
- c) Public Sector Banks
- d) Foreign capital

**ANS: A**

**Explanation:** India's first Prime Minister Jawaharlal Nehru, inspired by the then Soviet Union-pioneered model of state sponsored growth, who mooted the idea of placing the government—and within it the state-owned and state-run PSUs—as the commanding heights of the Indian economy.

It was documented in the Industrial Policy Resolution of 1956 and found articulation in the benchmark Second Five Year Plan. Till the beginning of the 1980s, the PSUs continued to be the commanding heights.

Source: TMH Ramesh Singh

**Q.6)** With reference to the "Indian Depository Receipts (IDR)", which of the following statements is/are NOT correct?

1. It is a mechanism that allows investors in India to invest in listed foreign companies.
2. IDRs are denominated in Indian Rupees and issued by a Domestic Depository in India.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** An IDR is a mechanism that allows investors in India to invest in listed foreign companies, including multinational companies, in Indian rupees. IDRs give the holder the opportunity to hold an interest in equity shares in an overseas company.

IDRs are denominated in Indian Rupees and issued by a Domestic Depository in India. They can be listed on any Indian stock exchange. Anybody who can invest in an IPO (Initial Public Offer) is/are eligible to invest in IDRs.

Source: TMH Ramesh Singh

**Q.7)** "Programme for Country Partnership (PCP)" is related to which of the following?

- a) UNCTAD
- b) UNIDO
- c) World Bank
- d) WEF

**ANS: B**

**Explanation:** The PCP is UNIDO's innovative model for accelerating inclusive and sustainable industrial development in Member States.

- Aligned with the national development agenda and focused on sectors with high growth potential, the programme supports a country in achieving its industrial development goals.
- The PCP rests on a multi-stakeholder partnership led by the host government. It builds synergies with ongoing government and partner interventions relevant to industrial development.

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- The PCP is also designed to leverage additional investment in selected priority sectors. As such, it is a model that facilitates the mobilization of partners and resources to achieve larger development impact.
- For UNIDO, the PCP serves to operationalize the Organization's mandate and SDG 9. At the same time, it is a model that can be used to implement other SDGs too.

Source: TMH Ramesh Singh

**Q.8)** Which of the following is/are eligibility criteria to be considered for grant of "Maharatna status" to Central Public Sector Enterprise (CPSE)?

1. Listed on Indian stock exchange.
2. Average annual turnover of more than Rs. 50,000crore, during the last 3 years.
3. Average annual net worth of more than Rs. 25,000crore, during the last 3 years.

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: A**

**Explanation:** The CPSEs fulfilling the following criteria are eligible to be considered for grant of Maharatna status.

- Having Navratna status.
- Listed on Indian stock exchange with minimum prescribed public shareholding under SEBI regulations.
- Average annual turnover of more than Rs. 25,000crore, during the last 3 years.
- Average annual net worth of more than Rs. 15,000crore, during the last 3 years.
- Average annual net profit after tax of more than Rs. 5,000crore, during the last 3 years.
- Should have significant global presence/international operations.

Source: TMH Ramesh Singh

**Q.9)** With reference to the "Hybrid Annuity Model (HAM)", which of the following statements is/are correct?

1. It is a mix of Build-Operate-Transfer (BOT) and Engineering, Procurement and Construction (EPC) models.
2. Under HAM 40% of the project cost is born by the government.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** In India, the new HAM is a mix of BOT Annuity and EPC models.

As per the design, the government will contribute to 40% of the project cost in the first five years through annual payments (annuity). The remaining payment will be made on the basis of the assets created and the performance of the developer.

Source: TMH Ramesh Singh

**PRELIMS MARATHON COMPILATION FOR THE MONTH OF MARCH 2021**

**Q.10)** Which of the following statements is/are correct about “India Infrastructure Finance Company Ltd (IIFCL)”?

1. It is jointly owned by Public sector and Private sector.
2. It provides long-term financial assistance to viable infrastructure projects.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** IIFCL is a wholly-owned Government of India Company set up in 2006 to provide long-term financial assistance to viable infrastructure projects through the Scheme for Financing Viable Infrastructure Projects through a Special Purpose Vehicle called India Infrastructure Finance Company Ltd (IIFCL), broadly referred to as SIFTI.

- The sectors eligible for financial assistance from IIFCL are as per the Harmonized list of Infrastructure Sub-Sectors as approved by the Government and as amended from time to time.
- These broadly include transportation, energy, water, and sanitation, and communication, social and commercial infrastructure.

Source: TMH Ramesh Singh

## *Intellectual Property Rights*

**Q.1)** Arrange the following conventions in chronological order of its establishment:

1. Paris Convention for the Protection of Industrial Property
2. World Intellectual Property Organization
3. Berne Convention for the Protection of Literary and Artistic Works

Select the correct answer using the codes given below:

- a) 1 – 2 – 3
- b) 1 – 3 – 2
- c) 3 – 1 – 2
- d) 3 – 2 – 1

**ANS: B**

**Explanation:** The importance of intellectual property was first recognized in the Paris Convention for the Protection of Industrial Property (1883) and the Berne Convention for the Protection of Literary and Artistic Works (1886).

Both treaties are administered by the World Intellectual Property Organization (WIPO) (1967).

Source: WIPO

**Q.2)** The validity time period of a patent in India is how many years?

- a) 5 years
- b) 10 years
- c) 20 years
- d) 30 years

**ANS: C**

**Explanation:** The term of every patent in India is twenty years from the date of filing the patent application, irrespective of whether it is filled with provisional or complete specification. However, in case of applications filed under the Patent Cooperative Treaty (PCT), the term of twenty years begins from the priority date.

Source: Sriram's IAS

**Q.3)** Which of the following is/are criteria for patentability?

1. It should be novel.
2. It should be capable of Industrial application.
3. It must be non-obvious.

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** An invention is patentable subject matter if it meets the following criteria –

- It should be novel.
- It should have inventive step or it must be non-obvious
- It should be capable of Industrial application.
- It should not attract the provisions of section 3 and 4 of the Patents Act 1970.

Source:

[https://ipindia.gov.in/writereaddata/Portal/Images/pdf/Final\\_FREQUENTLY\\_ASKED\\_QUESTIONS\\_-PATENT.pdf](https://ipindia.gov.in/writereaddata/Portal/Images/pdf/Final_FREQUENTLY_ASKED_QUESTIONS_-PATENT.pdf)

**Q.4)** Which of the following are can trademark in India?

1. Letter
2. Word
3. Number
4. Logo

Select the correct answer using the codes given below:

- a) 1, 2 and 3 only
- b) 2, 3 and 4 only
- c) 1, 2 and 4 only
- d) 1, 2, 3 and 4

**ANS: D**

**Explanation:** The process of brand trademark registration in India is now possible and convenient such that you can trademark any one of the below things or even a combination of the following:

- Letter
- Word
- Number
- Phrase
- Graphics
- Logo
- Sound Mark
- Smell or a mix of colors

Source: <https://cleartax.in/s/trademark-registration-procedure->

**Q.5)** “Madrid Agreement of 1881” is related to which of the following?

- a) Patents
- b) Industrial Designs
- c) Trade Marks
- d) All of the above

**ANS: C**

**Explanation:** Madrid Agreement, 1881 – Governs the international recognition of trademarks.

Source: Sriram’s IAS

**Q.6)** “Budapest Treaty of 1980” is related to which of the following?

- a) Plant varieties
- b) Micro – organisms
- c) Literary works
- d) Music albums

**ANS: B**

**Explanation:** Budapest Treaty of 1980 – It made possible patenting for micro-organisms. Claimant is required to deposit his invention on micro-organisms with an Authority – ‘International depository of Micro-Organisms’ under WIPO.

Source: Sriram’s IAS

**Q.7)** Which of the following way/ways to protect geographical indication?

1. Sui generis systems.
2. Using collective or certification marks.
3. Methods focusing on business practices, including administrative product approval schemes.

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** There are three main ways to protect a geographical indication:

- so-called sui generis systems (i.e. special regimes of protection);
- using collective or certification marks; and
- methods focusing on business practices, including administrative product approval schemes.

Source: Sriram's IAS

**Q.8)** With reference to the Traditional Knowledge Digital Library, which of the following statements is/are correct?

1. It is collaboration between private industry and CSIR.
2. It manages a database of knowledge that exists in various local languages.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** Traditional Knowledge Digital Library is a collaboration – between the Council of Scientific and Industrial Research (CSIR) and the Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (Dept. of AYUSH), Ministry of Health & Family Welfare, Government of India.

- It manages a database of knowledge that exists in various local languages such as Sanskrit, Urdu, Arabic, Persian and Tamil.
- TKDL has also converted the database into five international languages in patent application formats.
- So far, over 2lakh medicinal formulations have been transcribed and the database is present in 30 million A4-size pages.

Source: TKDL

**Q.9)** Consider the following statements regarding the Directorate General of Foreign Trade (DGFT) organization:

1. Its mandate is to formulating and implementing the Foreign Trade Policy with the main objective of promoting India's exports.
2. It is an attached office of the Ministry of Commerce and Industry.

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2

d) Neither 1 nor 2

**ANS: D**

**Explanation:** Directorate General of Foreign Trade (DGFT) organization is an attached office of the Ministry of Commerce and Industry and is headed by Director General of Foreign Trade.

- Right from its inception till 1991, when liberalization in the economic policies of the Government took place, this organization has been essentially involved in the regulation and promotion of foreign trade through regulation.
- Keeping in line with liberalization and globalization and the overall objective of increasing of exports, DGFT has since been assigned the role of “facilitator”.
- The shift was from prohibition and control of imports/exports to promotion and facilitation of exports/imports, keeping in view the interests of the country.
- This Directorate, with headquarters at New Delhi, is responsible for formulating and implementing the Foreign Trade Policy with the main objective of promoting India’s exports.
- The DGFT also issues scrips/authorization to exporters and monitors their corresponding obligations through a network of 38 regional offices and an extension counter at Indore.

Source: TMH Ramesh Singh

**Q.10)** Which of the following is/are correctly matched?

Committee/Panel	:	Significance
1. Ranga Rajan Committee	:	Balance of Payments
2. Vijay Kelkar Committee	:	Goods & Service Tax
3. Tarapore Committee	:	Currency Convertibility

Select the correct answer using the codes given below:

- a) 1, 2 and 3
- b) 2 and 3 only
- c) 1 and 2 only
- d) 1 only

**ANS: A**

**Explanation:** Besides, economic reforms in various sectors, various Committees were set up from time to time (by the Government of India and by RBI) to discuss policy issues related to international trade and balance of payments.

Some of the important Committees were –

- Committee on Export – Import Policies & Procedures (Alexander Committee, 1978),
- Committee on Trade policy (Abid Hussain Committee, 1984),
- High – level Committee on Balance of Payments (Rangarajan Committee 1993), and
- Committee on Capital Account Convertibility (Tarapore Committee I 1997 & Tarapore Committee II 2006).

In 2003, the Vajpayee government forms a task force under Vijay Kelkar to recommend tax reforms. In 2004, Vijay Kelkar, then advisor to the Finance Ministry, recommends GST to replace the existing tax regime.

Source: TMH Ramesh Singh

## Economic Survey 2020 – 2021

**Q.1)** Which of the following structural measures is/are taken as a part of Atmanirbhar Bharat Package?

1. Removal of artificial separation between manufacturing and service MSMEs.
2. Passing of Essential Commodities (Amendment) Act, 2020.
3. Enactment of four labour codes.

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** The Indian policymakers also recognized that the supply shock induced by the lockdown would disrupt the productive capacity of the economy. This capacity would need to be strengthened to meet the pent-up demand once it resumes – any mismatch would lead to macro-economic instabilities.

**Table 4: Major Structural Reforms Undertaken as a Part of Atmanirbhar Bharat Package**

Sector	Structural Reform Undertaken
<b>Deregulation and Liberalization of Sectors</b>	
Agriculture	<ul style="list-style-type: none"> <li>• Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020</li> <li>• Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Act, 2020</li> <li>• Essential Commodities (Amendment) Act, 2020</li> </ul>

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MSMEs	<ul style="list-style-type: none"> <li>• New MSME definition covering almost 99 per cent of all firms enabling MSMEs to grow in size and create jobs</li> <li>• Removal of artificial separation between manufacturing and service MSMEs</li> </ul>
Labour	<ul style="list-style-type: none"> <li>• Enactment of four labour codes namely, Wage Code, Industrial Relations Code, 2020, Code on Occupational Safety, Health &amp; Working Conditions Code, 2020 &amp; Social Security Code, 2020</li> <li>• 'One labour return, one licence and one registration'</li> </ul>
Business Process Outsourcing (BPO)	<ul style="list-style-type: none"> <li>• Simplification of the Other Service Provider (OSP) guidelines of the Department of Telecom. Several requirements, which prevented companies from adopting 'Work from Home' and 'Work from Anywhere' policies have been removed</li> </ul>
Power	<ul style="list-style-type: none"> <li>• Tariff Policy Reform: DISCOM inefficiencies not to burden consumers, Progressive reduction in cross subsidies, Time bound grant of open access, etc.</li> <li>• Privatization of Distribution in UTs</li> </ul>
PSUs	<ul style="list-style-type: none"> <li>• PSUs in only strategic sectors</li> <li>• Privatization of PSUs in non-strategic sectors</li> </ul>

Source: Economic Survey 2020 – 2021



**Q.2)** The Modigliani-Miller theorem is mentioned in economic survey 2020 – 2021 is related to which of the following?

- a) Capital Structure
- b) Insurance sector
- c) Fiscal policy
- d) All of the above

**ANS: A**

**Explanation:** The Modigliani-Miller theorem states that a company's capital structure is not a factor in its value.

- Market value is determined by the present value of future earnings, the theorem states.
- The theorem has been highly influential since it was introduced in the 1950s.

Source: Economic Survey 2020 – 2021

**Q.3)** Ricardian Equivalence Proposition (REP) is related to which of the following?

- a) Government spending
- b) Minting new currency
- c) Monetary policy framework
- d) International Trade

**ANS: A**

**Explanation:** Ricardian equivalence is an economic theory that says that financing government spending out of current taxes or future taxes (and current deficits) will have equivalent effects on the overall economy.

This means that attempts to stimulate an economy by increasing debt-financed government spending will not be effective because investors and consumers understand that the debt will eventually have to be paid for in the form of future taxes.

Source: Economic Survey 2020 – 2021

**Q.4)** Which of the following scheme/schemes is/are Central Sector Scheme for Agriculture Sector?

1. Formation and promotion of Farmer Producer Organizations (FPOs).
2. Pradhan Mantri Fasal Bima Yojana.
3. Pradhan Mantri Kisan Samman Nidhi (Pm-Kisan).

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 1 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** Pradhan Mantri Kisan Samman Nidhi (Pm-Kisan) is a Central Sector Scheme. It provides income support to all small and marginal landholding farmer families having cultivable land.

- PM Fasal Bima Yojana is a centrally sponsored scheme and it replaced all other existing insurance schemes except the Restructured Weather-Based Crop Insurance Scheme.
- Formation and Promotion of Farmer Producer Organizations (FPOs) is a Central Sector Scheme under Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW).

**PRELIMS MARATHON COMPILATION FOR THE MONTH OF MARCH 2021**

Source: Economic Survey 2020 – 2021

**Q.5)** Consider the following statements regarding the Pradhan Mantri Matsya Sampada Yojana (PMMSY):

1. It will be implemented over a period of 5 years from FY 2020-21 to FY 2024-25 in all coastal States/Union Territories.
2. More than 50% of the total estimated investment of the PMMSY is earmarked for creation and up-gradation of fisheries infrastructure facilities.
3. The scheme plans to reduce post-harvest losses from the present high of 25% to about 10% by modernizing and strengthening value chain.

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 3 only

**ANS: D**

**Explanation:** The Pradhan Mantri Matsya Sampada Yojana (PMMSY) aims to enhance fish production to 220 lakh metric tons by 2024-25 from 137.58 lakh metric tons in 2018-19 at an average annual growth rate of about 9%.

- The Union Minister for Fisheries, Animal Husbandry and Dairying, Shri Giriraj Singh, said the ambitious scheme will result in doubling export earnings to Rs.1,00,000 crore and generate about 55 lakhs direct and indirect employment opportunities in fisheries sector over a period of next five years.
- Dedicating the PMMSY to fishers, fish farmers, fish workers, fish vendors and other stakeholders associated with the fisheries sector, Shri Giriraj Singh said that insurance coverage for fishing vessels is being introduced for the first time.
- The PMMSY will be implemented over a period of 5 years from FY 2020-21 to FY 2024-25 in all States/Union Territories.
- The Fisheries Minister said that about 42% of the total estimated investment of the PMMSY is earmarked for creation and upgradation of fisheries infrastructure facilities.
- Focus areas include Fishing Harbours and Landing Centers, Post-harvest and Cold Chain Infrastructure, Fish Markets and Marketing Infrastructure, Integrated Modern Coastal Fishing Villages and Development of Deep-sea Fishing.
- Besides creating critical fisheries infrastructure by attracting private investments in fisheries sector, the scheme plans to reduce post-harvest losses from the present high of 25% to about 10% by modernizing and strengthening value chain.
- Under the Swath Sagar plan, activities envisaged with a view to modernize the fisheries sector include promotion of Bio-toilets, Insurance coverage for fishing vessels, Fisheries Management Plans, E-Trading/Marketing, Fishers and resources survey and creation of National IT-based databases.

Source: The Hindu

**Q.6)** The term “Crowding out Effect”, often seen news, is related to which of the following?

- a) Rise in individual borrowings
- b) Rise in foreign investment
- c) Rise in borrowing of government
- d) Rise in high powered money

**ANS: C**

**Explanation:** In some situations, such as high budget deficit etc, there is rise in government borrowing from the market.

- Due to the excessive borrowing by the government from the market, there is little credit left for private sector to borrow.
- As a result, interest rate rises, making borrowings by private sector costly and leading to decline in private investment. This is known as crowding out effect.
- The private borrowing and subsequent private investment is discouraged.

Source: Economic Survey 2020 – 2021

**Q.7)** With reference to the India’s public debt – to – GDP, which of the following statements is/are correct?

1. India’s overall debt levels as a per cent of GDP are the lowest amongst the group of G-20 countries.
  2. Government debt – to – GDP is more than Private debt – to – GDP.
- Select the correct answer using the codes given below:

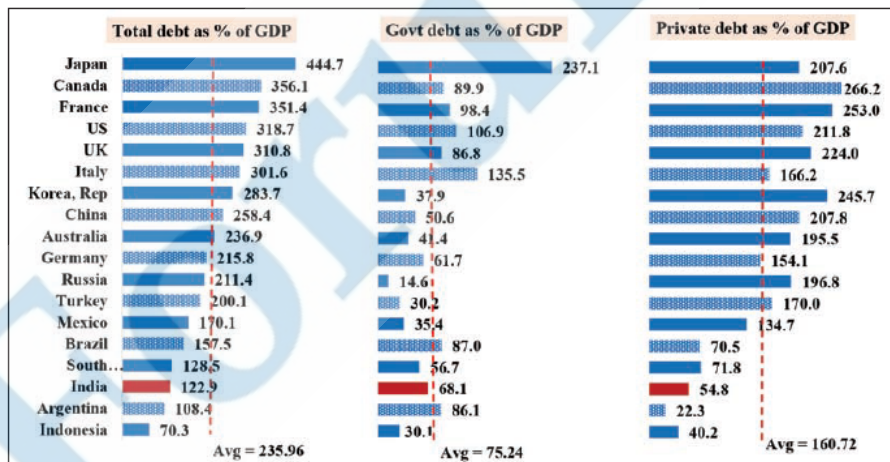
- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** A cross-country comparison of debt levels points out that for India, the government debt level as a proportion of GDP is equal to the median in the group of G-20 OECD countries and in the group of BRICS nations.

India’s overall debt levels as a per cent of GDP are the lowest amongst the group of G-20 OECD countries and also among the group of BRICS nations.

**Figure 17: Debt-to-GDP ratio for India amongst the Rest of the world (2018)**



Source: IMF Debt database

Source: Economic Survey 2020 – 2021

**Q.8)** According to Moody’s India’s Sovereign credit rating is Baa3 in June 2020. Baa3 is means?

- a) High quality rating
- b) Strong Payment capacity
- c) High risk obligations
- d) Adequate payment capacity

**ANS: D**

**Explanation:** Sovereign credit ratings seek to quantify issuers' ability to meet debt obligations. When favourable, these can facilitate countries access to global capital markets and foreign investment.

Interpretation	Fitch and S&P	Moody's
Highest quality	AAA	Aaa
High quality	AA+	Aa1
	AA	Aa2
	AA-	Aa3
Strong payment capacity	A+	A1
	A	A2
	A-	A3
Adequate payment capacity	BBB+	Baa1
	BBB	Baa2
	BBB-	Baa3
Likely to fulfill obligations, on going uncertainty	BB+	Ba1
	BB	Ba2
	BB-	Ba3
High-risk obligations	B+	B1
	B	B2
	B-	B3
Vulnerable to default	CCC+	Caa1
	CCC	Caa2
	CCC-	Caa3
Near or in bankruptcy or default	CC	Ca
	C	C
	D	D

Source: IMF (2010)

Source: Economic Survey 2020 – 2021

**Q.9)** Consider the following statements regarding “Social Progress Index”:

1. It is compiled and released by World Economic Forum.
2. The index is based on three dimensions of social progress, basic Human Needs, foundations of Wellbeing, and opportunity.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The (“SPI”), compiled by the Social Progress Imperative, a US-based non-profit, ranks 149 countries' social performance over six years (2014-2019).

- It uses 51 indicators including: nutrition, shelter, safety, education, health, personal rights and inclusiveness.
- The Social Progress Index is the first holistic measure of a country's social performance that is independent of economic factors.
- The index is based on a range of social and environmental indicators that capture three dimensions of social progress: Basic Human Needs, Foundations of Wellbeing, and Opportunity.
- The index captures outcomes related to all 17 Sustainable Development Goals and is a comprehensive snapshot of a country's overall progress towards the achievement of the goals.

Source: TMH Ramesh Singh

**PRELIMS MARATHON COMPILATION FOR THE MONTH OF MARCH 2021**

**Q.10)** “It is an economic situation where people hoard financial capital instead of investing or spending it”- is related to which of the following?

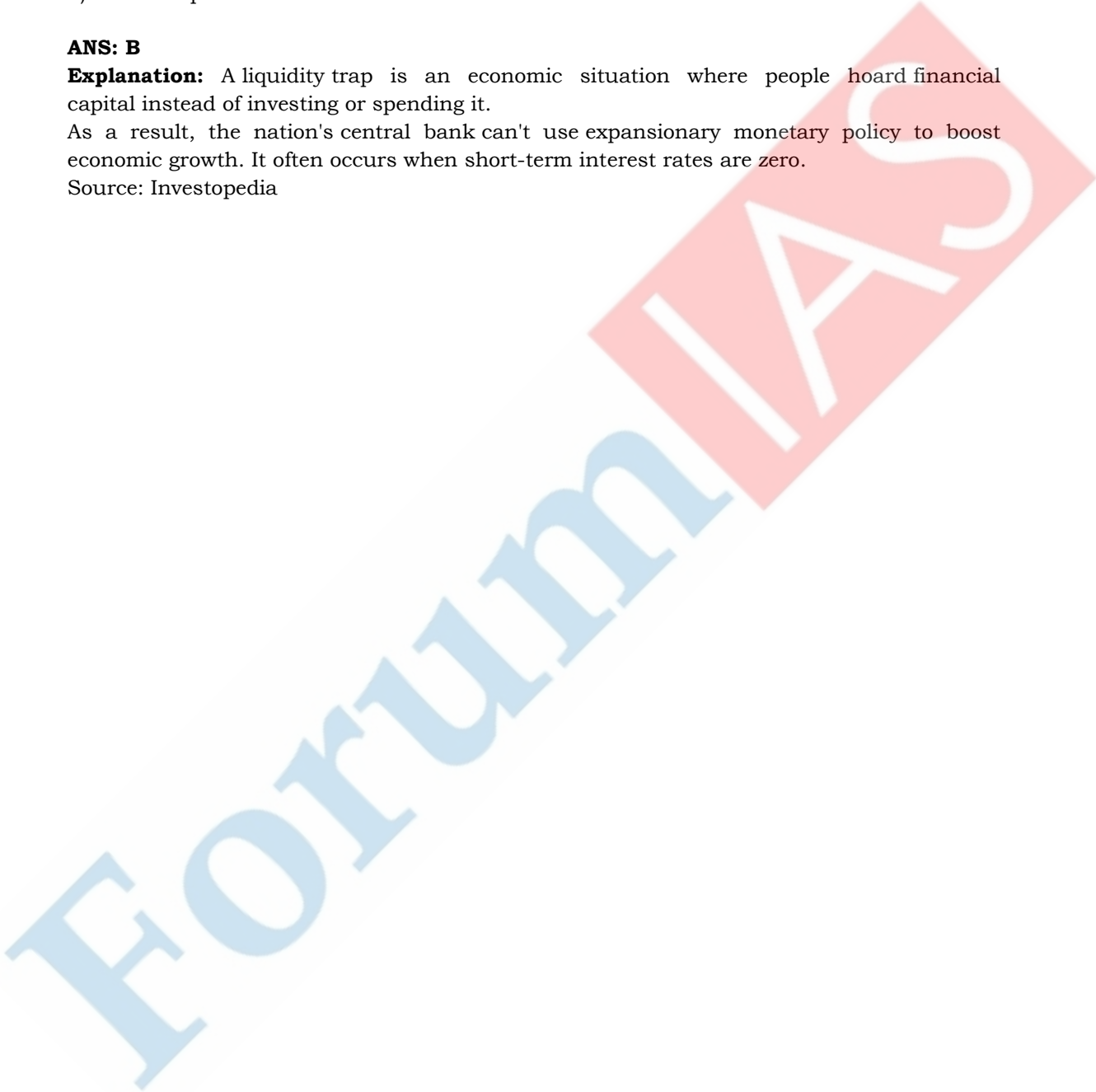
- a) Multiplier effect
- b) Liquidity trap
- c) Thrift
- d) Fiscal trap

**ANS: B**

**Explanation:** A liquidity trap is an economic situation where people hoard financial capital instead of investing or spending it.

As a result, the nation's central bank can't use expansionary monetary policy to boost economic growth. It often occurs when short-term interest rates are zero.

Source: Investopedia



## Economic Survey 2020 – 2021 and Reports

- Q.1)** Consider the following statements regarding the entrepreneurship ecosystem in India:
1. India has the 3rd largest entrepreneurship ecosystem in the world.
  2. The level of education and the quality of physical infrastructure will influence entrepreneurship ecosystem.

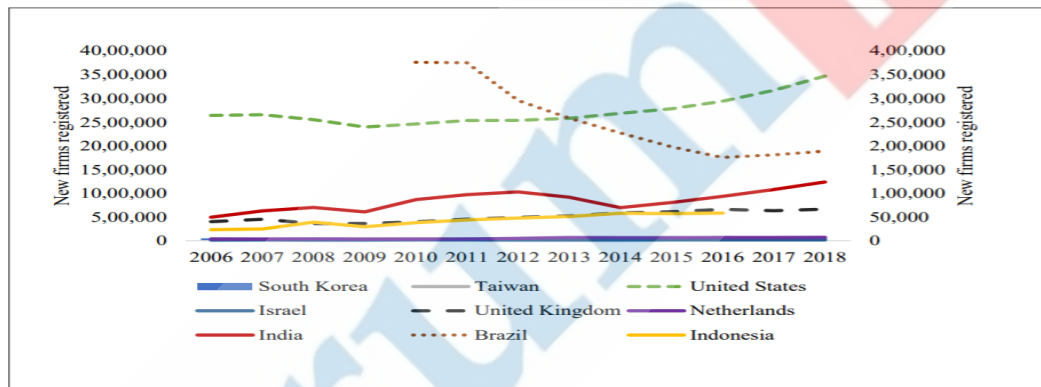
Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The chart clearly establishes that India has the 3rd largest entrepreneurship ecosystem in the world.

**Figure 1: Comparison of entrepreneurial activity (new firms) across countries**



Source: World Bank's EODB Entrepreneurship Data, Business Formation Statistics of the U.S. Census Bureau and Survey Calculations

Note: Secondary axis for India, Brazil and, Indonesia

Literacy, education, physical infrastructure are the key areas that will foster entrepreneurship and thereby job creation and wealth creation.

Source: Economic Survey

- Q.2)** Consider the following statements regarding the Creative destruction:
1. It refers to the incessant product and process innovation mechanism by which new production units replace outdated ones.
  2. It was coined by Joseph Schumpeter.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Creative destruction refers to the incessant product and process innovation mechanism by which new production units replace outdated ones.

- This restructuring process permeates major aspects of macroeconomic performance, not only long-run growth but also economic fluctuations, structural adjustment and the functioning of factor markets.
- Over the long run, the process of creative destruction accounts for over 50 per cent of productivity growth.
- At business cycle frequency, restructuring typically declines during recessions, and this adds a significant cost to downturns.
- Obstacles to the process of creative destruction can have severe short- and long-run macroeconomic consequences.
- It was coined by Joseph Schumpeter (1942), who considered it 'the essential fact about capitalism'.

Source: Economic Survey

**Q.3)** The Economic Freedom of the World report is released by which of the following?

- a) Fraser Institute
- b) World Economic Forum
- c) World Trade Organization
- d) The Heritage Foundation

**ANS: A**

**Explanation:** The Fraser Institute produces the annual Economic Freedom of the World report in cooperation with the Economic Freedom Network, a group of independent research and educational institutes in nearly 100 countries and territories.

It's the world's premier measurement of economic freedom, measuring and ranking countries in five areas:

- size of the government,
- legal structure and security of property rights,
- access to sound money,
- freedom to trade internationally and regulation of credit,
- labour and business.

Source: The Hindu

**Q.4)** Consider the following statements regarding the National List of Essential Medicines (NLEM):

1. The first National List of Essential Medicines of India was prepared and released in 1976.
2. The list is prepared by Ministry of Health and Family Welfare.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The National list of essential medicines is one of the key instruments in a balanced healthcare delivery system of a country which inter alia includes accessible, affordable quality medicine at all the primary, secondary, tertiary levels of healthcare.

- The first National List of Essential Medicines of India was prepared and released in 1976.

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- The National List of Essential Medicines (NLEM), prepared by Ministry of Health and Family Welfare, is a list of medicines considered essential and high priority for India's health needs.
- DPCOs are issued by the Government, in exercise of the powers conferred under section 3 of the ECA to ensure that the medicines listed under NLEM are available at a reasonable price to the general public.

Source: The Hindu

**Q.5)** Consider the following statements regarding the Gross Fixed Capital Formation:

1. There is a continuous decline in Gross Fixed Capital Formation in India from 2008 to 2018.
2. The World Bank tracks gross capital formation, which it defines as outlays on additions to fixed assets and excludes net changes in Inventories.

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

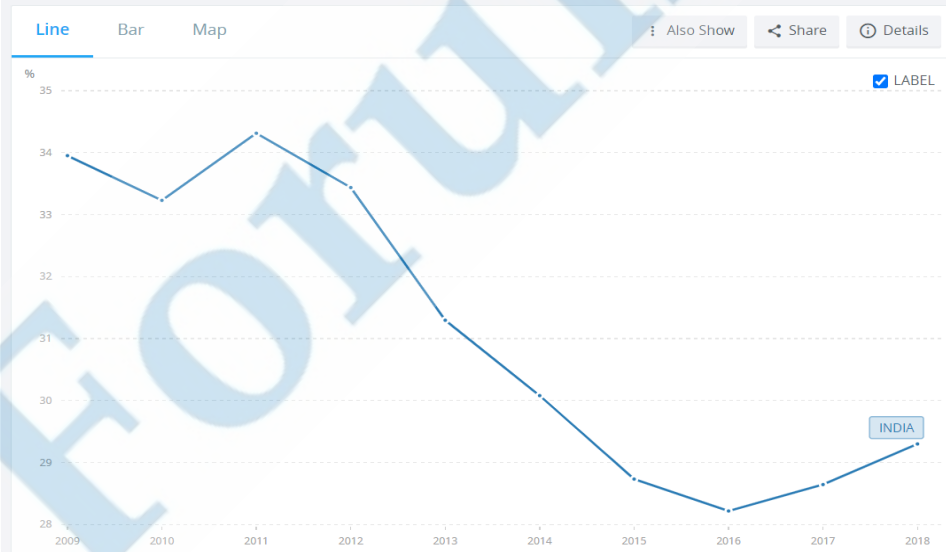
**Explanation:** Capital formation is a term used to describe the net capital accumulation during an accounting period for a particular country. The term refers to additions of capital goods, such as equipment, tools, transportation assets, and electricity.

GFCF in India is not following a particular trend in last 12 years.

### Gross fixed capital formation (% of GDP) - India

World Bank national accounts data, and OECD National Accounts data files.

License: CC BY-4.0



Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.

- Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases;
- And the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.



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- Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and work in progress. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation.

Source: Economic Survey

**Q.6)** The term “Smurfing” is related to which of the following?

- a) Ransomware
- b) Money laundering
- c) Round tripping
- d) Cyber attack

**ANS: B**

**Explanation:** Smurfing (also called structuring) is a method in which small sizes of money is kept in several number of bank accounts to hide the real identity of the real owner.

- This has been a very commonly used method of money-laundering.
- During the reform period, as more prudential norms of banking regulation evolved, such acts declined in India.

‘Smurfer’ (or ‘money mule’) is a person who does this.

Source: TMH Ramesh Singh

**Q.7)** The Export-Import Bank of India (EXIM) extends Lines of Credit (LOCs) to promote export and imports. Which of the following is/are eligible for EXIM Lines of Credits?

1. Overseas financial institutions
2. Regional development banks
3. Sovereign governments

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** Export-Import Bank of India (EXIM Bank) is a specialized financial institution, wholly owned by Government of India, set up in 1982, for financing, facilitating and promoting foreign trade of India.

EXIM Bank extends Lines of Credit (LOCs) to

- overseas financial institutions,
- regional development banks,
- sovereign governments and
- other entities overseas,

to enable buyers in those countries to import developmental and infrastructure projects, equipments, goods and services from India, on deferred credit terms.

Source: EXIM

**Q.8)** The “Operation Twist” often seen in news is related to which of the following?

- a) Buy Buying foreign assets
- b) Foreign trade
- c) Lines of Credit
- d) Buy and sale of government securities

**ANS: D**

**Explanation:** The Reserve Bank of India (RBI) will simultaneously buy and sale government securities worth ₹10,000 crore each in December 2019 under its open market operations — a move aimed at managing the yields.

- The RBI will purchase the longer-term maturities, that are trading at a spread of 150 bps (basis points) over the repo rate, so that the yield of these papers will soften and sell the shorter duration ones.
- The central bank said it will buy ₹10,000 crore of 6.45% government bonds maturing in 2029 and simultaneously sell ₹10,000 crore of short-term bonds maturing in 2020.
- Operation Twist is a move taken by U.S. Federal Reserve in 2011-12 to make long-term borrowing cheaper.

Source: The Hindu

**Q.9)** The Protected Special Agricultural Zone (PSAZ), sometimes seen in news is related to which of the following state?

- a) Andhra Pradesh
- b) Tamil Nadu
- c) Kerala
- d) Uttar Pradesh

**ANS: B**

**Explanation:** The Tamil Nadu Government has introduced a Bill in the Legislative Assembly seeking to declare the Cauvery delta region a Protected Special Agriculture Zone (PSAZ).

- The Bill said, since certain non-farming activities were adversely affecting agriculture in the region, threatening the State's food security, "to protect the agriculture in this region, it is proposed to prohibit certain activities in the region."
- The Bill also sought to establish a 30-member Tamil Nadu Protected Agricultural Zone Authority headed by the Chief Minister to advise the government on various measures to protect and improve farming activities to increase farm production and farm productivity to serve the interest of farmers.
- The proposed PSAZ would comprise of Thanjavur, Tiruvarur and Nagapattinam districts and five blocks each in Cuddalore and Pudukkottai districts.
- These areas have been listed under the First Schedule of the Act, to which the government may add or omit any area in the future.
- The government has identified zinc smelter; iron ore process plants, copper smelter, aluminum smelter, tannery, and ship breaking industries among others as industries that adversely affect agriculture developments in the PSAZ. This list in the Second Schedule of the Act too, is subject to omission and addition subsequently.

Source: The Hindu

**Q.10)** Which of the following crops are monitored under Market Intelligence and Early Warning System (MIEWS) Portal?

1. Sugar cane
2. Onions
3. Pulses
4. Tomato
5. Potato

Select the correct answer using the code given below:

- a) 2, 4 and 5 only

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- b) 2, 3, 4 and 5 only
- c) 1, 2, 3, 4 and 5
- d) 1, 2, 4 and 5 only

**ANS: A**

**Explanation:** The MIEWS Dashboard and Portal is a 'first-of-its-kind' platform for 'real time monitoring' of prices of tomato, onion and potato (TOP) and for simultaneously generating alerts for intervention under the terms of the Operation Greens (OG) scheme.

- This portal is a novel initiative of MoFPI leveraging IT tools and furthering the goals of Digital India.
- The portal would disseminate all relevant information related to TOP crops such as Prices and Arrivals, Area, Yield and Production, Imports and Exports, Crop Calendars, Crop Agronomy, etc in an easy to use visual format.

Source: Sriram's IAS

## Science

**Q.1)** The term “SODAR” is related to which of the following?

- a) Ocean Depth
- b) River erosion
- c) Wind speed
- d) None

**ANS: C**

**Explanation:** As the wind energy industry expands and larger-scale projects are developed, wind turbines are becoming larger in rotor diameter as well as in hub height.

- Accordingly it is becoming difficult to accurately assess the wind resource with standard cup anemometers mounted on standard height (60m) meteorological (met) towers.
- For this reason, attention is being directed to other methods of wind speed measurement, such as SODAR (Sonic Detection and Ranging).
- Since the SODAR can measure wind speed as a function of height and is relatively easy to transport and assemble, the technology is very appealing.

Source: NCERT

**Q.2)** Which of the following event/events produces the “Gravitational Waves”?

- 1. Colliding black holes.
- 2. Massive stars exploding at the end of their lifetimes.
- 3. Colliding neutron stars.

Select the correct answer using the codes given below:

- a) 1, 2 and 3
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1 and 2 only

**ANS: A**

**Explanation:** The strongest gravitational waves are produced by cataclysmic events such as colliding black holes, supernovae (massive stars exploding at the end of their lifetimes), and colliding neutron stars.

Other waves are predicted to be caused by the rotation of neutron stars that are not perfect spheres, and possibly even the remnants of gravitational radiation created by the Big Bang.

Source: NCERT

**Q.3)** Which of the following statements is/are correct about “Sublimation”?

- 1. It is a process in which solids directly change to gases.
- 2. Camphor is an example of solids that undergo sublimation.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The process in which solids directly change to gases is known as sublimation.

- This occurs when solids absorb enough energy to completely overcome the forces of attraction between them.
- Dry ice and Camphor are examples of solids that undergo sublimation.

Source: NCERT

**Q.4)** Which of the following statements is/are correct about “Oxides of Nitrogen”?

1. Nitrous oxide is a white colour gas with a mild, pleasant odour and a sweet taste is used as an anesthetic for minor operations.
2. Nitric oxide is one of the environmental pollutants generated by internal-combustion engines.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** Nitrogen (N) forms oxides in which nitrogen exhibits each of its positive oxidation numbers from +1 to +5. Nitrous oxide (dinitrogen oxide),  $N_2O$ , is formed when ammonium nitrate,  $NH_4NO_3$ , is heated.

- This oxide, which is a colourless gas with a mild, pleasant odour and a sweet taste, is used as an anesthetic for minor operations, especially in dentistry.
- It is called laughing gas because of its intoxicating effect. It is also widely used as a propellant in aerosol cans of whipped cream.
- Gaseous nitric oxide is the most thermally stable oxide of nitrogen and is also the simplest known thermally stable paramagnetic molecule—i.e., a molecule with an unpaired electron.
- It is one of the environmental pollutants generated by internal-combustion engines, resulting from the reaction of nitrogen and oxygen in the air during the combustion process.

Source: NCERT

**Q.5)** Which of the following statements is/are correct about “Styrene”?

1. It is primarily a synthetic material and easily dissolves in water.
2. It is used in making plastics, paints, automobile parts, food containers and disposal cups.
3. Low levels of styrene also occur naturally in a variety of foods such as fruits, vegetables, nuts, beverages, and meats.

Select the correct answer using the codes given below:

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** Styrene is primarily a synthetic chemical. It is also known as vinyl benzene, ethenyl benzene, cinnamene, or phenyl ethylene.

- It's a colorless liquid that evaporates easily and has a sweet smell. It often contains other chemicals that give it a sharp, unpleasant smell.

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- It dissolves in some liquids but doesn't dissolve easily in water. Billions of pounds are produced each year to make products such as rubber, plastic, insulation, fiberglass, pipes, automobile parts, food containers, and carpet backing.
- Most of these products contain styrene linked together in a long chain (polystyrene) as well as unlinked styrene.
- Low levels of styrene also occur naturally in a variety of foods such as fruits, vegetables, nuts, beverages, and meats.

Source: The Hindu

**Q.6)** Which of the following statements is/are correct about “Lithium”?

1. Lithium along with Hydrogen and Helium are the only elements created at the birth of the Universe.
2. Lithium salts were the first drugs approved by the Food and Drug Administration to treat mania and depression.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The only chemical elements created at the beginning of our universe were hydrogen, helium and lithium, the three lightest atoms in the periodic table. These elements were formed throughout the universe as a hot gas.

- Lithium makes up a mere 0.0007 percent of the Earth's crust, according to the Jefferson Lab of USA, and it's only found locked up in minerals and salts.
- Those salts have the power to change the brain: Lithium salts were the first drugs approved by the Food and Drug Administration to treat mania and depression, according to the National Institute of Mental Health.

Source: NCERT

**Q.7)** Which of the following statements is/are correct about “Arthropod”?

1. They are the smallest animal phylum-about 0.5% of all known animals in the world is part of this class.
2. Arthropods are warm blooded animals.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** Arthropods are everywhere and are the largest animal phylum -- about 85% of all known animals in the world are part of this class.

- There are far more species of arthropods than there are species in all the other phylum's (phyla) combined.
- They are spiders, insects, centipedes, mites, ticks, lobsters, crabs, shrimp, crayfish, krill, barnacles, scorpions and many, many others.
- Arthropods are cold blooded -- which means, their body temperature depends on the temperature of the environment surrounding them.

Source: The Hindu

**Q.8)** Which of the following micro-organism/s is/are “unicellular”?

1. Bacteria
2. Fungi
3. Protozoa

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** Unicellular Organisms.

- Bacteria are tiny, single-celled organisms that get nutrients from their environments.
- Fungi live as either single-celled organisms or multi-cellular organisms. Single-celled fungi are referred to as yeasts. The vast majority of fungi are multi-cellular. A fungus gets nutrition from plants, food, and animals in damp, warm environments.
- Protozoa are one-celled organisms, like bacteria. But they are bigger than bacteria and contain a nucleus and other cell structures, making them more like plant and animal cells.

Source: NCERT

**Q.9)** The polarimetry technique is recently in news is related to which of the following?

- a) Optical activity
- b) Measuring ozone
- c) Electricity measurement
- d) Pollen Carbon Dating method

**ANS: A**

**Explanation:** Polarimetry is a sensitive, nondestructive technique for measuring the optical activity exhibited by inorganic and organic compounds.

- A compound is considered to be optically active if linearly polarized light is rotated when passing through it.
- A team of astronomers has discovered that the closest known brown dwarf, Luhman 16A, shows signs of cloud bands similar to those seen on Jupiter and Saturn.
- The researchers used an instrument on the Very Large Telescope in Chile to study polarised light from the Luhman 16 system. Polarisation is a property of light that represents the direction that the light wave oscillates.
- The polarimetry technique is not limited to brown dwarfs. It can also be applied to exoplanets orbiting distant stars. The atmospheres of hot, gas giant exoplanets are similar to those of brown dwarfs.

Source: The Hindu

**Q.10)** Consider the following statements regarding the Black Hole:

1. A black hole is a place in space where gravity pulls so much that even light cannot get out.
2. The super-massive black hole at the center of the Milky Way galaxy is called Sagittarius A.
3. The Sun is not a big enough star to make a black hole.

Which of the statements given above is/are correct?

- a) 1 only

- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** A black hole is a place in space where gravity pulls so much that even light cannot get out. The gravity is so strong because matter has been squeezed into a tiny space. This can happen when a star is dying.

- The largest black holes are called "supermassive." These black holes have masses that are more than 1 million suns together. Scientists have found proof that every large galaxy contains a supermassive black hole at its center.
- The supermassive black hole at the center of the Milky Way galaxy is called Sagittarius A. It has a mass equal to about 4 million suns and would fit inside a very large ball that could hold a few million Earths.
- Even if a black hole the same mass as the sun were to take the place of the sun, Earth still would not fall in.
- The black hole would have the same gravity as the sun. Earth and the other planets would orbit the black hole as they orbit the sun now.
- The sun will never turn into a black hole. The sun is not a big enough star to make a black hole.

Source: NCERT and The Hindu



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## Science

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**Q.1)** Consider the following statements regarding the Aerosols:

1. They are minute particles suspended in the atmosphere.
  2. Cold climate with dry periods decreases the concentration of Aerosols in the Atmosphere.
- Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** Aerosols are minute particles suspended in the atmosphere. When these particles are sufficiently large, we notice their presence as they scatter and absorb sunlight.

- Their scattering of sunlight can reduce visibility (haze) and redden sunrises and sunsets. Aerosols interact both directly and indirectly with the Earth's radiation budget and climate.
- As a direct effect, the aerosols scatter sunlight directly back into space.
- As an indirect effect, aerosols in the lower atmosphere can modify the size of cloud particles, changing how the clouds reflect and absorb sunlight, thereby affecting the Earth's energy budget
- Aerosols come from both natural and human sources—and sometimes both at once. Dust, for example, is scoured from deserts, the dried-out edges of rivers, dry lakebeds, and more.
- Its concentrations in the atmosphere rise and fall with climate; in cold, dry, periods in the planet's history like the last ice age, more dust filled the atmosphere than during warmer stretches of Earth's history.

Source: NCERT and The Hindu

**Q.2)** Consider the following statements regarding the nucleotide of DNA:

1. It is made up of three parts consists of phosphate group, a 5-carbon sugar, and a nitrogenous base.
  2. The four nitrogenous bases in DNA are adenine, cytosine, guanine, and uracil.
- Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** A nucleotide is an organic molecule that is the building block of DNA and RNA.

- They also have functions related to cell signaling, metabolism, and enzyme reactions.
- A nucleotide is made up of three parts: a phosphate group, a 5-carbon sugar, and a nitrogenous base.
- The four nitrogenous bases in DNA are adenine, cytosine, guanine, and thymine.
- RNA contains uracil, instead of thymine.

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- A nucleotide within a chain makes up the genetic material of all known living things.
- They also serve a number of functions outside of genetic information storage, as messengers and energy moving molecules.

Source: NCERT and The Hindu

**Q.3)** Hydro-dynamic trapping, Solubility trapping and Mineral trapping is related to which of the following?

- a) Carbon sequestration
- b) Deep sea mineral exploration
- c) Shale gas exploration
- d) Bio-diesel extraction

**ANS: A**

**Explanation:** In recent years, fundamental research has focused increasingly on the short and long term effects of CO<sub>2</sub> injection into reservoirs to assess the feasibility of **CO<sub>2</sub> storage** on a commercial scale.

- Sequestration processes involve different trapping mechanisms according to the hydrodynamic, physical and chemical conditions in the formation.
- It is common to divide these mechanisms into four different categories: hydrodynamic trapping, residual trapping, solubility trapping, and mineral trapping.

Source: Indian Express

**Q.4)** Consider the following statements regarding the composite materials:

1. A composite material is a combination of two materials with different physical and chemical properties.
2. They are used in the development of Agni missile and Light Combat Aircraft (Tejas).

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** A composite material is a combination of two materials with different physical and chemical properties.

- When they are combined they create a material which is specialised to do a certain job, for instance to become stronger, lighter or resistant to electricity.
- They can also improve strength and stiffness.
- The reason for their use over traditional materials is because they improve the properties of their base materials and are applicable in many situations.
- Use of composite materials in indigenously developed aircraft (Tejas), missiles (Agni) and in defense and civilian sectors is poised for big growth, where Indian companies are set to get into manufacturing mode.

Source: NCERT and The Hindu

**Q.5)** Consider the following statements regarding the Neutrino:

1. The neutrino is a tiny elementary particle which is part of the atom.
2. Neutrino has a very tiny mass and with electrical charge.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only

- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** Proton, neutron, and electron are tiny particles that make up atoms.

- The neutrino is also a tiny elementary particle, but it is not part of the atom. Such particles are also found to exist in nature.
- Neutrino has a very tiny mass and no charge. It interacts very weakly with other matter particles.
- So weakly that every second trillions of neutrinos fall on us and pass through our bodies unnoticed.
- Neutrinos come from the sun (solar neutrinos) and other stars, cosmic rays that come from beyond the solar system, and from the Big Bang from which our Universe originated.
- They can also be produced in the lab.

Source: The Hindu

**Q.6)** The “Founder effect” is related to which of the following?

- a) Genetic drift
- b) Periodic table
- c) Geographical discoveries
- d) Chemical bonding

**ANS: A**

**Explanation:** Genetic drift can have major effects when a population is sharply reduced in size by a natural disaster (bottleneck effect) or when a small group splits off from the main population to found a colony (founder effect).

- The founder effect is another extreme example of drift, one that occurs when a small group of individuals breaks off from a larger population to establish a colony.
- The new colony is isolated from the original population, and the founding individuals may not represent the full genetic diversity of the original population.
- That is, alleles in the founding population may be present at different frequencies than in the original population, and some alleles may be missing altogether.
- The founder effect is similar in concept to the bottleneck effect, but it occurs via a different mechanism (colonization rather than catastrophe).
- Genetic studies done on the people of the Lakshwadeep archipelago by a team, led by K. Thangaraj at CSIR-Centre for Cellular and Molecular Biology (CCMB), for the first time have shown that a majority of human ancestry in Lakshadweep is largely derived from South Asia with minor influences from East and West Eurasia.
- And, there was no evidence of early human migration through the Lakshadweep islands.
- “We found a strong founder effect for both paternal and maternal lineages — a sign that the island population had limited genetic mixing”, said by scientists.

Source: The Hindu & NCERT

**Q.7)** Which of the following statements regarding the periodic table is/are correct?

1. It was first designed by Dmitri Ivanovich Mendeleev.
2. United Nations announced 2019 as the International Year of the Periodic Table.

Select the correct answer using the code given below:

- a) 1 only
- b) 2 only

- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The United Nations announced 2019 as the International Year of the Periodic Table of the Chemical Elements to highlight its first publication in 1869.

- The periodic table as we know it today was first designed by the Russian scientist Dmitri Ivanovich Mendeleev.
- This year marks the 150th anniversary of the first publication of the periodic table by Mendeleev.
- Since its creation, the periodic table has been at the centre of a lot of vivid debates and is now considered as “one of the most important and influential achievements in modern science reflecting the essence not only of chemistry, but also of physics, biology and other disciplines.”
- Mendeleev’s genius lies in the acknowledgement that at the time, not all the elements were known yet, so he left gaps in the table for undiscovered elements.
- At that time, only 63 elements had been identified. Still the properties of five other elements (the gaps brilliantly added to complete the table) could already been determined using the table.

Source: NCERT

**Q.8)** Bats serve as natural hosts for numerous viruses including Ebola virus, Nipah virus and corona viruses, but they rarely effected by these viruses. What would be the appropriate reason?

- a) Bats can avoid excessive virus-induced inflammation.
- b) Bats are mostly nocturnal.
- c) These viruses use bats as host and don’t affect the bats.
- d) Due to no impaired production of mRNA (transcript) in bats.

**ANS: A**

**Explanation:** Bats serves as natural hosts for numerous viruses including Ebola virus, Nipah virus, corona viruses such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) and the 2019 novel corona virus that has infected nearly 10,000 people and killed over 200 others.

- Even as these viruses cause harm in humans, they rarely if at all cause any harmful effects in bats. This is the case even when the viral load is extremely high in bats.
- The reason why bats can harbour these viruses without getting affected is simply because bats can avoid excessive virus-induced inflammation, which often causes severe diseases in animals and people infected with viruses.
- The researchers found that significantly reduced inflammation in bats was because activation of an important protein — NLRP3 — that recognises both cellular stress and viral/bacterial infections was significantly dampened in bat immune cells.
- Studying further, the researchers found that reduced activation of the NLRP3 protein was in turn due to impaired production of mRNA (transcript).
- Since mRNA production is impaired the NLRP3 protein production gets compromised leading to less amount of the protein being produced.
- But this was not the case with mice and humans — there was no impairment to mRNA production so the NLRP3 protein was unaffected.

Source: The Hindu

**Q.9)** The maximum residue limit (MRL) is sometimes seen in news is related to which of the following?

- a) Pesticides level
- b) Pollution level
- c) Water toxicity
- d) Crude exploration

**ANS: A**

**Explanation:** The traces pesticides leave in treated products or those left by veterinary drugs in animals are called "residues".

- The traces pesticides leave in treated products or those left by veterinary drugs in animals are called "residues".
- A study of fruits and vegetables grown in the Nilgiris has found that some of the produce might be harbouring high levels of pesticide, beyond what is considered advisable. This was mainly true of potato and carrot.
- While the Food Safety and Standards Authority of India (FSSAI) prescribes a maximum residual level (MRL) for some of the organophosphate pesticides used, it does not prescribe it for some other pesticides used in the cultivation of fruit and vegetables.

Source: NCERT

**Q.10)** The terms "Rani Rashmoni, Rani Abbakka, Rani Avanti Bai, Rani Durgavati and Rani Gaidinliu" often seen in news is related to which of the following?

- a) Deep sea research vessels
- b) Patrolling vessels
- c) Corvettes
- d) Diesel submarines

**ANS: B**

**Explanation:** Rani Rashmoni is a fast patrol vessel, indigenously built by Hindustan Shipyard.

- It is built under the Fast Patrol Vessel (FPV) project of Indian Coast Guard.
- Under the first phase of the project, 5 FPV's has been built.
- The first four such ships are ICGS Rani Abbakka, ICGS Rani Avanti Bai, ICGS Rani Durgavati and ICGS Rani Gaidinliu.

Source: The Hindu

## Science

**Q.1)** Consider the following statements regarding the van der Waals (VdW) materials:

1. They are made of atomically thin layers are not mixed through a chemical reaction but rather attached to each other via a weak so called van der Waals interaction.
2. Graphene is a good example of van der Waal (VdW) material.

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** Until six years ago, such materials did not exist but today, researchers believe that they hold the key to 'post-silicon' electronics.

- VdW materials are made of piles of ultra-thin layers that are held together by weak van der Waals bonds, which arise when atoms are in close proximity.
- The success of graphene — a well known vdW material — stimulated scientists to look for other 2D crystals, where layers can be changed, added or removed in order to introduce new physical properties such as magnetism.
- Controlling magnetism, as is typical of such materials, could replace the current hard drive assemblies in computers and even become the key to quantum computing.

Source: The Hindu

**Q.2)** The term "Quadrantids" often seen in news is related to which of the following?

- a) Meteor showers
- b) Organic farming
- c) Nuclear fuel rods
- d) Earth like planets

**ANS: A**

**Explanation:** The Quadrantids, which peak during early-January each year, are considered to be one of the best annual meteor showers.

- Most meteor showers have a two day peak, which makes catching sight of these other meteors much more possible.
- The Quadrantids peak, on the other hand, is much shorter—only a few hours. (The reason the peak is so short is due to the shower's thin stream of particles and the fact that the Earth crosses the stream at a perpendicular angle.)
- During its peak, 60 to as many as 200 Quadrantid meteors can be seen per hour under perfect conditions.
- Quadrantids are also known for their bright fireball meteors. Fireballs are larger explosions of light and color that can persist longer than an average meteor streak.
- This is due to the fact that fireballs originate from larger particles of material. Fireballs are also brighter, with magnitudes brighter than -3.

Source: The Hindu

**Q.3)** The term “SPINK1” often seen in news is related to which of the following?

- a) Cancer genes (cells)
- b) Solar satellite
- c) long distance telescope
- d) Malarial resistant

**ANS: A**

**Explanation:** The SPINK1-positive prostate cancer subtype derives its name from the excess amount of SPINK1 oncogene found in the cancer cells.

- Excess production of SPINK1 gene responsible for tumour and metastasis is not restricted to prostate cancer alone but also seen in colorectal, lung, pancreatic, breast and ovarian cancers.
- The molecular mechanism and pathobiology of SPINK1-positive prostate cancer subtype, the second most recurrent and aggressive in nature that affects about 15% of patients has been finally unravelled.
- The insights gained in this study might therefore help in the treatment and disease management of several SPINK1-positive malignancies.
- In addition to excess amount of the SPINK1 oncogene, the researchers found that most cancer cells belonging to this subtype also have more than normal amount of a particular protein called EZH2.
- Also, the levels of two micro RNAs (miRNA-338-5p and miRNA-421) produced in SPINK1-positive cancer cells were much less.

Source: The Hindu

**Q.4)** The “Skai” sometimes seen in news is related to which of the following?

- a) Solar powered car
- b) Solar powered flight
- c) Hydrogen powered flying car
- d) Helium powered flying drone

**ANS: C**

**Explanation:** Massachusetts startup Alaka'i has designed a flying car - Skai - that the company touts as the “first air mobility vehicle powered by hydrogen fuel cells”.

- The hydrogen fuel cells give the five-passenger Skai a maximum range of 400 miles (640 km) with a flight time of up to four hours.
- Like a drone, the Skai takes off and lands vertically. It's one of many similar electric flying crafts in production, including prototypes from Boeing and Airbus that made successful test flights this year, according to Vertical Flight Society, an industry group.
- Most are powered by batteries, which can add a lot of weight. The Skai instead uses very light hydrogen fuel cells to run its rotors, giving it a range of 644 km and the capacity to carry 454 kilograms in people or freight, the company says.

Source: ForumIAS factly

**Q.5)** Recently Pubpeer website, which monitors image manipulation and duplication, has disclosed 130 research papers for plagiarism by which of the following institute?

- a) Indian Institute of Technology – Dhanbad
- b) Indian Institute of Toxicology Research (IITR)
- c) Indian Institute of Technology – Bombay
- d) Indian Institute of Science – Bangalore

**ANS: B**

**Explanation:** The credibility of the Indian Institute of Toxicology Research (IITR), Lucknow, has come under a cloud after at least 130 papers published by the institute over the years have been listed on a website that monitors image manipulation and duplication.

- The authors and teams of these papers – published between 2004 and 2018 – vary.
- However, Yogeshwer Shukla, the IITR's chief scientist of food, drug and chemical toxicology, is the common name in 49 of the articles that have been flagged by Pubpeer, the monitoring website.

Source: The Hindu

**Q.6)** The “Ai – Da” is sometimes seen in news is related to which of the following?

- a) Humanoid (robot) Artist
- b) Japanese Satellite
- c) Artificial Intelligence (AI) based calculator
- d) Artificial Intelligence (AI) based radar system

**ANS: A**

**Explanation:** Billed as “one of the most exciting artists of our time”, Ai-Da differs from generations of past masters in one inescapable way: she is a robot.

- Ai-Da is the brainchild of Aidan Meller, who claims she is the world's first ultra-realistic humanoid artist, able to draw creatively thanks to in-built artificial intelligence (AI) technology.
- The 46-year-old art dealer recently unveiled Ai-Da — dressed in a brown wig and period-style painter's blouse — in Oxford, ahead of an exhibition of her first works opening next week in the English University City.

Source: The Hindu

**Q.7)** The “Washi paper” is sometimes seen in news is famous in which of the following country?

- a) China
- b) Taiwan
- c) Mongolia
- d) Japan

**ANS: D**

**Explanation:** Once an indispensable part of daily life in Japan, ultra-thin washi paper was used for everything from writing and painting to lampshades, umbrellas, and sliding doors, but demand has plunged as lifestyles have become more westernized.

- Despite its 1,300-year history and UNESCO Intangible Cultural Heritage status, washi paper is struggling to attract consumers and the market value has dropped by more than 50% in the past two decades.
- The world's thinnest paper has helped save historical documents at major museums and libraries — including the Louvre in Paris, the British Museum and Washington's Library of Congress — from decay.
- The traditional hand-made paper is manufactured from plants called kozo, or mulberry, which has fibres that are much longer than materials used for paper in the west such as wood and cotton.

Source: The Hindu



**Q.8)** Consider the following statements regarding the electronic tattoo:

1. It is made of a piezoelectric polymer called polyvinylidene fluoride, capable of generating its own electric charge in response to mechanical stress.
2. It is a wearable device that can be placed on the skin to measure a variety of body responses.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** A novel electronic tattoo made from stretchy, lightweight material could make heart health monitoring easier and more accurate than existing electrocardiograph machines.

- This is the latest advance in the team's electronic tattoo technology, a graphene-based wearable device that can be placed on the skin to measure a variety of body responses, from electrical to biomechanical signals.
- The latest e-tattoo developed by researchers at the University of Texas at Austin in the U.S. is so light and stretchable that it can be placed over the heart for extended periods with little or no discomfort.
- It also measures cardiac health in two ways, taking electrocardiograph and seismocardiograph readings simultaneously.
- The electrocardiogram (ECG) method records the rates of electrical activity produced each time the heart beats.
- Seismocardiography (SCG) is a measurement technique using chest vibrations associated with heartbeats.
- Powered remotely by a smartphone, the e-tattoo is the first ultrathin and stretchable technology to measure both ECG and SCG.
- e-tattoo is made of a piezoelectric polymer called polyvinylidene fluoride, capable of generating its own electric charge in response to mechanical stress.
- The device also includes 3D digital image correlation technology that is used to map chest vibrations in order to identify the best location on the chest to place the e-tattoo.

Source: The Hindu

**Q.9)** The Experimental Advanced Superconducting Tokamak (EAST) nuclear fusion reactor is recently in news was developed by which country?

- a) USA
- b) Japan
- c) France
- d) China

**ANS: D**

**Explanation:** Scientists around the world have been trying for decades to recreate the unfathomable power of the sun here on Earth, and a team in China has managed to best our local star. Not for very long, though.

- The team operating the Experimental Advanced Superconducting Tokamak (EAST) managed to heat the reactor's internal plasma to 100 million degrees Celsius (212 million Fahrenheit).

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- That's six times hotter than the sun, but it doesn't have any net power generation. In stars, hydrogen fuses into helium, and eventually into heavier elements.
- The fusion process releases large amounts of energy, and the byproducts of fusion aren't radioactive.
- The only nuclear power we've managed to utilize on Earth is fission, which requires dangerous radioactive materials and comes with the risk of a reactor meltdown.

Source: The Hindu

**Q.10)** The "Mission Shakti" is recently launched by Government is related to which of the following?

- a) Promote Women welfare
- b) Promote girl child rights
- c) Promote religious rights
- d) To contain space debris

**ANS: D**

**Explanation:** Mission Shakti which was launched recently was done in a low orbit of less than 300 kilometres and at a particular angle to ensure that minimal debris was disbursed above into space to avoid damage to other satellites or the International Space Station (ISS).

Source: The Hindu

## Science

**Q.1)** The “Ophichthus kailashchandrai”, sometimes seen in news is related to which of the following?

- a) Banana variety
- b) Frog species
- c) Snake eel species
- d) Butterfly species

**ANS: C**

**Explanation:** A new snake eel species residing in the Bay of Bengal has been discovered and documented this month (January) by the Estuarine Biology Regional Centre (EBRC) of the Zoological Survey of India (ZSI) at Gopalpur-on-sea in Odisha.

- This new marine species has been named Ophichthus kailashchandrai to honour the vast contributions of Dr. Kailash Chandra, Director of ZSI, to Indian animal taxonomy.
- Ophichthus kailashchandrai is the eighth species of the Ophichthus genus found on the Indian coast. It is the fifth new species discovered by the Gopalpur ZSI in the last two years.
- The eel family ‘Ophichthidae’ comprises two sub-families — Myrophinae (69 species) and Ophichthinae (276 species).
- The sub-family Ophichthinae is identified by its hard tail and other osteological (bone) features, and it has 17 genera and 24 species.
- Out of them, seven species from the Ophichthus genus were earlier identified in Indian waters. The recent discovery is the eighth species of this genus.
- The Ophichthus kailashchandrai lives at a depth of around 50 metres in the sea. According to the studied specimens, individuals of this species are around 420 mm to 462 mm in length.
- They are light brown in colour, with white fins. They have a well-developed pectoral fin and also have a dorsal fin.
- Their posterior nostril is a hole covered by a flap on the upper lip opening towards the mouth.
- There are 180-182 total vertebrae in this new species. Their teeth are moderately elongated, conical and sharp.

Source: The Hindu

**Q.2)** Recently, which of the following institute Successfully/efficiently removes heavy metals simultaneously from water?

- a) Indian Institute of Technology – Bombay
- b) Indian Institute of Technology – Madras
- c) Indian Institute of Technology – Kharagpur
- d) Indian Institute of Technology – Roorkee

**ANS: A**

**Explanation:** Simultaneously removing heavy metals such as arsenic, chromium, cadmium and mercury from waste water with very high efficiency now appears possible, thanks to the work of researchers at the Indian Institute of Technology (IIT) Bombay.

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- The carbon-based nanostructure that the team fabricated shows 80-90% adsorption efficiency for all the four heavy metals studied.
- No electricity is required for the nanostructure to remove heavy metals from water as it allows for gravity-driven purification of the water.
- The nanostructures can be recycled and reused multiple times.
- While there is an initial drop of about 8% after the first cycle, the efficiency remains constant at 75-85% in the subsequent cycles.
- The carbon nanostructure is able to adsorb the heavy metals in the wide range of pH conditions — pH 2 to 13.

Source: The Hindu

**Q.3)** “Truenat” is often seen in news is related to which of the following?

- a) CoVID – 19 testing kit
- b) Tuberculosis (TB) testing kit
- c) Malaria testing kit
- d) Japan encephalitis testing kit

**ANS: B**

**Explanation:** In a Rapid Communication published on January 14 – 2020, the World Health Organization (WHO) had mentioned that the India-made Truenat MTB, a molecular diagnostic test to diagnose pulmonary and extrapulmonary TB and rifampicin-resistant TB, has high diagnostic accuracy.

- Truenat MTB has “high diagnostic accuracy as initial test to diagnose TB and to sequentially detect rifampicin resistance”, says the WHO Communication.
- Truenat MTB will be used as an initial test to diagnose TB thus replacing sputum smear microscopy.
- Truenat is developed by the Goa-based Molbio Diagnostics.
- The company was provided with technical assistance and resources by the Foundation for Innovative New Diagnostics (FIND) to help commercialize Truenat. Indian Council of Medical Research (ICMR) had assessed and validated the diagnostic tool.

Source: Indian Express

**Q.4)** The Earth’s oldest known mineral is found in which of the following Continent?

- a) Antarctica
- b) North America
- c) Africa
- d) Australia

**ANS: D**

**Explanation:** A meteorite that crashed into rural southeastern Australia in a fireball in 1969 contained the oldest material ever found on Earth, stardust that predated the formation of our solar system by billions of years, scientists said on January 13 – 2020.

- The oldest of 40 tiny dust grains trapped inside the meteorite fragments retrieved around the town of Murchison in Victoria state dated from about 7 billion years ago, about 2.5 billion years before the sun, Earth and rest of our solar system formed, the researchers said.
- Scientists previously had found a pre-solar grain in the Murchison meteorite that was about 5.5 billion years old, until now the oldest-known solid material on Earth.

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- The oldest-known minerals that formed on Earth are found in rock from Australia's Jack Hills that formed 4.4 billion years ago, 100 million years after the planet formed.

Source: The Hindu

**Q.5)** According to the World Health Organization (WHO), which of the following disease (s) is/are considered as Neglected Tropical Disease (NTD)?

1. Chagas disease
2. Dengue fever
3. Rabies

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** Neglected tropical diseases (NTDs) – a diverse group of communicable diseases that prevail in tropical and subtropical conditions in 149 countries – affect more than one billion people and cost developing economies billions of dollars every year.

Populations living in poverty, without adequate sanitation and in close contact with infectious vectors and domestic animals and livestock are those worst affected.

As of 2017, the World Health Organization categorizes the following communicable diseases as neglected tropical diseases (NTDs):

- Buruli Ulcer
- Chagas Disease
- Chromoblastomycosis
- Cysticercosis
- Dengue Fever
- Dracunculiasis (Guinea Worm Disease)
- Echinococcosis
- Fascioliasis
- Human African Trypanosomiasis (African Sleeping Sickness)
- Leishmaniasis
- Leprosy (Hansen's Disease)
- Lymphatic Filariasis
- Mycetoma
- Onchocerciasis
- Rabies
- Schistosomiasis
- Soil-transmitted Helminths (STH) (Ascaris, Hookworm, and Whipworm)
- Trachoma
- Yaws

Source: WHO

**Q.6)** Recently which of the following Indian Institute of Technology (IIT) designed a new sodium sulphur battery which can be operated at room temperature?

- a) IIT – Bombay
- b) IIT – Hyderabad
- c) IIT – Madras

d) IIT – Kanpur

**ANS: C**

**Explanation:** While conventional sodium sulphur batteries require very high temperature (300 degree C) for operation, researchers at the Indian Institute of technology (IIT) Madras have designed a new sodium sulphur battery that can be operated at room temperature. By operating the battery at room temperature, the team was able to achieve higher charge storage capacity (technically called the specific capacity) and nearly zero self-discharge when the battery is not being used.

Source: The Hindu

**Q.7)** Consider the following statements regarding the benefits of Gene Editing:

1. It can be used to treat many human diseases & genetic disorders like HIV/AIDS, hemophilia.
2. It could form the basis of highly efficient & cost effective next generation antibiotics.
3. It can be used to bring to life extinct species.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** It is a type of genetic engineering in which DNA is inserted, deleted or replaced in the genome of an organism using artificially engineered nucleases, or “molecular scissors”.

- Human genome editing can be used to treat many human diseases & genetic disorders like HIV/AIDS, hemophilia etc.
- It could substantially bolster disease resistance in humans & increase life span.
- It could form the basis of highly efficient & cost effective next generation antibiotics (based on bacteriophage viruses).
- Gene editing can be used to protect endangered species or bring to life extinct species.
- It can be used to grow healthier food (via fortification) and increasing harvest.
- It has the potential to slow down the spread of diseases by eliminating its means of transmission. E.g. Gene editing can be used to introduce sterile mosquitoes into the environment.

Source: NCERT

**Q.8)** Consider the following statements regarding the “benzoic acid”:

1. It is white crystalline organic compound belongs to the family of carboxylic acid.
2. It is commonly used as a pH adjustor and preservative in food.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Benzoic acid is an organic compound which is described by the chemical formula  $C_6H_5COOH$ .

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- It consists of a carboxyl group attached to a benzene ring. Therefore, benzoic acid is said to be an aromatic carboxylic acid.
- This compound exists as a crystalline, colorless solid under normal conditions.
- It is white and belongs to the family of carboxylic acid.
- The term 'benzoate' refers to the esters and salts of  $C_6H_5COOH$ .
- The commercial production of benzoic acid is done via the partial oxidation of toluene with oxygen, catalyzed by manganese or cobalt naphthenates.

Some important uses of  $C_6H_5COOH$  are listed below.

- The production of phenol involves the use of benzoic acid.
- This compound is used in ointments that prevent or treat fungal skin diseases.
- $C_6H_5COOH$  is used as a preservative in the food industry.
- Benzoic acid is an ingredient in many cosmetic products, such as lipsticks.
- It is also a precursor to benzoyl chloride.
- One of the components of toothpaste, mouthwash, and face-wash creams is  $C_6H_5$
- This compound is also used in the manufacture of dyes and in insect repellants.

Source: NCERT

**Q.9)** The term "Keratinocytes" is related to which of the following?

- a) Primary skin cell
- b) Liver cells
- c) Muscle cells
- d) Sex cells

**ANS: A**

**Explanation:** Keratinocytes are the primary type of cell found in the epidermis, the outermost layer of the skin.

- In humans they constitute 90% of epidermal skin cells.
- Basal cells in the basal layer (stratum basale) of the skin are sometimes referred to as basal keratinocytes.
- By using an indigenously developed hydrogel made of a polymer (polyacrylamide) in lieu of the conventional plastic tissue culture plates, researchers at the Indian Institute of Technology (IIT) Bombay have been able to achieve many-fold increase in the number of skin cells (keratinocytes) cultured in the lab.
- Unlike traditional methods, no feeder layer or drug is needed when cells are grown on the hydrogel substrate.

Source: The Hindu

**Q.10)** The term "Saggitarius \*A" is often seen in news is related to which of the following?

- a) Meteorite
- b) Black hole
- c) Goldilocks zone
- d) Asteroids

**ANS: B**

**Explanation:** The center of our Milky Way Galaxy is anchored by a black hole that is nearly 5 million times the mass of our Sun.

- Surrounding it is a chaotic city of stars, gas, and dust that we call Sagittarius A.
- We stacked false-color X-ray, infrared, and radio images into this single picture to show you the different structures hidden inside the core of our Galaxy.
- X-rays (purple) radiate from the super-hot gas trapped in the black hole's grasp.

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- The surrounding dust is heated by friction as it chaotically orbits around the black hole and then glows in infrared light (gold).
- And the enormous pools and three-armed rivers of gas shine in radio light (oranges and reds) to trace the complexity of magnetic fields in this violent neighborhood.

NOTE: A language professor has given a Hawaiian name — Powehi — to the black hole depicted in an image produced in a landmark experiment.

Though the Event Horizon Telescope set out to image both M87 and Sagittarius A\* the black hole at the centre of the Milky way, they have succeeded only in imaging the former, despite its being much further away.

Source: The Hindu

ForumIAS



## Science

**Q.1)** Which of the following pair (s) is/are correctly matched?

- |               |   |                         |
|---------------|---|-------------------------|
| Fruits        | : | Vitamin/Antioxidant     |
| 1. Red grapes | : | Antioxidant resveratrol |
| 2. Mango      | : | Vitamin A               |
| 3. Banana     | : | Vitamin B6              |

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** Mangoes are seasonal fruits, and both are high on fibre. The former has vitamin A (a precursor to beta carotene and is antioxidant-rich) and C that helps build immunity.

Banana is one of the easiest snacks to consume: it 'pre-packaged' with B6, magnesium and potassium.

Red wine is made from grapes that contain an antioxidant resveratrol that is good for the heart.

Source: NCERT and The Hindu

**Q.2)** "National Gene Fund" is constituted by Government of India is related to which of the following?

- a) pharmaceuticals
- b) Animal Cloning
- c) Plant varieties
- d) None of the above

**ANS: C**

**Explanation:** The Government of India has notified the Protection of Plant Varieties and Farmers Rights (Recognition and Reward from the Gene Fund) Rules, 2012, whereby a farmer who is engaged in the conservation of genetic resources of land races and wild relatives of economic plants and their improvement through selection and preservation shall be entitled to "Plant Genome Saviour Farmer Reward & Farmer Recognition" along with cash prize from National Gene Fund.

There are 10 rewards each comprising of citation, memento and cash of Rs. One and half lakh each and 20 recognitions each consisting of a cash prize of Rs. One Lakh, citation and memento in a year.

Source: The Hindu

**Q.3)** Consider the following statements regarding the "Biotherapeutic medicines or biologics":

- 1. It is a product that is produced from living organisms or contains components of living organisms.
- 2. Most biologics are complex mixtures that are not easily identified or characterized.

Which of the statements given above is/are correct?

- a) 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Biological products include a wide range of products such as vaccines, blood and blood components, allergens, somatic cells, gene therapy, tissues, and recombinant therapeutic proteins.

- Biologics can be composed of sugars, proteins, or nucleic acids or complex combinations of these substances, or may be living entities such as cells and tissues.
- Biologics are isolated from a variety of natural sources - human, animal, or microorganism - and may be produced by biotechnology methods and other cutting-edge technologies.
- Gene-based and cellular biologics, for example, often are at the forefront of biomedical research, and may be used to treat a variety of medical conditions for which no other treatments are available.
- In contrast to most drugs that are chemically synthesized and their structure is known, most biologics are complex mixtures that are not easily identified or characterized.
- Biological products, including those manufactured by biotechnology, tend to be heat sensitive and susceptible to microbial contamination.
- Therefore, it is necessary to use aseptic principles from initial manufacturing steps, which is also in contrast to most conventional drugs.
- Biological products often represent the cutting-edge of biomedical research and, in time, may offer the most effective means to treat a variety of medical illnesses and conditions that presently have no other treatments available.

Source: WHO

**Q.4)** Consider the following statements regarding the “measuring units”:

1. Standard units of measure such as the Kilogram, second, metre, ampere, Kelvin, mole and candela defined on the basis of physics constants.
2. The CSIR-NPL is India’s official reference keeper of units of measurements.

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** With the definition of the ‘kilogram’ getting a global, technical makeover, textbooks — from those used in schools to ones recommended by engineering colleges in India — are set to undergo an update.

- The kilogram derived its provenance from the weight of a block of a platinum-iridium alloy housed at the International Bureau of Weights and Measures in France.
- All other prototypes that served as national reference standards, including the one at New Delhi’s CSIR-National Physical Laboratory (NPL), were calibrated to it. No longer.

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- The kilogram joined other standard units of measure such as the second, metre, ampere, Kelvin, mole and candela that would no longer be defined by physical objects.
- The measures are all now defined on the basis of unchanging universal, physics constants. The kilogram now hinges on the definition of the Planck Constant, a constant of nature that relates to how matter releases energy.
- The CSIR-NPL, which is India's official reference keeper of units of measurements, on Monday, released a set of recommendations requiring that school textbooks, engineering-education books, and course curriculum update the definition of the kilogram.

Source: The Hindu

**Q.5)** The term “Kibble Balance” is often seen in news is related to which of the following?

- a) Device to measure Planck Constant.
- b) Device to measure heat balance.
- c) Device to measure water balance.
- d) Device to measure wind balance.

**ANS: A**

**Explanation:** ‘Kibble Balance’, is a device that was used to measure the Planck Constant and thereby reboot the kilogram.

- Named after its inventor, Bryan Kibble at the U.K.'s National Physical Laboratory (NPL), who conceptualized it in 1975, the Kibble balance is an exquisitely accurate weighing machine.
- Like any balance, it is designed to equalize one force with another: In this case, the weight of a test mass is exactly offset by a force produced when an electrical current is run through a coil of wire immersed in a surrounding magnetic field.

Source: NCERT & The Hindu

**Q.6)** Which of the following tree is also called as “Magic Tree”?

- a) Palm tree
- b) Banyan tree
- c) Drumstick tree
- d) Papaya tree

**ANS: C**

**Explanation:** Magic Moringa Tree has been crowned by WHO as a magical tree. In Europe and America was happening once called as “Miracle Tree”.

- Apparently it's called "Kelor Tree" in Indonesia.
- Researchers have finally unravelled how each part of drumstick (*Moringa oleifera*), the “magic tree”, is nutritionally rich compared with other plants such as rice, papaya, spinach and cocoa.
- All the five tissues — stem, root, leaf, flower and seed — of drumstick studied were found to be rich either in certain vitamins or essential minerals.
- A team led by Prof. from the National Centre for Biological Sciences (NCBS), Bengaluru analysed the genes on complimentary DNA (cDNA) of all the five tissues.
- The team found drumstick leaves, which are the most nutritious part of the tree, are rich in vitamins, while the roots are mineral-rich.
- The stem is rich in vitamin C and the flowers and seeds are rich in potassium. The pod and flower also have enzymes that help bring down cholesterol level.

Source: The Hindu

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**Q.7)** Recently, India's largest Liquid Hydrogen Storage Tank is established in which of the following state?

- a) Tamil Nadu
- b) Karnataka
- c) Kerala
- d) Andhra Pradesh

**ANS: D**

**Explanation:** ISRO Chairman K Sivan flagged off the shipment of India's largest liquid hydrogen storage tank at the VRV Asia Pacific's manufacturing plant at Sri City in Chittoor district of Andhra Pradesh.

- VRV Asia Pacific manufactured the storage tank with a Liquid Nitrogen (LIN) shield, in a collaborative effort with Satish Dhawan Space Centre (SDSC) SHAR, under the Make in India initiative.
- The storage capacity of the tank is 120 kilo liters. Liquid hydrogen is used as fuel for satellite launch vehicles.

Source: The Hindu

**Q.8)** The words "Motion interpolation, video interpolation, and the soap opera effect" is often seen in news is related to which of the following?

- a) Frame rate of videos
- b) Long distance telescopes
- c) Micro telescopes for drug therapy
- d) Thermal image radar system

**ANS: A**

**Explanation:** Motion smoothing is also known as motion interpolation, video interpolation, and the soap opera effect, it refers to a process of reducing motion blur by artificially inflating the frame rate of the film or series.

- So, from 24 frames per second (fps) it is increased to 60fps, 120fps or even higher (higher rates are perceived as motion), digitally combining the images to simulate more.
- This effect can be useful when watching sports, as the action moves quickly, and enabling the feature allows viewers to catch more details.

Source: The Hindu

**Q.9)** Recently the World Health Organization said that "burnout" remains an "occupational phenomenon" and it is not considered as a medical condition. Which of the following is/are the characteristics of burnout syndrome?

1. Feelings of energy depletion or exhaustion.
2. Increased mental distance from one's job.
3. Reduced professional efficacy.

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** The World Health Organization said on May 28 that “burnout” remains an “occupational phenomenon” that could lead someone to seek care but it is not considered a medical condition.

- The clarification came a day after the WHO mistakenly said it had listed burnout in its International Classification of Diseases (ICD) for the first time.
- While burnout was listed in the previous version, the ICD-10, its definition has been changed in the latest edition of the text. “The definition has been modified based on existing research”.
- WHO has now defined burnout as “a syndrome conceptualised as resulting from chronic workplace stress that has not been successfully managed”.
- It said the syndrome was characterised by: “1) feelings of energy depletion or exhaustion; 2) increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and 3) reduced professional efficacy.”
- “Burn-out refers specifically to phenomena in the occupational context and should not be applied to describe experiences in other areas of life,” according to the definition.

Source: WHO

**Q.10)** Consider the following statements regarding “Poly-metallic Nodules”:

1. These are commonly called manganese nodules.
2. These are most abundant on abyssal plains.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Of all the mineral resources considered as potential targets for deep-sea mining, poly-metallic nodules (also commonly called manganese nodules) are probably the most likely commodity to be developed into a commercial operation.

- Poly-metallic nodules are rounded accretions of manganese and iron hydroxides that cover vast areas of the seafloor, but are most abundant on abyssal plains at water depths of 4000-6500 metres.
- They form through the aggregation of layers of iron and manganese hydroxides around a central particle (such as a shell or small rock fragment), and range in size from a few millimeters to tens of centimeters.
- The composition of nodules varies with their environment of formation, but in addition to manganese and iron, they can contain nickel, copper and cobalt in commercially attractive concentrations as well as traces of other valuable metals such as molybdenum, zirconium and Rare Earth Elements.

Source: NCERT & Agraphari

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## Science & Technology

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**Q.1)** “The indigenously developed Cryogenic Upper Stage (CUS) forms the third stage of GSLV Mk II”. Cryogenic engine fuel is a mix of which of the following?

- a) Liquid Nitrogen and Liquid Hydrogen
- b) Liquid Hydrogen and Liquid Oxygen
- c) Liquid Oxygen and Liquid Nitrogen
- d) Liquid Nitrogen and mono-methyl-hydrazine

**ANS: B**

**Explanation:** Geosynchronous Satellite Launch Vehicle Mark II (GSLV Mk II) is the largest launch vehicle developed by India, which is currently in operation.

- This fourth generation launch vehicle is a three stage vehicle with four liquid strap-ons.
- The indigenously developed cryogenic Upper Stage (CUS), which is flight proven, forms the third stage of GSLV Mk II.
- Cryogenic engine makes use of Liquid Oxygen (LOX) and Liquid Hydrogen (LH<sub>2</sub>) as propellants which liquefy at -183 deg C and -253 deg C respectively.
- LOX and LH<sub>2</sub> are stored in their respective tanks. From there they are pumped in to turbo pump by individual booster pumps to ensure a high flow rate of propellants inside the combustion/thrust chamber.
- The major components of a cryogenic rocket engine are combustion/thrust chamber, igniter, fuel injector, fuel cryo pumps, oxidizer cryo pumps, gas turbine, cryo valves, regulators, the fuel tanks and a rocket engine nozzle.

Source: ForumIAS Factly

**Q.2)** The Vikas engine is/are the workhorse for which of the following Launch Vehicles?

1. Augmented Satellite Launch Vehicle (ASLV)
2. Polar Satellite Launch Vehicle (PSLV)
3. Geo-synchronous Launch Vehicle (GSLV)

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** Vikas Engine is the workhorse liquid rocket engine powering the second stage of India's Polar Satellite Launch Vehicle (PSLV), second stage and the four strap on stages of Geosynchronous Launch Vehicle (GSLV) and the twin engine core liquid stage (L110) of GSLV Mk-III.

Source: ForumIAS Factly

**Q.3)** The DART mission is going to launch by NASA in July 2021 is related to which of the following?

- a) Asteroids
- b) Jupiter Planet
- c) Sun
- d) Venus Planet

**ANS: A**

**Explanation:** The Double Asteroid Redirection Test (DART) mission is directed by NASA to the Applied Physics Laboratory (APL) with support from several NASA centers: the Jet Propulsion Laboratory (JPL), Goddard Space Flight Center (GSFC), Johnson Space Center (JSC), Glenn Research Center (GRC), and Langley Research Center (LRC).

- DART is a planetary defense-driven test of technologies for preventing an impact of Earth by a hazardous asteroid.
- DART will be the first demonstration of the kinetic impactor technique to change the motion of an asteroid in space.
- The DART mission is in Phase C, led by APL and managed under NASA's Solar System Exploration Program.

Source: ForumIAS Factly

**Q.4)** Which of the following is/are mission/missions related to Mars Planet?

1. Magellan
2. Phoenix
3. Maven

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** Mars Missions by NASA:

- Mariner
- Mars Resonance Orbiter
- Phoenix
- MAVEN
- In-Sights Lander
- Curiosity Rover

Magellan mission is related to Planet Venus.

Source: NASA

**Q.5)** Which of the following are examples of Ballistic missiles?

1. Agni Missile
2. Prithvi Missile
3. Dhanush Missile
4. BrahMos Missile

Select the correct answer using the code given below:

- a) 1, 2, 3 and 4
- b) 2, 3 and 4 only
- c) 1 and 2 only
- d) 1, 2 and 3 only

**ANS: D**

**Explanation:**

(i) **Cruise Missile:** A cruise missile is an unmanned self-propelled (till the time of impact) guided vehicle that sustains flight through aerodynamic lift for most of its flight path and whose primary mission is to place an ordnance or special payload on a target. They fly within the earth's atmosphere and use jet engine technology. These vehicles vary greatly in their speed and ability to penetrate defences. Cruise missiles can be categorised by size, speed (subsonic or supersonic), range and whether launched from land, air, surface ship or submarine.

Depending upon the speed such missiles are classified as:

- 1) Subsonic cruise missile
- 2) Supersonic cruise missile
- 3) Hypersonic cruise missile

**Subsonic cruise missile** flies at a speed lesser than that of sound. It travels at a speed of around 0.8 Mach. The well-known subsonic missile is the American Tomahawk cruise missile. Some other examples are Harpoon of USA and Exocet of France.

**Supersonic cruise missile** travels at a speed of around 2-3 Mach i.e.; it travels a kilometre approximately in a second. The modular design of the missile and its capability of being launched at different orientations enable it to be integrated with a wide spectrum of platforms like warships, submarines, different types of aircraft, mobile autonomous launchers and silos. The combination of supersonic speed and warhead mass provides high kinetic energy ensuring tremendous lethal effect. **BRAHMOS** is the only known versatile supersonic cruise missile system which is in service.

**Hypersonic cruise missile** travels at a speed of more than 5 Mach. Many countries are working to develop hypersonic cruise missiles. BrahMos Aerospace is also in the process of developing a hypersonic cruise missile, **BRAHMOS-II**, which would fly at a speed greater than 5 Mach.

(ii) **Ballistic Missile:** A ballistic missile is a missile that has a ballistic trajectory over most of its flight path, regardless of whether or not it is a weapon-delivery vehicle. Ballistic missiles are categorised according to their range, maximum distance measured along the surface of earth's ellipsoid from the point of launch to the point of impact of the last element of their payload. The missile carry a huge payload. The carriage of a deadly warhead is justified by the distance the missile travels. Ballistic missiles can be launched from ships and land based facilities. For example, Prithvi I, Prithvi II, Agni I, Agni II and Dhanush ballistic missiles are currently operational in the Indian defence forces.



Source: BRAHMOS SPACE

**Q.6)** Consider the following statements regarding the Government Instant Messaging System (GIMS):

1. GIMS is the instant messaging platform for Government communication.
2. GIMS is being packaged for employees of Central, State and Local government departments and organizations for intra and inter organization communications.
3. Like WhatsApp, GIMS employs end-to-end encryption for one-to-one messaging.

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 only
- d) 2 and 3 only

**ANS: C**

**Explanation:** GIMS is the instant messaging platform for Government communication.

- GIMS platform provides GIMS mobile client for instant messaging and GIMS Portal for administration and monitoring of platform.
- Designed to suit the hierarchy and communication policies of the government.
- Adaptable to both the central and state government organizations for intra and inter organization communication.
- It is being developed as a secure Indian alternative without the security concerns attached with apps hosted abroad or those owned by foreign entities.
- Like WhatsApp, GIMS employs end-to-end encryption for one-to-one messaging.

Source: ForumIAS Factly



**Q.7)** Recently which state police has adopted a unique bar-coding software - Trakea - to ensure that thousands of forensic reports that form the backbone of the criminal investigation system?

- a) Andhra Pradesh
- b) Uttar Pradesh
- c) Maharashtra
- d) Haryana

**ANS: D**

**Explanation:** Haryana Police has adopted a unique barcoding software — Trakea — to ensure that thousands of forensic reports that form the backbone of the criminal investigation system and subsequent trials in the courts of law, are not tampered with.

- According to the police, Trakea ensures foolproof security of the samples collected from the scene of crime, and the forensic analysis reports, and is different from traditional methods that the state police force has been following for decades.
- Haryana Police claims it is the country's first police force to have introduced this unique barcoding for forensic reports.

Source: The Hindu

**Q.8)** Consider the following statements regarding e-waste clinic in India:

1. India's first e-waste clinic has been inaugurated in Indore, Madhya Pradesh.
2. It would enable segregation, processing and disposal of waste from both household and commercial units.
3. The clinic is set up in accordance with the Solid Waste Management Rules adopted in 2016.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) 1 and 3 only
- d) 2 and 3 only

**ANS: D**

**Explanation:** India's first e-waste clinic has been inaugurated in Bhopal and will enable segregation, processing and disposal of electronic waste from both household and commercial units.

- It was set up by the Bhopal Municipal Corporation and the Central Pollution Control Board.
- The e-waste clinic is developed on the bases of a three-month pilot project and, if successful, more clinics will be built throughout the country.
- The clinic is set up in accordance with the Solid Waste Management Rules adopted in 2016.

Source: The Hindu

**Q.9)** Consider the following statements regarding the IndiGen programme:

1. It aims to undertake whole genome sequencing of ten thousand Indian individuals representing diverse ethnic groups from India.
2. It is funded by the Council for Scientific and Industrial Research (CSIR).

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2

d) Neither 1 nor 2

**ANS: B**

**Explanation:** IndiGen programme aims to undertake whole genome sequencing of a thousand Indian individuals representing diverse ethnic groups from India.

- The objective is to create a pilot dataset to enable genetic epidemiology of carrier genetic diseases towards enabling affordable carrier screening approaches in India.
- We also hope to mine allele frequencies for genetic variants for estimating population scale prevalence for diverse clinical applications.
- The human genome data sets would also be utilized for prioritizing Pharmacogenomics variants specific for Indian population for optimizing therapy and minimizing adverse events.
- IndiGen is funded by the Council for Scientific and Industrial Research (CSIR).

Source: The Hindu

**Q.10)** Consider the following statements regarding the Indian Science Congress Association (ISCA):

1. It was the brainchild of Acharya Sir Prafulla Chandra Ray.
2. Indian Science Congress is organized by the ISCA every year in the first week of January.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The Indian Science Congress Association (ISCA) owes its origin to the foresight and initiative of two British Chemists, namely, Professor J. L. Simonsen and Professor P.S. MacMahon.

- It occurred to them that scientific research in India might be stimulated if an annual meeting of research workers somewhat on the lines of the British Association for the Advancement of Science could be arranged.
- The first meeting of the Congress was held from January 15-17, 1914 at the premises of the Asiatic Society, Calcutta, with the Honourable Justice Sir Asutosh Mukherjee, the then Vice-Chancellor of the Calcutta University, as President.
- One hundred and five scientists from different parts of India and abroad attended and the papers numbering 35 were divided into six sections-Botany, Chemistry, Ethnography, Geology, Physics, Zoology under six Sectional Presidents.
- Indian Science Congress is organised by the Indian Science Congress Association every year in the first week of January.

Source: ForumIAS Factly

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## Space & IT

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**Q.1)** Which of the following statements is/are correct about “Air Independent Propulsion (AIP) system”?

1. It is a technology which allows a nuclear submarine to operate without the need to access atmospheric oxygen.
2. India is self-sufficient in the AIP system and exports to other countries also.

Select the correct answer using the code given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** Submarines are essentially of two types: conventional and nuclear. Conventional submarines use a diesel-electric engine, and must surface daily for oxygen for fuel combustion.

- If fitted with an Air Independent Propulsion (AIP) system, the submarine needs to take in oxygen only once a week.
- The state-of-the-art “air independent propulsion” (AIP) system that the Defence R&D Organisation (DRDO) is indigenously developing will be ready to drive the Indian Navy’s submarines from 2024 onwards.
- Consequently, this AIP will not power the six new submarines that the navy is tendering in a Rs 45,000crore programme called Project 75-I.
- Instead, those six boats (as the navy traditionally refers to submarines) will have AIP systems that the foreign vendor must offer.

Source: Indian Express

**Q.2)** The term “Vyommitra” is recently in news is related to which of the following?

- a) Half-humanoid robot
- b) Satellite radar system
- c) Space education portal
- d) None

**ANS: A**

**Explanation:** Recently, Indian Space Research Organisation (ISRO) unveiled its first ‘woman’ astronaut, named Vyom Mitra who will ride to space in the first test flight of the human space mission, Gaganyaan.

- She is half-humanoid and her body stops at the torso and has no legs. She is capable of switching panel operations, performing Environment Control and Life Support Systems (ECLSS) functions, conversations with the astronauts, recognising them and solving their queries.

Source: ForumIAS factly

**Q.3)** The terms “Antu, Kueyen, Melipal and Yepun” is related to which of the following?

- a) Asteroids
- b) Planets of Jupiter
- c) Telescope
- d) Radar systems

**ANS: C**

**Explanation:** The Very Large Telescope array (VLT) is the flagship facility for European ground-based astronomy at the beginning of the third Millennium.

- It is the world's most advanced optical instrument, consisting of four Unit Telescopes with main mirrors of 8.2m diameter and four movable 1.8m diameter Auxiliary Telescopes.
- The telescopes can work together, to form a giant 'interferometer', the ESO Very Large Telescope Interferometer, allowing astronomers to see details up to 25 times finer than with the individual telescopes. The large telescopes are named Antu, Kueyen, Melipal and Yepun.

Source: NASA

**Q.4)** Which of the following statements is/are correct about "Aditya L1 mission"?

1. It is first scientific expedition of ISRO to study Sun.
  2. Aditya L1 satellite will be placed in the halo orbit around the Lagrangian point 1 (L1) of the sun-earth system.
  3. It will be launched using the Geo-synchronous Satellite Launch Vehicle (GSLV) Mark-III.
- Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** Aditya - L1 First Indian mission to study the Sun. The Aditya-1 mission was conceived as a 400kg class satellite carrying one payload, the Visible Emission Line Coronagraph (VELC) and was planned to launch in a 800 km low earth orbit.

- Satellite will be placed in the halo orbit around the Lagrangian point 1 (L1) of the Sun-Earth system has the major advantage of continuously viewing the Sun without any occultation/ eclipses.
- Therefore, the Aditya-1 mission has now been revised to "Aditya-L1 mission" and will be inserted in a halo orbit around the L1, which is 1.5 million km from the Earth. The satellite carries additional six payloads with enhanced science scope and objectives.
- The project is approved and the satellite will be launched during 2019 – 2020 timeframe by PSLV-XL from Sriharikota.
- Aditya-1 was meant to observe only the solar corona. The outer layers of the Sun, extending to thousands of km above the disc (photosphere) is termed as the corona.
- It has a temperature of more than a million degree Kelvin which is much higher than the solar disc temperature of around 6000K.
- How the corona gets heated to such high temperatures is still an unanswered question in solar physics.

Source: ISRO

**Q.5)** Which of the following statements is/are correct about "Quantum Computers"?

1. Quantum computers use logical units called quantum bits that can be put into a quantum state where they can simultaneously represent both 0 and 1.
2. Quantum computers works at a temperature of -273 °C (-459 °F) with hardly any atmospheric pressure and isolated from Earth's magnetic field.

Select the correct answer using the code given below:

- a) 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Quantum Computers work by harnessing the properties of quantum mechanics.

- Statement 1 is correct: As the reality of a quantum computer comes closer, it is useful for us to understand both how one functions and how it's different from a traditional computer. The first thing to bear in mind is that they use different basic units of data: 'bits' and 'qubits'.
- Every element of a classical computer is written in binary code (1s and 0s) and is translated into electricity: high voltage is represented by 1, and low voltage by 0. In quantum computing, qubits are the basic unit and their value can be 1, 0, or 1 and 0 simultaneously, overlapping (superposition) and intertwining (entanglement) according to the laws of physics.
- This means that qubits, as opposed to bits, can take on various values at one time and can perform calculations that a conventional computer cannot.
- Statement 2 is correct: The classical computer, if there is interference with the system; the system can correct itself and continue running. For the time being, this is not the case with quantum computers.
- "External disturbances force the system to define itself as 1 or 0, causing it to lose its quantum coherence.
- To avoid this kind of external 'noise,' the system has to be completely isolated: the atoms have to be very quiet, ensuring nothing makes them collide or interact with the surroundings.
- Quantum computers have to be at a temperature of -273 °C (-459 °F) with hardly any atmospheric pressure and isolated from Earth's magnetic field.

Source: The Hindu

**Q.6)** The term "Muktoshri" is related to which of the following?

- a) Life saving drug
- b) New variety of rice
- c) New variety of maize
- d) New endemic banana

**ANS: B**

**Explanation:** West Bengal government's rice research centre has come up with a new variety of rice called Muktoshri that can be grown in arsenic prone areas.

It was developed jointly by the Rice Research Station at Chinsurah, coming under West Bengal's Agriculture Department and the National Botanical Research Institute, Lucknow.

Source: The Hindu

**Q.7)** Which of the following statements is/are correct about "Polycrack Technology"?

1. It is world's first patented heterogeneous catalytic process which converts multiple feed stocks into hydrocarbon liquid fuels, gas, carbon and water.
2. It has high tolerance to moisture hence drying of waste is not required.
3. In polycrack, biological decomposition is not allowed as the Waste is treated as it is received.

Select the correct answer using the code given below:

- a) 1 only

- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** Polycrack technology is world's first patented heterogeneous catalytic process which converts multiple feed stocks into hydrocarbon liquid fuels, gas, carbon and water. Polycrack Plant can be fed with all types of Plastic, Petroleum sludge, Un-segregated MSW (Municipal Solid Waste) with moisture up to 50%, E-Waste, Automobile fluff, Organic waste including bamboo, garden waste etc., and Jatropha fruit and palm bunch.

Polycrack has the following advantages over the conventional approach of treating solid waste:-

- Pre-segregation of waste is not required to reform the waste. Waste as collected can be directly fed into Polycrack.
- It has high tolerance to moisture hence drying of waste is not required.
- Waste is processed and reformed within 24 hours.
- It is an enclosed unit hence the working environment is dust free.
- Excellent air quality surrounding the plant.
- Biological decomposition is not allowed as the Waste is treated as it is received.
- The foot print of the plant is small hence the area required for installing the plant is less when compared with conventional method of processing.
- All constituents are converted into valuable energy thereby making it Zero Discharge Process.
- Gas generated in the process is re-used to provide energy to the system thereby making it self-reliant and also bring down the operating cost.
- There is no atmospheric emission during the process unlike other conventional methods except for combustion gases which have pollutants less than the prescribed norms the world over.
- Operates around 450 degrees, making it a low temperature process when compared with other options.
- Safe and efficient system with built-in safety features enables even an unskilled user to operate the machine with ease.
- Low capital cost and low operating cost.
- Fully automated system requires minimum man power.

Source: ForumIAS factly

**Q.8)** "Project Soli" is launched by which of the following?

- a) Google
- b) IBM
- c) Facebook
- d) Tesla

**ANS: A**

**Explanation:** Project Soli, driven by Google's Advanced Technology and Projects (ATAP) team, was first showcased back in 2015.

The idea is that a radar chip can be used to detect hand movements and gestures to interpret what they could mean.

It's only recently that Google figured out how to reduce the size of this radar chip and fit it on the front of the smart phone, still ensuring accuracy.

Source: The Hindu

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**Q.9)** The “LOx methane” is recently in news is related to which of the following?

- a) Space rocket engine fuel
- b) High speed diesel variant
- c) Bio-diesel
- d) None

**ANS: A**

**Explanation:** The Indian Space Research Organization (ISRO) is developing methane-powered rocket engines.

- The space agency is developing two ‘LOx methane’ engines (liquid oxygen oxidiser and methane fuel) engines.
- One of the two projects is trying to convert the existing cryogenic engine, which uses liquid hydrogen for fuel, into a LOx methane engine.
- The other is a smaller engine of 3 tonnes thrust, which will feature an electric motor.
- These are being developed at ISRO’s Liquid Propulsion Systems Centre at Trivandrum.

Source: ISRO

**Q.10)** The “Head on Generation (HOG)” technology is sometimes in news is related to which of the following?

- a) Driverless car
- b) Drones
- c) Tractors
- d) Trains

**ANS: D**

**Explanation:** The South Central Railway (SCR) announced the introduction of a new technology – Head On Generation (HOG) system – in Telangana Express where power from the engine would be supplied to the entire train for lighting and air-conditioning.

- The trains like these have two power cars known as End On Generators (EOG) on either end to provide electricity to all the coaches.
- These power cars produce electricity by the diesel generators with each using 40 litres of fuel per hour for a non-AC coach and 65-70 litres of diesel per hour per coach in case of an AC coach.
- The new HOG technology obviates the need for using diesel as power is tapped from the overhead electric traction lines through a pantograph to the train engine and the same is distributed to the trailing coaches.
- Earlier, the power supply from the overhead electric traction was being used to only run the engine and haul the coaches.
- “The new system does not require any diesel and hence, will reduce air and noise pollution, besides providing uninterrupted illumination in all the coaches.
- On an average, it will reduce carbon emission by 700 metric tonnes per year per train”.

Source: The Hindu

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## *Science & Technology*

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**Q.1)** The word “Roc” is often seen in news is related to which of the following?

- a) Satellite to study stratosphere
- b) Largest aircraft
- c) Helium balloon to study stratosphere
- d) Drone to study upper atmosphere

**ANS: B**

**Explanation:** The world's largest aircraft took off over the Mojave Desert in California, the first flight for the carbon-composite plane built by Stratolaunch Systems Corp, started by late Microsoft co-founder Paul Allen, as the company enters the lucrative private space market.

The white airplane called Roc, which has a wingspan the length of an American football field and is powered by six engines on a twin fuselage, took to the air shortly before 7 a.m. Pacific time (1400 GMT) and stayed aloft for more than two hours before landing safely back at the Mojave Air and Space Port as a crowd of hundreds of people cheered.

Source: ForumIAS Factly

**Q.2)** Recently, which of the following country unveiled a 3D print of a heart with human tissue and vessels?

- a) United States of America
- b) China
- c) Israel
- d) Australia

**ANS: C**

**Explanation:** Scientists in Israel unveiled a 3D print of a heart with human tissue and vessels, calling it a first and a “major medical breakthrough” that advances possibilities for transplants.

- The heart marked “the first time anyone has successfully engineered and printed an entire heart replete with cells, blood vessels, ventricles and chambers,” said Tel Aviv University’s Tal Dvir, who led the project.
- People have managed to 3D-print the structure of a heart in the past, but not with cells or with blood vessels.

Source: The Hindu

**Q.3)** The “Gravitational Lensing” concept is often seen in news is suggested by which of the following scientist?

- a) Albert Einstein
- b) Yakov Borisovich Zel'dovich
- c) Igor Dmitriyevich Novikov
- d) Stephen Hawking

**ANS: A**

**Explanation:** Black holes are not radiant and will not be visible through any telescope.

- However, as first suggested by Albert Einstein, if by chance, a tiny primordial black hole eclipses a distant star, light rays of the star will bend around the black hole due to gravitational effect, resulting in the star appearing to be brighter than it

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originally is for a short while. Called 'gravitational lensing', this rare phenomena can occur only when the star, the black hole and the observer on the Earth are aligned in a straight line.

- When the black hole is in alignment with a distant star, due to gravitational attraction, light rays are bent inwards like a lens, making the star appear brighter.

Source: ForumIAS factly

**Q.4)** Consider the following statements regarding the "L2 Pro India":

1. It is a website developed by NITI Aayog.
2. It will aid and enable youth, innovators, entrepreneurs in understanding IPRs for their ownership and protection.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** Secretary Department for Promotion of Industry and Internal Trade (DPIIT), launched the website and mobile application [Learn to Protect, Secure and Maximize Your Innovation] on Intellectual Property Rights (IPRs) today in New Delhi.

- The website and app has been developed by Cell for IPR Promotion and Management (CIPAM)-DPIIT in collaboration with Qualcomm and National Law University (NLU), Delhi.
- The modules of this e-learning platform [L2Pro India IP e-learning Platform and the L2Pro India Mobile App] will aid and enable youth, innovators, entrepreneurs and small and medium industries (SMEs) in understanding IPRs for their ownership and protection, integrate IP into business models and obtain value for their R&D efforts.
- The L2Pro has been successfully implemented in Germany, United Kingdom, Italy and France, benefiting immensely from close collaboration with respective IP organizations and public research institutions.
- The learning app has been customized for India in order to ensure that innovation which is fundamental to startups are protected, managed and commercialised.

Source: ForumIAS factly

**Q.5)** Consider the following statements regarding the "National Supercomputing Mission":

1. Mission launched in 12<sup>th</sup> Plan period.
2. It was implemented jointly by Department of Science and Technology (DST) and Department of Electronics and Information Technology (DeitY).

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The Mission, launched in 2015, envisages empowering our national academic and R&D institutions spread over the country by installing a vast supercomputing grid comprising of more than 70 high performance computing facilities.

- The mission would be implemented jointly by Department of Science and Technology (DST) and Department of Electronics and Information Technology (DeitY) through

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two organizations the Centre for Development of Advanced Computing (C-DAC) and the Indian Institute of Science (IISc), Bangalore.

- The Mission envisages empowering our national academic and R&D institutions spread over the country by installing a vast supercomputing grid comprising of more than 70 high-performance computing facilities.

Source: Agraphari

**Q.6)** Consider the following statements regarding the “data localization”:

1. Justice Srikrishna Committee report recommended that the data stored only locally.
2. Currently, the only mandatory rule on data localization in India is by the Reserve Bank of India for payment systems.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Data localisation laws refer to regulations that dictate how data on a nation’s citizens is collected, processed and stored inside the country.

- Among reasons supporting data localisation put out by the Justice Srikrishna Committee report last year, a few key ones are: Data localisation is critical for law enforcement.
- Access to data by Indian law agencies, in case of a breach or threat, cannot be dependent on the whims and fancies, nor on lengthy legal processes of another nation that hosts data generated in India.
- A key observation of the report is that it is ideal to have the data stored only locally, without even having a copy abroad, in order to protect Indian data from foreign surveillance.
- Currently, the only mandatory rule on data localisation in India is by the Reserve Bank of India for payment systems. Other than this, there are only reports or drafts of bills that are yet to be signed into law.
- Among material available in the public domain on data localisation is the white paper that preceded the Justice Srikrishna Committee report, inviting public comments.
- The second piece is the Draft Personal Data Protection Bill, 2018 itself which has specific requirements on cross-border data transfers. This is seen as being more restrictive than the recommendations of the Srikrishna Committee.
- The draft e-commerce policy also has clauses on cross-border data transfer. For example, it suggests that if a global entity’s India subsidiary transfers Indian users’ data to its parent, the same cannot be transferred to a third party even with the user’s consent.

Source: ForumIAS factly

**Q.7)** Consider the following statements regarding “World Food Safety Day (WFSD)”:

1. The first world food safety day was celebrated in 2015.
2. World food safety day 2019 theme was “Food Safety, everyone’s business”.
3. It is organized by Food and Agriculture Organization in collaboration with World Health Organization.

Which of the statements given above is/are correct?

- a) 1 only

- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** The first-ever “World Food Safety Day” adopted by the Food and Agriculture Organization of the United Nations in collaboration with WHO, will be celebrated on 7th of June 2019 under the theme "Food Safety, Everyone's Business".

Source: ForumIAS factly

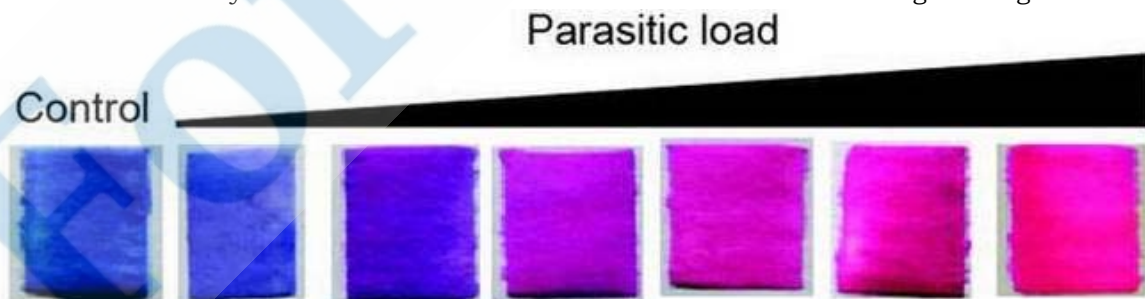
**Q.8)** Recently, which Indian Institute of technology (IIT) has developed a paper based test kit for malaria detection?

- a) Indian Institute of technology (IIT) – Guwahati
- b) Indian Institute of technology (IIT) – Madras
- c) Indian Institute of technology (IIT) – Bombay
- d) Indian Institute of technology (IIT) – Kanpur

**ANS: A**

**Explanation:** With over one million reported cases in 2017, malaria still continues to be a burden for India and most countries of south-east Asia.

- Now, a group of researchers from IIT Guwahati has developed a simple detection method that uses an instrument when in the lab or a piece of chromatographic paper when in the field.
- The kit can be used to detect Plasmodium parasite, which causes malaria and also specifically detect Plasmodium falciparum, a notorious species.
- Using an ordinary syringe fitted with a small magnet, magnetic beads and few chemicals inside, the researchers were able to specifically capture the antigen released by the parasites in the blood of malaria patients.
- When the captured antigens interact with specific substrates inside the syringe, the blue dye turns pink. The dye is then adsorbed over a modified chromatographic paper.
- The formation of pink colour on the paper is a direct indication of the presence of parasites in the blood serum.
- The intensity of the colour increases when the concentration of antigen is high.



**Quantitative detection of malaria with Instrument free approach**

Source: The Hindu

**Q.9)** Consider the following statements:

1. In scram-jet technology, combustion of fuel takes place in a chamber in the missile at supersonic speeds.

2. In ram jet system where the system collects the air it needs from the atmosphere during the flight at subsonic speeds and the propellants burn in the combustion chamber. Which of the statements given above is/are correct?

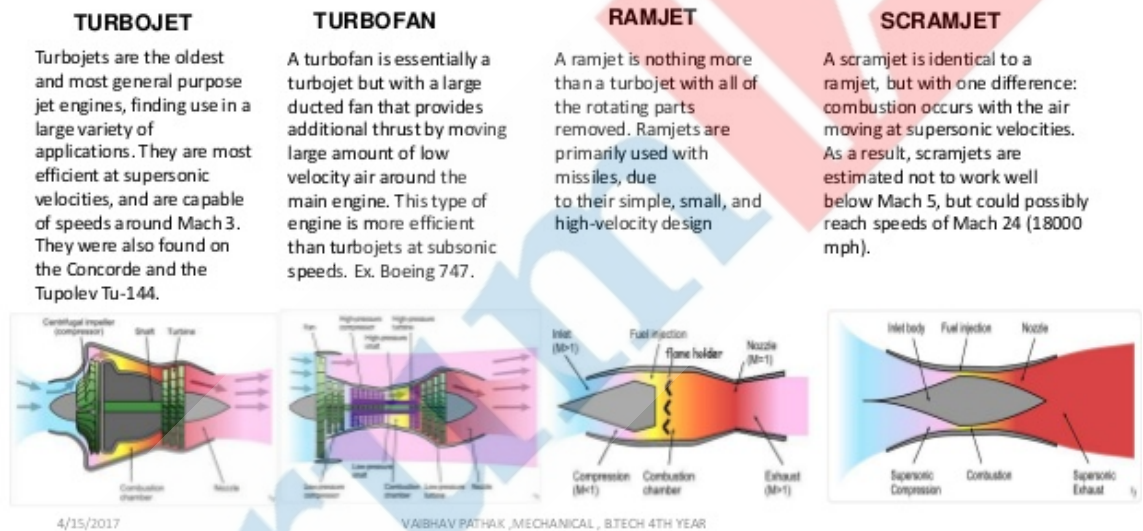
- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** In scram-jet technology, combustion of fuel takes place in a chamber in the missile at supersonic speeds.

This is different from a ram jet system where the system collects the air it needs from the atmosphere during the flight at subsonic speeds and the propellants burn in the combustion chamber.

## TYPES OF ATMOSPHERIC JET ENGINES



Source: ForumIAS factly

**Q.10)** The term “GW190412” is often seen in news is related to which of the following?

- a) Detection of a merger of two unequal-mass black holes.
- b) Bacterial strain that consumes complex aromatic compounds.
- c) It is an asteroid which rotating very near to earth orbit.
- d) A massive west Antarctica ice-sheet.

**ANS: A**

**Explanation:** For the first time since it started functioning, the gravitational wave observatories at LIGO scientific collaboration have detected a merger of two unequal-mass black holes.

- The event, dubbed GW190412, was detected nearly a year ago, and this is almost five years after the first ever detection of gravitational wave signals by these powerful detectors.
- Subsequent analysis of the signal coming from the violent merger showed that it involved two black holes of unequal masses coalescing, one of which was some 30

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times the mass of the Sun and the other which had a mass nearly 8 times the solar mass.

- The actual merger took place at a distance of 2.5 billion light years away.

Source: The Hindu

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## *Awareness in Defence*

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**Q.1)** The “Advanced Technology Vessel (ATV) Project” is related to which of the following?

- a) INS Arihant
- b) Tejas aircraft
- c) Air-craft carrier
- d) Brahmos Missile project

**ANS: A**

**Explanation:** The plan for the Advanced Technology Vessel (ATV) until the late 1980s was to build an SSN - a fast-moving deep-diving nuclear-powered attack submarine, which would hunt surface ships.

- Around the time India leased a Charlie-I class nuclear-powered attack submarine from the Soviet Union, which happened in 1988, planning veered towards building a submarine carrying ballistic missiles.
- The hull design was lengthened and the SSN quietly transformed into an SSBN. The Project code named Advanced Technology Vessel (ATV) Project took 25 years for completion.
- It spawned a new era in the field of cooperation between DRDO, BARC, Navy, PSUs and private industry in which these organizations synergized their efforts to achieve a significant technological and strategic milestone.
- The Arihant class( nuclear-powered ballistic missile submarines)- INS Arihant (S73), INS Aridhaman (S74) are built for the Indian Navy by Navy Shipbuilding Centre, Visakhapatnam.
- The miniaturised naval version of the reactor was designed and built by the Bhabha Atomic Research Centre (BARC) at the Indira Gandhi Centre for Atomic Research (IGCAR) in Kalpakkam.

Source: The Hindu & Agraphari

**Q.2)** Which of the following statements is/are correct about the Airborne Warning and Control System (AWACS)?

1. It is an airborne radar system designed to detect aircraft at short range and command and control, battle space management and communications.
  2. PHALCON AWACS is indigenously developed by DRDO and Centre for Airborne Systems.
- Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** AWACS is distinctive radar domes mounted on the fuselage of the aircraft, which provide the Alliance with air surveillance, command and control, battle space management and communications.

PHALCON AWACS is developed by Israel and it is used by Indian Air Force.

Source: Indian Express

**Q.3)** Consider the following statements regarding the Prithvi-II missile:

1. It is a surface-to-surface tactical missile with a strike range of 350 km.
2. It is capable of carrying 500 to 1,000 kg of warheads, both conventional as well as nuclear.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Prithvi-II missile is a surface-to-surface tactical missile with a strike range of 350 km.

- It is developed by DRDO under Integrated Guided Missile Development Program (IGMDP).
- It is capable of carrying 500 to 1,000 kg of warheads, both conventional as well as nuclear.
- The state-of-the-art missile is powered by liquid propulsion twin engines.
- It uses an advanced inertial guidance system with maneuvering orbit to hit its target.
- It was inducted into armour of the defence forces in 2003.

Source: ForumIAS factly

**Q.4)** The Spike missile is newly acquired from Israel by Indian government is related to which of the following?

- a) Inter Continental Ballistic Missile
- b) Torpedo
- c) Nuclear payload capable missile
- d) Anti-tank missile

**ANS: D**

**Explanation:** The Indian Army successfully tested two newly acquired Spike long-range (LR) anti-tank guided missiles at the Infantry School at Mhow, Madhya Pradesh.

- The Army has recently procured a small batch of 12 launchers and 250 missiles from Israel using its new financial powers to make emergency procurements sanctioned by the Defence Ministry.
- “Spike-LR is a fourth generation missile, which can engage a target with precision at ranges up to 4 km.
- In addition to the fire-and-forget capability, the missile has the ability to fire, observe and update, providing substantial flexibility to the firer to pinpoint the impact point, as also the ability to switch to a different target mid-flight,” the manufacturer, Rafael Advanced Defense Systems, of Israel.

Source: ForumIAS factly

**Q.5)** The term “Losharik”, sometimes seen in news is related to which of the following?

- a) Onshore oil field
- b) Nuclear powered submarine
- c) Arctic Research Vessel
- d) Hypersonic Aircraft

**ANS: B**

**Explanation:** Losharik is a highly advanced nuclear powered submarine of Russia.

- Recently a fire accident was reported on the submarine within the Russian territorial waters.
- It is a deep-diving special mission's ship, operated by the Russian Navy.
- It is capable of withstanding high pressures at great depths, enabling it to survey the ocean floor.

Source: ForumIAS factly

**Q.6)** The "Project 15B" often seen in news is related to which of the following?

- a) Stealth frigates
- b) Stealth guided missile destroyers
- c) Anti-tank guided missiles
- d) Drones

**ANS: B**

**Explanation:** Project 15B is a class of stealth guided missile destroyers.

- Warships built under Project 15Bravo, with a length of 163 metres and 17.4 metres at the beam and a displacement of 7,300 tonnes, are propelled by four gas turbines to achieve speeds in excess of 30 knots.
- Ships under this project can carry and operate two multiple role helicopters.
- Enhanced stealth features have been achieved through the shaping of hull and use of radar transparent deck fittings which make these ships difficult to detect.

Source: The Hindu & Agraphari

**Q.7)** Consider the following statements regarding the NIRBHAY Missile:

1. It is a sub-sonic cruise missile.
2. It has a range of 700 km to 1,000 km.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** NIRBHAY, the long-range, sub-sonic, cruise missile was successfully tested today with a sharper 'terrain hugging capability'.

- The NIRBHAY missile has a range of 700 km to 1,000 km.
- After its launch in typical missile style, it can be controlled in aircraft mode.
- Travelling at sub-sonic speeds of different Mach (speed of sound), the hit capacity is enhanced by control and by homing in on targets at different altitudes.

Source: Agraphari

**Q.8)** The "Project NETRA" is often seen in news is related to which of the following?

- a) Early warning system in space to detect debris
- b) Earth observation satellite constellation system
- c) Early warning system of Tsunamis
- d) Low Altitude Defense System



**ANS: A**

**Explanation:** The Indian Space Research Organisation (ISRO) initiated 'Project NETRA' – an early warning system in space to detect debris and other hazards to Indian satellites.

- The space agency says our SSA (space situational awareness) will first be for low-earth orbits or LEO which have remote-sensing spacecraft.
- Under NETRA, or Network for space object Tracking and Analysis, the ISRO plans to put up many observational facilities: connected radars, telescopes; data processing units and a control centre.
- They can, among others, spot, track and catalogue objects as small as 10 cm, up to a range of 3,400 km and equal to a space orbit of around 2,000 km.

Source: ForumIAS factly

**Q.9)** Which of the following is/are air – craft carriers of India?

1. INS Vikrant
2. INS Viraat
3. INS Vikramaditya

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** INS Vikrant - Initially laid down as HMS Hercules for the British Navy, but construction was put on hold. India purchased the incomplete carrier in 1957, and construction was completed in 1961 and inducted as first aircraft carrier of India.

- It was decommissioned in 1997, scrapped in 2014.
- INS Vikrant (2013) - First domestically built aircraft carrier expected to join service by 2020.
- INS Viraat - A Centaur-class aircraft carrier commissioned in 1959 as the British Navy's HMS Hermes and later sold to India in 1987 and it was decommissioned in 2017.
- INS Vikramaditya - Originally built as Baku for Soviet Navy and it was entered into Indian Navy in 2013.

Source: The Hindu & ForumIAS factly

**Q.10)** The famous “Transition to Triumph” book is related to which of the following defense force of India?

- a) Army
- b) Navy
- c) Air-force
- d) Coastguard

**ANS: B**

**Explanation:** Transition to Triumph book is the history of the Indian navy covers the period from 1965 to 1975.

- Indian Naval history (Transition to Triumph) also records that “by themselves the ships of the Eastern Fleet were too few and too slow to enforce contraband control and help would be needed from Vikrant’s aircraft.
- But the extraordinary extent to which Vikrant’s aircraft actually succeeded in assisting ships in contraband control and apprehending merchant ships, over and

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above their air strikes against East Pakistan, came to be fully realised only after the war.”

Source: The Hindu

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## *Awareness in Biotechnology & IPR*

**Q.1)** Consider the following statements regarding Innovations for Defence Excellence (iDEX):

1. It aims at creation of an ecosystem to foster innovation and technology development in Defence and Aerospace by engaging Industries, MSMEs and start-ups.
2. It is funded by DRDO and NITI aayog.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** Innovations for Defence Excellence (iDEX) was launched by the Government of India in 2018. It is funded and managed by the Defence Innovation Organization (DIO).

- It primarily aims at creation of an ecosystem to foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, start-ups among others.
- It also provides grants/funding to carry out R&D which has good potential for future adoption for Indian defence and aerospace needs.

Source: ForumIAS factly

**Q.2)** “Wasp-76b” is recently in news related to which of the following?

- a) CoVID-19
- b) Exo-planet
- c) Jupiter Moon
- d) Microbial

**ANS: B**

**Explanation:** Recently, Astronomers have observed an exoplanet (planet which orbits a star outside the solar system) named Wasp-76b where they suspect it rains iron instead of water.

- Wasp-76b is an exoplanet that is twice the width of our Jupiter. Its name comes from the UK-led Wasp telescope system that detected it four years ago.
- It is 640 light-years from the Earth and is so close to its star that it takes just 43 hours to complete one revolution.
- According to researchers, the iron rain happens because the exoplanet always presents the same face to the star which is called as tidally locked.
- Earth’s Moon also does exactly the same thing as we only ever see one side.

Source: ForumIAS factly

**Q.3)** Consider the following statements regarding National Intellectual Properties Rights Policy 2016:

1. It aims to promote a holistic and conducive ecosystem to catalyze the full potential of intellectual property for India’s economic growth and development.
2. Department of industrial policy and promotion (DIPP) is the nodal agency for all IPR issues and the policy.

Which of the following below given codes are correct?

- a) 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** It aims to promote a holistic and conducive ecosystem to catalyse the full potential of intellectual property for India's economic growth and socio-cultural development, while protecting public interest.

- The rationale for the National IPR Policy lies in the need to create awareness about the importance of IPRs as a marketable financial asset and economic tool.
- Department of industrial policy and promotion (DIPP) is the nodal agency for all IPR issues and the policy will be renewed every five years in consultation with all the stakeholders.
- The policy will also suggest incentives such as tax benefits and fee waivers to encourage R&D and IP creation to strengthen the Make In India/Start-up/Digital India initiatives.
- To protect 'small inventions' developed especially in the informal / unorganised sectors, policy will promote 'utility patents' (with lower compliance burden and shorter period of protection, when compared to the normal patents) only for mechanical innovations.

Source: PRSIndia

**Q.4)** "UNNATI Programme" launched by which of the following Institution?

- a) ISRO
- b) CSIR
- c) NITI Aayog
- d) All of the above

**ANS: A**

**Explanation:** UNNATI, a capacity building programme on Nanosatellite development, is an initiative by ISRO to commemorate the 50th anniversary of the first United Nations conference on the exploration and peaceful uses of outer space (UNISPACE-50).

- The programme provides opportunities to the participating developing countries to strengthen in assembling, integrating and testing of Nanosatellite.
- UNNATI programme is planned to be conducted for 3 years by U.R. Rao Satellite Centre of ISRO in 3 batches and will target to benefit officials of 45 countries.
- The first batch started today in which 30 delegates from 17 countries are participating.

Source: ISRO

**Q.5)** Consider the following statements regarding Industrial Design (IPR):

1. "Industrial design" title granted by any official authority protects only the non-functional features of an industrial product.
2. The period of protection granted to Industrial Design is from 10 to 25 years.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** An industrial design renders an object attractive or appealing, thus increasing its marketability and adding to its commercial value.

- The design may be three-dimensional based on the shape or surface of the object, or two-dimensional based on the object's patterns, lines or colours.
- Novelty, originality and visual appeal are essential if an industrial design is to be patented, although these criteria can differ from one country to another. Its aesthetic features should not be imposed by the technical functions of the product.
- Legally, "industrial design" is the title granted by an official authority, generally the Patent Office, to protect the aesthetic or ornamental aspect of an object.
- This protects solely the non-functional features of an industrial product and does not protect any technical features of the object to which it is applied.
- Industrial design rights are granted to the creator of designs to reward them for their effort and investment in manufacturing the product. These rights enable the owner to make articles to which the design is applied or in which the design is embodied.
- The holder of this legal title has the exclusive right to make, import or sell any objects to which the design is applied.
- They can authorise others to exploit the design and bring a legal action against anyone using the design without authorisation.
- In general the period of protection granted is from 10 to 25 years. This is often divided into terms and an extension of the term requires renewal of the registration.

Source: Agrahari

**Q.6)** Which of the following is/are provisions of the DNA Technology (Use and Application) Regulation Bill, 2019?

1. DNA testing is allowed to individual identity and civil matters.
2. No consent is required from arrested person for collecting DNA.

Select the correct answer using the codes given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** In a landmark decision, the Lok Sabha passed "The DNA Technology (Use and Application) Regulation Bill - 2019".

- The purpose of this Bill is to expand the application of DNA-based forensic technologies to support and strengthen the justice delivery system of the country. The utility of DNA based technologies for solving crimes, and to identify missing persons, is well recognized across the world.
- By providing for the mandatory accreditation and regulation of DNA laboratories, the Bill seeks to ensure that with the proposed expanded use of this technology in this country, there is also the assurance that the DNA test results are reliable, and furthermore that the data remain protected from misuse or abuse in terms of the privacy rights of our citizens.
- The key components of this Bill include: establishment of a DNA Regulatory Board; accreditation of DNA laboratories undertaking DNA testing, analysing, etc.; establishment of the National and Regional DNA Data Banks, as envisaged in the Bill, will assist in forensic investigations.

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- This will aid in scientific up-gradation and streamlining of the DNA testing activities in the country with appropriate inputs from the DNA Regulatory Board which would be set up for the purpose.
- The Bill will add value in empowering the criminal justice delivery system by enabling the application of DNA evidence, which is considered the gold standard in crime investigations.

Source: PRSIndia

**Q.7)** Next Generation Sequencing (NSG) facility is recently in news is located in which of the following city?

- a) Lucknow
- b) Jaipur
- c) Bangalore
- d) Hyderabad

**ANS: D**

**Explanation:** Union Minister of Health and Family Welfare, Science and Technology and Earth Sciences, Dr Harsh Vardhan inaugurated the Next Generation Sequencing (NSG) facility at the Centre for Cellular and Molecular Biology in Hyderabad today.

- The facility includes technology for high genome sequencing and also diagnostic sequencing of clinical samples.
- The state of art machine, acquired at a cost of Rs. 8 crore can sequence 18,000 samples in 8 minutes.
- The NSG would help prenatal genetic screening and counselling, thereby generating large scale genomic data critical for diagnosis and therapy.

Source: ForumIAS factly

**Q.8)** Which of the following is/are functions of Genetic Engineering Appraisal Committee (GEAC)?

1. To appraise activities involving large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle.
2. To appraise proposals relating to release of genetically engineered organisms and products into the environment including experimental field trials.
3. It has no powers to take punitive action under the Environment Protection Act.

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 3 only

**ANS: D**

**Explanation:** The Genetic Engineering Appraisal Committee (GEAC) functions in the Ministry of Environment, Forest and Climate Change (MoEF&CC).

- As per Rules, 1989, it is responsible for appraisal of activities involving large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle.
- The committee is also responsible for appraisal of proposals relating to release of genetically engineered (GE) organisms and products into the environment including experimental field trials.
- The committee or any persons authorized by it has powers to take punitive action under the Environment Protection Act.

Source: ForumIAS factly

**Q.9)** Which of the following disease (s) is/are covered under The National Vector Borne Disease Control Programme?

1. Malaria
2. Kala-azar
3. Chikungunya

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** Directorate of National Vector Borne Disease Control Programme (NVBDCP) is the central nodal agency for prevention and control of six vector borne diseases (VBDs) i.e. Malaria, Dengue, Lymphatic Filariasis, Kala-azar, Japanese Encephalitis and Chikungunya in India.

- It is part of the Technical Division of the Directorate General of Health Services, Government of India, equipped with Technical Experts in the field of Public Health, Entomology, Toxicology and parasitological aspects of Vector Borne Diseases.
- The Directorate is responsible for framing technical guidelines & policies as to guide the states for implementation of the above mentioned six diseases Programme strategies& is also responsible for budgeting and planning the logistics pertaining to GOI supply.
- Monitoring is done through regular reports and returns of MIS. The Directorate carries out evaluation of Programme implementation activities from time to time.
- The resource gap is also assessed as to provide an equitable support based on the magnitude of the problem and the available resources.

Source: Agrahari

**Q.10)** “Harpoon Capture” is recently in news, is related to which of the following?

- a) Space debris
- b) Deep-Sea fishing
- c) Fossil finding technique
- d) Horticulture

**ANS: A**

**Explanation:** A harpoon designed to capture orbital junk has been successfully tested in space for the first time as part of the active debris-removal demonstration mission called RemoveDebris.

- The pen-size titanium harpoon developed by Airbus engineers in the U.K. was fired into an aluminum target, which extended from the spacecraft attached to a carbon-fiber boom.
- During the test, it successfully snagged the target out of orbit and reeled it back to the main spacecraft.

Source: ForumIAS factly

## *Awareness in Science & Technology*

**Q.1)** Consider the following statements regarding Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI):

1. It is a private limited company with a major share holding of TATA industries
2. It is established with the objective of constructing and commissioning 500 MWe Fast Breeder Reactor (FBR) at Rawatbhata.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI) is a Government Company under the administrative control of the Department of Atomic Energy (DAE) incorporated on 22nd October 2003 as Public Limited Company under the Companies Act, 1956.

With the objective of constructing and commissioning the first 500 MWe Fast Breeder Reactor (FBR) at Kalpakkam in Tamilnadu and to pursue construction, commissioning, operation and maintenance of subsequent Fast Breeder Reactors for generation of electricity in pursuance of the schemes and programmes of Government of India under the provisions of the Atomic Energy Act, 1962.

Source: Agrahari

**Q.2)** Which of the following space agency is launched “PICARD Mission” to monitor the solar diameter, the differential rotation, the solar constant, and to study the long-term nature of their interrelations?

- a) French Space Agency (CNES)
- b) NASA
- c) JAXA
- d) ROSCOSMOS

**ANS: A**

**Explanation:** Picard is a CNES solar-terrestrial microsatellite mission of the Myriade series with French multi-institutional and international cooperation.

- The overall objective is to monitor the solar diameter, the differential rotation, the solar constant (simultaneous measurement of the absolute total and spectral solar irradiance), and to study the long-term nature of their interrelations.
- The mission was named in honor of the 17th century French astronomer Jean Picard (1620-1682), who made the first long-term measurements of the solar diameter, observed sunspots, and determined the rotational velocity of the sun.
- Picard was also the first who accurately measured the length of a degree of a meridian (longitude line) and from that result estimated the size of the Earth.
- Beyond the determination of the Earth orbit eccentricity, the diameter measurements brought important information about the particular state of the sun during the so-called Maunder Minimum [named after E. W. Maunder (1851-1928), an English astronomer who studied solar records of the period 1645-1715], a period showing a quasi absence of sunspots as compared to the early 17th century.



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Source: ForumIAS factly

**Q.3)** Consider the following statements regarding C-17 Globemaster:

1. It is a 4-engine military transport aircraft
2. It is built by Airbus
3. The Indian Air Force has a fleet of 11 C-17 Globemaster IIIs

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 1 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** The C-17 Globe-master military transport aircraft was originally built by Boeing and McDonnell Douglas together for the US Air Force.

- A high-wing, 4-engine, T-tailed military-transport aircraft, the multi-service C-17 can carry large equipment, supplies and troops directly to small airfields in harsh terrain anywhere in the world day or night.
- The Indian Air Force has a fleet of 11 C-17 Globe-master IIIs.

Source: ForumIAS factly

**Q.4)** Consider the following statements regarding Indian Institute of Remote Sensing (IIRS):

1. It is located at Hyderabad.
2. It is a premier institute with the objective of capacity building in Remote Sensing and Geo-informatics

Which of statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** Indian Institute of Remote Sensing (IIRS) at Dehradun is a premier institute with the objective of capacity building in Remote Sensing and Geo-informatics and their applications through education and training programmes at postgraduate level.

- The Institute also hosts and provides support to the Centre for Space Science and Technology Education in Asia and the Pacific (CSSTE-AP), affiliated to the United Nations.
- The training and education programmes of the Institute are designed to meet the requirements of various target / user groups, i.e., for professionals at working, middle and supervisory levels, fresh graduates, researchers, academia, and decision makers. The duration of courses ranges from one week to two years.

Source: Agrahari

**Q.5)** Consider the following statements regarding Yuva Vaigyanik Karyakram (YUVIKA):

1. It was launched by NITI Aayog.
2. It was launched for XI standard students to imparting basic knowledge on Space Technology, Space Science and Space Applications.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only

- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** Indian Space Research Organisation has launched a special programme for School Children called “Young Scientist Programme” “YUva Vigyani KARYakram” (युविका) from the year 2019.

The second session of the programme is scheduled to be held during the month of May 2020.

- The Program is primarily aimed at imparting basic knowledge on Space Technology, Space Science and Space Applications to the younger ones with the intent of arousing their interest in the emerging areas of Space activities.
- The program is thus aimed at creating awareness amongst the youngsters who are the future building blocks of our Nation. ISRO has chalked out this programme to “Catch them young”.
- The programme will be of two weeks duration during summer holidays (May 11-22, 2020) and the schedule will include invited talks, experience sharing by the eminent scientists, facility and lab visits, exclusive sessions for discussions with experts, practical and feedback sessions.
- 3 students each from each State/ Union Territory will be selected to participate in this programme covering CBSE, ICSE and State syllabus.
- 5 additional seats are reserved for OCI candidates across the country. Those who have finished 8th standard and currently studying in 9th standard (in the academic year 2019-20) will be eligible for the programme.
- Students who are studying in India including OCI (Overseas Citizen of India) are eligible for the programme. The selection is based on the 8th Standard academic performance and extracurricular activities.

Source: ForumIAS factly

**Q.6)** Consider the following statements regarding Agni 5 Missile:

1. It is a nuclear-capable ballistic missile developed by DRDO
2. Range of Agni 5 Missile is 8000km

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** India’s defence scientists have successfully launched Agni 5, the nuclear-capable ballistic missile, with over 5,000 km range.

- It is a three stage missile, 17 metres tall, and two metres wide and capable of carrying upto 1.5 tonne of payload, especially nuclear warheads.
- It is developed by labs (DRDO) under the Missile Complex in Hyderabad and several industries across the country were first flight tested in 2012.

Source: ForumIAS factly

**Q.7)** Consider the following statements regarding the Central Drugs Standard Control Organization (CDSCO):

1. It is a central drug authority to implement the directions and orders under Drugs and Cosmetics Act

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2. Major function of CDSCO is regulatory control over approval of new drugs only  
Which of the statements given above is/are **NOT** correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The Central Drugs Standard Control Organization (CDSCO) is the Central Drug Authority for discharging functions assigned to the Central Government under the Drugs and Cosmetics Act.

- CDSCO has six zonal offices, four sub-zonal offices, 13 port offices and seven laboratories under its control. Major functions of CDSCO:
- Regulatory control over the import of drugs, approval of new drugs and clinical trials, meetings of Drugs Consultative Committee (DCC) and Drugs Technical Advisory Board (DTAB), approval of certain licenses as Central License Approving Authority is exercised by the CDSCO headquarters.

Source: CDSCO

**Q.8)** Consider the following statements regarding “Australia Group”:

1. It is a formal forum of countries, seeks to ensure that exports do not contribute to the development of chemical or biological weapons
2. India joined Australia Group in 2008 after signing 123 Agreement with USA

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** The Australia Group (AG) is an informal forum of countries which, through the harmonization of export controls, seeks to ensure that exports do not contribute to the development of chemical or biological weapons.

- Coordination of national export control measures assists Australia Group participants to fulfill their obligations under the Chemical Weapons Convention and the Biological and Toxin Weapons Convention to the fullest extent possible.
- India joined Australia Group in 2018.

Source: ForumIAS factly

**Q.9)** “GLONASS” or Global Navigation Satellite System developed by which of the following country?

- a) USA
- b) China
- c) European Union
- d) Russia

**ANS: D**

**Explanation:** GLONASS is an acronym, which stands for Globalnaya Navigazionnaya Sputnikovaya Sistema, or Global Navigation Satellite System.

- GLONASS is Russia’s version of GPS (Global Positioning System).
- Soviet Union started the development of GLONASS in 1976.

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- GLONASS is the most expensive program of the Russian Federal Space Agency, consuming a third of its budget in 2010.

Source: ForumIAS factly

**Q.10)** Consider the following statements regarding Poly-metallic Nodules:

1. These are commonly called manganese nodules.
2. These are most abundant on abyssal plains at water depths of 4000-6500 metres.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Of all the mineral resources considered as potential targets for deep-sea mining, poly-metallic nodules (also commonly called manganese nodules) are probably the most likely commodity to be developed into a commercial operation.

- Poly-metallic nodules are rounded accretions of manganese and iron hydroxides that cover vast areas of the seafloor, but are most abundant on abyssal plains at water depths of 4000-6500 metres.
- They form through the aggregation of layers of iron and manganese hydroxides around a central particle (such as a shell or small rock fragment), and range in size from a few millimeters to tens of centimeters.
- The composition of nodules varies with their environment of formation, but in addition to manganese and iron, they can contain nickel, copper and cobalt in commercially attractive concentrations as well as traces of other valuable metals such as molybdenum, zirconium and Rare Earth Elements.

Source: ForumIAS factly

## *Other Technological Developments*

**Q.1)** Consider the following statements with regarding benefits of Gene Editing:

1. Treat many human diseases & genetic disorders like HIV/AIDS, hemophilia.
2. It can be used to grow healthier food (via fortification) and increasing harvest.
3. Gene editing can be used to bring to life extinct species.

Which of statements given above is/are correct?

- a) 1, 2 and 3
- b) 1 and 2 only
- c) 1 only
- d) 2 and 3 only

**ANS: A**

**Explanation:** It is a type of genetic engineering in which DNA is inserted, deleted or replaced in the genome of an organism using artificially engineered nucleases, or “molecular scissors”.

- Human genome editing can be used to treat many human diseases & genetic disorders like HIV/AIDS, hemophilia etc.
- It could substantially bolster disease resistance in humans & increase life span.
- It could form the basis of highly efficient & cost effective next generation antibiotics (based on bacteriophage viruses).
- Gene editing can be used to protect endangered species or bring to life extinct species.
- It can be used to grow healthier food (via fortification) and increasing harvest.
- It has the potential to slow down the spread of diseases by eliminating its means of transmission. E.g. Gene editing can be used to introduce sterile mosquitoes into the environment.

Source: Agrahari

**Q.2)** “National Gene Fund” is constituted by Government of India is related to which of the following?

- a) pharmaceuticals
- b) Animal Cloning
- c) Plant varieties
- d) None of the above

**ANS: C**

**Explanation:** The National Gene Fund constituted by Government of India under section 45 of the Plant varieties Act, 2001. Amongst other things, the fund is also utilized for supporting the conservation and sustainable use of genetic resources including in-situ and ex-situ collections.

- As per provisions of section 70 (2)(a) of the PPV&FR Rules, 2003, the Govt. of India in consultation with the Authority instituted the Plant Genome Savior Community Award (five awards of Rs.10 lakhs each).
- This is being awarded since 2009-10, to the farming community / farmers, particularly of the tribal and rural areas engaged in conservation, improvement and preservation of genetic resources of economic plants and their wild relatives in the

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areas of agro-biodiversity hotspots (22 Agro-biodiversity hotspots distributed over 7 agro-ecological zones).

- The Government of India has notified the Protection of Plant Varieties and Farmers Rights (Recognition and Reward from the Gene Fund) Rules, 2012, whereby a farmer who is engaged in the conservation of genetic resources of land races and wild relatives of economic plants and their improvement through selection and preservation shall be entitled to “Plant Genome Saviour Farmer Reward & Farmer Recognition” along with cash prize from National Gene Fund.
- There are 10 rewards each comprising of citation, memento and cash of Rs. One and half lakh each and 20 recognitions each consisting of a cash prize of Rs. One Lakh, citation and memento in a year.

Source: Ministry of Science & Technology

**Q.3)** “Project Kautilya” is related to which of the following?

- a) Financial Reforms
- b) Water Conservation
- c) Electronic Intelligence
- d) River Conservation

**ANS: C**

**Explanation:** According to the Ministry of Defense’s annual report of 2013-14, Kautilya for space-borne ELINT System involves the development of Electronic Intelligence payload for integration on an indigenous mini satellite.

The ELINT includes recordings and analysis of intercepted signals and helps create an RF signature of a radar which can in turn be used for locating and quickly identify the radar in subsequent encounters.

Source: Ministry of Defense

**Q.4)** Consider the following statements regarding New India Space Limited (NISL):

1. It is a joint venture between public and private enterprise.
2. It is under the administrative control of Department of Space

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The Union Government has already set up New Space India Limited (NSIL), a wholly owned Government of India undertaking/ Central Public Sector Enterprise (CPSE), under the administrative control of Department of Space (DOS) on 06th March 2019 to commercially exploit the research and development work of Indian Space Research Organization (ISRO) Centre’s and constituent units of DOS.

Source: Agraphari

**Q.5)** ICESat mission is launched by which of the following space agency?

- a) ISRO
- b) JAXA
- c) European Space Agency
- d) NASA

**ANS: D**

**Explanation:** The Ice, Cloud and land Elevation Satellite-2, or ICESat-2, will measure the height of a changing Earth – one laser pulse at a time, 10,000 laser pulses a second.

- Launched in 2018, ICESat-2 will carry a laser altimeter that detects individual photons, allowing scientists to measure the elevation of ice sheets, sea ice, forests and more in unprecedented detail.
- Our planet's frozen and icy areas, called the cryosphere, are a key focus of NASA's Earth science research.
- ICESat-2 will help scientists investigate why, and how much, our cryosphere is changing in a warming climate.
- The satellite will also measure heights across Earth's temperate and tropical regions, and take stock of the vegetation in forests worldwide.

Source: NASA

**Q.6)** Consider the following statements regarding National Innovation Fund (NIF):

1. It is established with assistance of Department of Science and Technology.
2. Its mission is to help India become a creative and knowledge-based society by expanding policy and institutional space for grassroots technological innovators.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The National Innovation Foundation (NIF) - India was set up in March 2000 with the assistance of Department of Science and Technology, Government of India.

- It is India's national initiative to strengthen the grassroots technological innovations and outstanding traditional knowledge.
- Its mission is to help India become a creative and knowledge-based society by expanding policy and institutional space for grassroots technological innovators.

Source: Agraphari

**Q.7)** Consider the following statements regarding National Initiative for Development and Harnessing Innovations (NIDHI):

1. It is an umbrella program is pioneered by the Department of Science & Technology.
2. One of the key objectives of NIDHI is to promote Student Startups.

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** NIDHI (National Initiative for Development and Harnessing Innovations), an umbrella program is pioneered by the Department of Science & Technology (DST), Government of India, for nurturing ideas and innovations (knowledge-based and technology-driven) into successful startups.

- To take forward student innovations in IEDC / NewGen IEDC programme to commercialization stage.
- To promote student startups.

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- To accelerate the journey of idea to prototype by providing initial funding assistance.
- Source: Agraphari

**Q.8)** Consider the following statements regarding WIPO:

1. It is the global forum for intellectual property (IP) services, policy, information and cooperation.
2. It is a self-funding agency of the United Nations.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** WIPO is the global forum for intellectual property (IP) services, policy, information and cooperation. We are a self-funding agency of the United Nations, with 192 member states.

- WIPO mission is to lead the development of a balanced and effective international IP system that enables innovation and creativity for the benefit of all.
- WIPO mandate, governing bodies and procedures are set out in the WIPO Convention, which established WIPO in 1967.

Source: Agraphari

**Q.9)** Which of the following is covers under TRIPS PLUS provisions?

- a) Automobiles
- b) Marine products
- c) Pharmaceuticals
- d) Data Exclusivity

**ANS: D**

**Explanation:** TRIPs Plus are higher level of protection norms demanded by the developed countries that are not prescribed by the WTO's TRIPs regime.

- Although they are named as 'TRIPs-Plus,' they are not formally related to TRIPs. Rather, the term is used to indicate that these requirements go beyond the minimum standards imposed by TRIPs.
- Many developing countries who are members of FTAs are under pressure to enact these tougher conditions in their patent laws.
- An example for advanced norms under TRIPs Plus is the protection demanded by developed countries for data exclusivity.

Source: The Hindu

**Q.10)** Fast Breeder Test Reactors (FBTR) is located in which of the following place?

- a) Kaiga
- b) Kundankulam
- c) Kalpakkam
- d) Tarapur

**ANS: C**

**Explanation:** Indira Gandhi Centre for Atomic Research (IGCAR) has been carrying out a comprehensive R&D on sodium cooled fast breeder reactor technology for the past 30 years.



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- A test reactor, called Fast Breeder Test Reactors (FBTR), is in operation from 1985 onwards which has provided valuable feedback.
- Based on this experience and also taking into account the international experience, design of a 500MWe Prototype Fast Breeder Reactor (PFBR) has been done.
- The design has been peer reviewed by international design agencies.
- Indigenously produced Mixed Uranium & Plutonium Oxide will be used as the fuel in the Prototype Fast Breeder Reactor at Kalpakkam.

Source: Agrahari

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## *Other Technological Developments*

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**Q.1)** Consider the following statements regarding the “Primordial Black Holes”:

1. PBHs were formed during the Hot Big Bang phase.
2. PBH can be massively large as 3000kms or be extremely tiny like nucleus of an atom.

Which of the following statements given above is/are NOT correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** Primordial Black Holes (PBH) were formed during the Hot Big Bang phase.

- PBH can be massively large as 3000kms or be extremely tiny like nucleus of an atom.
- It is believed that they are formed as a result of collapsing radiations as opposed to the collapse of massive stars, which is the case of any other black holes.
- A recent study on Primordial black holes has confirmed that this marginal rise in potential energy resulted in birth of several PBHs and also emitted very powerful gravitational waves.
- Inter University Centre for Astronomy and Astrophysics (IUCAA), has studied primordial black holes that were born as a result of a tiny bump in the potential energy levels of the universe, at a time when it was expanding rapidly.

Source: The Hindu

**Q.2)** The “Artemis (human spaceflight programme)” is recently in news is launched by which of the following space agency?

- a) European Space agency
- b) Roscosmos
- c) NASA
- d) JAXA

**ANS: C**

**Explanation:** The Artemis program is a US (NASA) government-funded crewed spaceflight program that has the goal of landing "the first woman and the next man" on the Moon, specifically at the lunar South Pole region by 2024.

Source: The Hindu

**Q.3)** The X-ray Polarimeter Satellite (XPoSat) is a planned space observatory to study polarization of cosmic X-rays – is going to launch by which of the following agency?

- a) ISRO
- b) NASA
- c) JAXA
- d) Both A and B

**ANS: A**

**Explanation:** The X-ray Polarimeter Satellite is a planned space observatory to study polarisation of cosmic X-rays.

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- It is planned to be launched in 2021, and to provide a service time of at least five years.
- The telescope is being developed by the Indian Space Research Organisation (ISRO) and the Raman Research Institute.

Source: Indian Express

**Q.4)** Which of the following country is NOT a member of Quadrilateral Security Dialogue (QSD, also known as the Quad)?

- a) Japan
- b) South Korea
- c) Australia
- d) United States of America

**ANS: B**

**Explanation:** The Quadrilateral Security Dialogue (QSD), better known as the 'Quad', started as a strategic dialogue in 2007.

- The dialogue members included India, the US, Australia and Japan.
- It was established to check the growth of Chinese power in what was still referred to as 'Asia-Pacific', and which has since become 'Indo-Pacific'.
- The Quad had its real genesis in the response to the 2004-2005 Asian Tsunami when India showed prowess in spearheading the relief and rescue effort in South East Asia.
- However, the principal aim of the Quad was strategic, with a quest to manage the consequences for the regional balance of power in the Indo-Pacific due to the scale and scope of China's rise.

Source: The Hindu

**Q.5)** Which of the following pair (s) is/are NOT correctly matched?

- | Operation                 | : | Associated with                 |
|---------------------------|---|---------------------------------|
| 1. Operation Samudra Setu | : | Repatriation of Indian citizens |
| 2. Operation Sanjeevani   | : | Gulf of Oman                    |
| 3. Operation Sankalp      | : | Maldives                        |

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** Indian Navy has launched Operation Samudra Setu - meaning Sea Bridge, as a part of national effort to repatriate Indian citizens from overseas.

- Under Operation Sanjeevani an Indian Air Force (IAF) C-130J transport aircraft delivered 6.2 tons of essential medicines and hospital consumables to Maldives.
- Indian Navy launched Operation Sankalp in the Persian Gulf and the Gulf of Oman on Thursday to reassure Indian flagged vessels transiting through the area following the recent maritime incidents in the region.

Source: The Hindu

**Q.6)** Which of the following pair (s) is/are correctly matched?

- | Missile /Defense system | : | Origin Country |
|-------------------------|---|----------------|
| 1. Spike Missile        | : | Israel         |

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2. Tsirkon missile : Russia  
3. Maareech torpedo defense system : India

Select the correct answer using the code given below:

- a) 1 only  
b) 1 and 2 only  
c) 2 and 3 only  
d) 1, 2 and 3

**ANS: D**

**Explanation:** Russian administration announced on Russian Navy would be equipped with hypersonic nuclear strike weapons and underwater nuclear drones.

- Tsirkon hypersonic cruise missile is designed to be carried on surface ships; it is under final phase of testing.

**Spike Missile:** Spike is an Israeli fire-and-forget anti-tank guided missile and anti-personnel missile.

- It was developed and designed by the Israeli company Rafael Advanced Defense Systems.

**Maareech torpedo defense system:** It is an Advanced Torpedo Defence System (ATDS) that is capable of being fired from all frontline ships.

- It has been designed and developed indigenously by DRDO.
- It is capable of detecting, locating and neutralizing incoming torpedoes.

Source: Indian Express & ForumIAS

**Q.7)** Consider the following statements regarding the “project AHANA”:

1. It is a flagship national programme, is working for a world where no child is born with HIV/Acquired Immunodeficiency Syndrome (AIDS).
2. It is implemented by National AIDS Control Organization (NACO) with the support of World Health Organization.

Which of the statements given above is/are correct?

- a) 1 only  
b) 2 only  
c) Both 1 and 2  
d) Neither 1 nor 2

**ANS: A**

**Explanation:** AHANA, a flagship national programme, is working for a world where no child is born with HIV/Acquired Immunodeficiency Syndrome (AIDS).

- It focuses on the elimination of mother-to-child transmission of HIV and is implemented by Plan India with support from The Global Fund.
- AHANA is being implemented in close coordination with the National AIDS Control Organisation (NACO) and National Health Mission (NHM) to influence policies and strategies in both the design and implementation phases of the National Health Mission Programme.
- AHANA aims to cover 55% of India’s annual pregnancy load and reach 16.5 million annual pregnancies across 357 districts in 14 states each year with HIV testing.
- AHANA also provides care and support to HIV exposed babies until they are 18 months old, along with facilitating postpartum care for the lactating mother.

Source: The Hindu & ForumIAS

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**Q.8)** Consider the following statements regarding the “National Biopharma Mission”:

1. It is an Industry-Academia Collaborative Mission of Department of Biotechnology (DBT).
2. It is co-funded by the Asian Development Bank and is being implemented at Biotechnology Research Assistance Council (BIRAC).

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** National Biopharma Mission is an Industry-Academia Collaborative Mission of Department of Biotechnology (DBT).

- It aims for accelerating discovery research to early development for Bio pharmaceuticals approved by the Cabinet for a total cost US\$ 250 million.
- It is 50% co-funded by the World Bank is being implemented at Biotechnology Research Assistance Council (BIRAC).
- This program is dedicated to deliver affordable products to the nation with an aim to improve the health standards of India’s population.

**Q.9)** Consider the following statements regarding “INS Arihant”:

1. It is India’s first indigenously built nuclear submarine.
2. It is a ship submersible ballistic, nuclear (SSBN) submarine.
3. French designers assisted in building the Arihant.

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 3 only

**ANS: B**

**Explanation:** INS Arihant is India’s first nuclear-powered submarine.

- The ship submersible ballistic, nuclear (SSBN) submarine was launched at the Indian Navy’s dockyard in Visakhapatnam, which is the headquarters of India’s Eastern Naval Command.
- Indian Prime Minister Manmohan Singh, who has inaugurated the vessel into the Indian Navy, asserted that the indigenously built submarine would be used for self defence.
- The name Arihant derives from two words – Ari meaning enemy and Hanth meaning destroy.
- Arihant, India’s first indigenously built nuclear submarine, cost \$2.9bn.
- It was jointly developed by the Indian Navy, Bhabha Atomic Research Centre (BARC) and Defence Research and Development Organisation (DRDO) at the naval dockyard in Visakhapatnam.
- Russian designers assisted in building the vessel.

Source: The Hindu

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**Q.10)** Consider the following statements regarding “Lithium”:

1. It has the lowest density of all metals.
2. It is used in rechargeable batteries for mobile phones, laptops, digital cameras and electric vehicles.
3. Lithium is abundantly available in India.

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 1 and 2 only
- c) 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** Lithium is an alkali metal. It has the lowest density of all metals.

- The most important use of lithium is in rechargeable batteries for mobile phones, laptops, digital cameras and electric vehicles.
- But as well as the lithium-ion batteries for which it has grown in popularity, the highly reactive and flammable alkali mineral – sometimes referred to as “white gold” – is also used in ceramics and glass, lubricating greases, polymer production, and air treatment.
- According to the latest figures from the US Geological Survey (USGS), global lithium production in 2018 reached around 85,000 tonnes – up from 69,000 in the previous year.
- Continued exploration efforts have seen global lithium resource estimates reach 62 million tonnes – a significant proportion of which are located in South America’s “lithium triangle” – an area encompassing Chile, Argentina and Bolivia.
- India currently imports all its lithium needs.
- It imported lithium batteries worth \$1.2 billion in fiscal 2019, up from \$384 million in FY17.
- Recently researchers at the Atomic Minerals Directorate, a unit of India’s Atomic Energy Commission, have estimated lithium reserves of 14,100 tonnes in a patch of land surveyed in Mandya, 100 km from Bengaluru.

Source: The Hindu

## *Indian Society & Welfare*

**Q.1)** Which of the following is/are correctly matched?

Organization	:	Founder/President
1. South India Liberal Federation	:	C N Annadurai
2. Bahishkrit Hitkarni Sabha	:	Jyotirao Phule
3. Sree Narayana Dharma Paripalana Yogam	:	Narayana Guru

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 only
- d) 3 only

**ANS: D**

**Explanation:** The Justice Party, earlier South Indian Liberal Federation, was a political party in the Madras Presidency of British India. It was established in 1916 by Natesa Mudaliar and co-founded by T. M. Nair and P. Theagaraya Chetty as a result of a series of non-Brahmin conferences and meetings in the presidency.

- Bahishkrit Hitakarini Sabha is a central institution formed by Dr. Babasaheb Ambedkar for removing difficulties of the untouchables and placing their grievances before government.
- S.N.D.P. means Sri Narayana Guru Dharma Paripalana Yogam or sangam. Narayana Guru through his socio religious teachings and writings has become so famous in the socio-religions and political scenario of Kerala during 19th century that all the young people turned towards the reformative movements of Sri Narayana Guru and voluntarily they have redesignated their former youth association (it's called Vivatu sangha) as S.N.D.P. It was registered as a joint stock company in January 1903 with Sri Narayana Guru as life time president.

Source: NCERT

**Q.2)** The Prerana MyTree, an eco-initiative by students is started in which of the following state?

- a) Kerala
- b) Karnataka
- c) West Bengal
- d) Odisha

**ANS: B**

**Explanation:** In the wake of 16-year-old Greta Thunberg's call for standing up for climate action, students all over the world are heeding her clarion call.

- On Children's Day, students in Bengaluru and Karnataka are doing their bit for the environment by planting trees.
- Prerana MyTree, an eco-initiative by students from 48,000 government schools across Karnataka will plant about 2.5 lakh trees across the state.
- Prerana MyTree is supported by the state government, the NGO Sikshana Foundation, Dell and Bengaluru-based startup, Eyeris Media.

Source: The Hindu

**Q.3)** The term Principle of Non-Refoulement often seen in news is related to which of the following?

- a) Economic offender
- b) Refugees
- c) Right to property
- d) Polluter pay principle

**ANS: B**

**Explanation:** Non-refoulement is a fundamental principle of international law.

- It prohibits states from forcibly returning refugees to conditions that caused them to flee their homes in the first place, where they would be likely in danger of persecution based on race, religion, nationality, membership of a particular social group or political opinion.
- It is also in charge of the exchequer control and internal audits.

Source: The Hindu

**Q.4)** Which of the following pair (s) is/are NOT correctly matched?

Organization	:	Founder
1. Dharma Sabha	:	Raja Radhakant Deb
2. Tattvabodhini Sabha	:	Rabindranath Tagore
3. Brahmo Samaj of India	:	Rammohan Roy

Select the correct answer using the codes given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** Dharma Sabha: The orthodox Hindu led by Raja Radhakant Deb organised the 'Dharma Sabha' with the object of countering the propaganda of BrahmoSamaj.

- Tatvabodhini Sabha: Debendranath Tagore, father of Rabindranath Tagore founded the Tatvabodhini Sabha in 1839 to propagate Rammohun Roy's ideas. The Tatvabodhini Sabha and its organ the Tatvabodhini Patrika promoted a systematic study of India's past in Bengali language and helped spread rational outlook.
- Brahmo Samaj of India: Keshubsen and his followers broke away from Brahmo samaj in 1866 and established what was called the 'Brahmo Samaj of India'.

Source: e-gyankosh

**Q.5)** The "Global Social Mobility Index" is released by which of the following International Institution?

- a) UNESCO
- b) United Nations Development Programme (UNDP)
- c) World Economic Forum (WEF)
- d) UNICEF

**ANS: C**

**Explanation:** India has been ranked very low at 76th place out of 82 countries on a new Social Mobility Index compiled by the World Economic Forum, while Denmark has topped the charts.

The report, released ahead of the 50th Annual Meeting of the WEF, also lists India among the five countries that stand to gain the most from a better social mobility score that seeks



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to measure parameters necessary for creating societies where every person has the same opportunity to fulfill his potential in life irrespective of socioeconomic background.

Source: The Hindu

**Q.6)** Consider the following statements regarding the World Population Prospects 2019 report:

1. It is published and released by United Nations (UN).
2. According to the report, India is projected to overtake China as the world's most populous country by 2050.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** The key message from the UN's World Population Prospects 2019 report is that national leaders must redouble their efforts to raise education, health and living standards for people everywhere.

- India is projected to become the most populous country by 2027 surpassing China, and host 1.64 billion people by 2050;
- The world as a whole could be home to 8.5 billion people in just over a decade from now, and the number could go up to 9.7 billion by mid-century.
- The largest increases in population between 2019 and 2050 will take place in: India, Nigeria, Pakistan, the Democratic Republic of the Congo, Ethiopia, the United Republic of Tanzania, Indonesia, Egypt and the United States of America (In descending order of the expected increase).
- The UN report shows migration to countries with a falling ratio of working-age people to those above 65 will be steady, as those economies open up to workers to sustain economic production.
- Japan has the lowest such ratio, followed by Europe and the Caribbean; in over three decades, North America, Eastern and Southeastern Asia will join this group.
- India meanwhile will have a vast number of young people and insufficient natural resources left for exploitation. Preparing for the changes and opportunities migration offers will depend on a skills revolution.

Source: The Hindu

**Q.7)** According to the International Labour Organization (ILO) report, working on a warmer planet: The impact of heat stress on labour productivity and decent work, which of the following sector is the most affected?

- a) Agriculture sector
- b) Manufacturing sector
- c) Construction business
- d) Service sector

**ANS: A**

**Explanation:** According to the International Labour Organization (ILO) report, Working on a warmer planet: The impact of heat stress on labour productivity and decent work, Globally two sectors projected to be hit worst are agriculture and construction, with agriculture worse affected.

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- The ILO says 940 million people around the world work in the agricultural sector, which is projected to account for 60% of working hours lost due to heat stress by 2030.
- In construction, an estimated 19% of global working hours are likely to be lost.

Source: The Hindu

**Q.8)** Which of the following indicators used by Global Hunger Index for ranking countries?

1. Undernourishment
2. Child wasting
3. Child stunting
4. Child mortality

Select the correct answer using the code given below:

- a) 1, 2 and 3 only
- b) 2 and 3 only
- c) 2, 3 and 4 only
- d) 1, 2, 3 and 4

**ANS: D**

**Explanation:** The 14th Global Hunger Index (GHI) 2019 was released recently and it had ranked India a lowly 102 among the 117 countries it had mapped.

- The GHI has been brought out almost every year by Welthungerhilfe (lately in partnerships with Concern Worldwide) since 2000.
- A low score gets a country a higher ranking which implies a better performance.
- The reason for mapping hunger is to ensure that the world achieves –Zero Hunger by 2030 - one of the Sustainable Development Goals of the United Nations.

Four indicators of GHI –

- Undernourishment (which reflects inadequate food availability)
- Child Wasting (which reflects acute under nutrition)
- Child Stunting (which reflects chronic under nutrition)
- Child Mortality (which reflects both inadequate nutrition and unhealthy environment)

Source: The Hindu

**Q.9)** The “Nagpur Resolution” is often seen in news is related to which of the following?

- a) Green corridors
- b) Public participation
- c) Organic farming
- d) Electoral reforms

**ANS: B**

**Explanation:** Nagpur Resolution is a holistic approach for empowering citizens adopted during regional conference organized by DARPG in Nagpur.

- The conference was organized by the Department of Administrative Reforms and Public Grievances (DARPG), in collaboration with the Government of Maharashtra.
- The resolution aims to empower the citizens by policy interventions for better service delivery through timely updating of citizens charters, implementation of enactments and benchmarking standards for continuous improvement.
- It also aims to ensure timely publication of Good Governance Index to identify the quality of governance in 10 sectors especially those pertaining to welfare and infrastructure at the Union, State and District levels.

Source: ForumIAS factly

**Q.10)** The “Spandana initiative” is often seen in news is related to which of the following state?

- a) Tamil Nadu
- b) Kerala
- c) West Bengal
- d) Andhra Pradesh

**ANS: D**

**Explanation:** It is an initiative of Andhra Pradesh Government to make police stations more approachable for the public, especially women.

- Spandana (means response) centers have been established within the premises of all District Collector offices and police stations.
- These centers mostly have a female receptionist and other staff members who are trained, briefed and sensitized in handling women victims and complainants.
- Spandana centres spread across the district, and each have video conferencing facility, it is easier and cheaper for people to lodge complaints.

Source: The Hindu

## Revision

**Q.1)** With respect to World Economic Forum's Global Gender Gap Report 2020, India has improved its ranking in which of the following indicators?

- Political Empowerment
- Health and survival
- Educational attainment
- Economic participation

**ANS: A**

**Explanation:** Global Gender Gap Report, 2020 by World Economic Forum benchmarks 153 countries on their progress towards gender parity across four thematic dimensions:

- Economic Participation and Opportunity
- Educational Attainment
- Health and Survival, and
- Political Empowerment.

India slipped four places to 112th rank and has closed two-thirds of its overall gender gap (score of 66.8%).

While India has improved in political empowerment, it has fallen in other three indicators.

India is the only country among the 153 countries studied where the economic gender gap is larger than the political one.

Source: ForumIAS factly

**Q.2)** Consider the following statements regarding the Commission on the Status of Women (CSW):

1. It is the principal global intergovernmental body exclusively dedicated to the promotion of gender equality and the empowerment of women.
2. It is a functional commission of ECOSOC.
3. It monitors and reviews the progress and problems in the implementation of the Beijing Declaration and Platform for Action.

Which of the statements given above is/are correct?

- 1 only
- 1 and 2 only
- 2 and 3 only
- 1, 2 and 3

**ANS: D**

**Explanation:** Commission on the Status of Women (CSW).

- The Commission on the Status of Women (CSW) is the principal global intergovernmental body exclusively dedicated to the promotion of gender equality and the empowerment of women.
- A functional commission of the Economic and Social Council (ECOSOC), it was established by ECOSOC resolution 11(II) of 21 June 1946.
- The CSW is instrumental in promoting women's rights, documenting the reality of women's lives throughout the world, and shaping global standards on gender equality and the empowerment of women.
- In 1996, ECOSOC in resolution 1996/6 expanded the Commission's mandate and decided that it should take a leading role in monitoring and reviewing progress and

problems in the implementation of the Beijing Declaration and Platform for Action, and in mainstreaming a gender perspective in UN activities.

Source: Laxmikanth

**Q.3)** Consider the following statements regarding the provisions of the Protection of Children from Sexual Offences (POCSO) Act:

1. The Act defines a child as any person below sixteen years of age.
2. It is a gender neutral law.
3. It recognizes consensual sexual acts among children or between a child and an adult.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** To deal with child sexual abuse cases, the Government has brought in a special law, namely, The Protection of Children from Sexual Offences (POCSO) Act, 2012. The Act has come into force with effect from 14th November, 2012 along with the Rules framed there under.

Provisions of the Protection of Children from Sexual Offences (POCSO) Act:

- The Act defines a child as any person below eighteen years of age and regards the best interests and well-being of the child as being of paramount importance at every stage, to ensure the healthy physical, emotional, intellectual and social development of the child.
- It defines different forms of sexual abuse, including penetrative and non-penetrative assault, as well as sexual harassment and pornography, and deems a sexual assault to be “aggravated” under certain circumstances, such as when the abused child is mentally ill or when the abuse is committed by a person in a position of trust or authority vis-à-vis the child, like a family member, police officer, teacher, or doctor
- It also seeks to establish Special Courts for speedy trial of such offences. The Act stipulates that a case of Child Sexual Abuse must be disposed of within one year from the date the offence is reported.
- It also provides for relief and rehabilitation of the child, as soon as the complaint is made. The Special Juvenile Police Unit or the local police are also required to report the matter to the Child Welfare Committee within 24 hours of recording the complaint, for long term rehabilitation of the child.
- It is gender neutral law, wherein the law takes cognizance of sexual crimes committed against both girls and boys under the age of 18 years.
- It does not recognize consensual sexual acts among children or between a child and an adult. Prosecutes any person (including a child) for engaging in a sexual act with a child irrespective of whether the latter consented to it.

Source: ForumIAS factly

**Q.4)** The “Hague Convention” is related to which of the following?

- a) Child adoption
- b) Women empowerment
- c) International Justice
- d) None

**ANS: A**

**Explanation:** The Hague Convention protects children and their families against the risks of illegal, irregular, premature or ill-prepared adoptions abroad. To do this, the Hague Convention puts:

- safeguards in place to make sure that all inter-country adoptions are in the best interests of the child and respects their human rights,
- a system in place of cooperation among countries to guarantee that these safeguards are respected, and to prevent the abduction of, sale of, or traffic in children.

For Hague adoptions, the authorities in both countries must agree to go ahead with the adoption. For non-Hague adoptions, requirements may vary from one country to another.

The Hague Convention does not allow private adoptions in the child's home country.

Source: The Hindu

**Q.5) NATIONAL LEGAL SERVICES AUTHORITY (NALSA) VS UNION OF INDIA case is related to which of the following?**

- a) Sexual harassment at work place
- b) Domestic violence
- c) Transgender
- d) Child rights

**ANS: C**

**Explanation:** NATIONAL LEGAL SERVICES AUTHORITY (NALSA) VS UNION OF INDIA case was filed by the NALSA to legally recognize persons who fall outside the male/female gender binary, including persons who identify as “third gender”.

- This was a landmark decision where the apex court legally recognised “third gender”/transgender persons for the first time and discussed “gender identity” at length.
- The Court recognised that third gender persons were entitled to fundamental rights under the Constitution and under International law.
- Further, it directed state governments to develop mechanisms to realise the rights of “third gender”/transgender persons.

Source: Laxmikanth

**Q.6) The term “Bandicoot” is related to which of the following?**

- a) Child labour Alert system
- b) Man-hole cleaning robot
- c) Risk alert app for women
- d) None

**ANS: B**

**Explanation:** Bandicoot is a robotic system for manhole and sewer line cleaning aimed at the complete elimination of manual scavenging from the face of earth.

The Greater Hyderabad Municipal Corporation (GHMC) in 2019 procured a 'Bandicoot', which would help end the practice of manual scavenging.

Source: The Hindu

**Q.7) The term “Total Polar Compounds” is often seen in news is related to which of the following?**

- a) Edible oils
- b) Crude oil

- c) Ocean deposits
- d) Cosmetics and Shampoos

**ANS: A**

**Explanation:** During frying, oil undergoes degradation due to their exposure to elevated temperatures which result in changes in the physico-chemical, nutritional and sensory properties of the oil.

- Polar compounds are formed during frying.
- The toxicity of these compounds is associated with several diseases such as hypertension, atherosclerosis, Alzheimer's disease liver diseases etc.
- Therefore, it is essential to monitor the quality of vegetable oils during frying.
- In order to safeguard consumer health, FSSAI has fixed a limit for Total Polar Compounds at 25% beyond which the vegetable oil shall not be used. Therefore, Vegetable Oils should not be repeatedly used for frying.
- The estimation of Total Polar Compounds (TPC) is a widely accepted parameter to decide whether the oil is safe for further use or not.
- The TPC Value is considered a better indicator since it refers to all degraded products from the initial triglycerides present in the oil.

Source: The Hindu

**Q.8)** Consider the following statements regarding the “five-day annual International Pulsar Timing Array (IPTA) meet”:

1. It is hosted by Pune based National Centre for Radio Astrophysics (NCRA).
2. The IPTA is a collaboration of radio astronomers from a dozen countries across the globe.
3. It uses more than 12 radio telescopes all over the world with an aim to detect ultra-low frequency gravitational waves.

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** The Pune-based National Centre for Radio Astrophysics (NCRA) is all set to host the five-day annual International Pulsar Timing Array (IPTA) meet from June 17 to 21.

- The IPTA is a collaboration of radio astronomers from a dozen countries across the globe.
- It uses more than 12 radio telescopes all over the world with an aim to detect ultra-low frequency gravitational waves.
- More than 40 expert international astronomers and 30 international students are expected to participate in the event, besides several Indian participants.
- “The upgrade of the Giant Metrewave Radio Telescope (GMRT) in Pune and the Ooty Radio Telescope (ORT) has helped us meet the parameters for being a full member of the IPTA.
- The current status of the quest for ultra-low frequency Gravitational Waves and the roadmap for future technical and scientific challenges is to be the main focus of the meeting.
- These waves are wrinkles in space-time produced by two massive black holes, each revolving around the other.
- Such black holes, which weigh billion times more than our Sun, are found in the centres of colliding galaxies.

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- These waves affect radio pulses from 10km size stars called radio pulsars by changing ever so slightly the period of radio pulsation of these stars.

Source: Indian Express

**Q.9)** Consider the following statements regarding “Cell for IPR Promotion and Management (CIPAM)”:

1. It is a professional body which ensures focused action on issues related to IPRs.
2. It works under Department of Science & Technology.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** A professional body under the aegis of Department for Promotion of Industry and Internal Trade (DPIIT) which ensures focused action on issues related to IPRs and addresses the 7 identified objectives of the policy.

- CIPAM assists in simplifying and streamlining of IP processes, apart from undertaking steps for furthering IPR awareness, commercialization and enforcement.
- Simplifying and streamlining of IP processes by formulating and implementing a focused strategy for each policy objective
- Coordination with State level agencies and Ministries/ Departments of the Government of India, industry bodies as well as international agencies; IP cells to be set up
- IPR awareness campaign across the country in schools,colleges/universities and the industry
- Training and sensitization programmes for enforcement agencies and Judiciary; coordination for effective enforcement of IPR rights.
- Study and facilitate implementation of best practices for promotion and commercialization of IP within the country

Source: ForumIAS factly

**Q.10)** “Lunar X Prize” is recently in news is sponsored by which of the following social media giant?

- a) Face Book
- b) Google
- c) YouTube
- d) Twitter

**ANS: B**

**Explanation:** The Google Lunar XPRIZE (GLXP), sometimes referred to as Moon 2.0, was a 2007–2018 inducement prize space competition organized by the X Prize Foundation, and sponsored by Google.

The challenge called for privately funded teams to be the first to land a robotic spacecraft on the Moon, travel 500 meters, and transmit back to Earth high-definition video and images.

Source: The Hindu



## *Society & Welfare*

**Q.1)** The “Ananthsayanam Ayyangar Committee, Justice Venkatchaliah Commission, Balkrishna Sidke Renke and Idate Commission” related to which of the following?

- a) De-notified tribes
- b) Education
- c) Primary health
- d) Rural women empowerment

**ANS: A**

**Explanation:** The committees/commissions related to De-notified/criminal tribes.

- The Ananthsayanam Ayyangar Committee (gave a comprehensive report on how CTA worked throughout India), the CTA was repealed in August 1949 and former “criminal tribes” were de-notified in 1952, when the Act was replaced with the Habitual Offenders Act, 1952 of Government of India.
- In 2002, Justice Venkatchaliah Commission recommended for strengthening the programmes for economic and educational development of De-Notified Tribes (DNTs).
- National Commission for De-notified Nomadic and Semi-Nomadic Tribes was constituted in 2005 under the chairmanship of Balkrishna Sidke Renke, to study the socio-economic conditions of these groups.
- Another National Commission for De-notified Nomadic and Semi-Nomadic Tribes chaired by Bhiku Ramji Idate was constituted in 2015 for a three-year period. It submitted its report viz “Voices of the Denotified, Nomadic & SemiNomadic Tribes” in 2018.

Source: The Hindu

**Q.2)** Consider the following statements regarding the Higher Education Financing Agency (HEFA):

1. It is a not-profit banking agency established in 2017.
2. It is established to mobilise extra-budgetary resources for building crucial infrastructure in the higher educational institutions under Central Government.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** HEFA has been set up on 31st May 2017 by the Central Government as a non-profit, Non-Banking Financing Company (NBFC). HEFA was established to mobilize extra-budgetary resources for building crucial infrastructure in the higher educational institutions under Central Government.

NOTE: The Government has approved the authorised equity capital expansion of Higher Education Financing Agency (HEFA) to Rs. 10,000 crore, with Government equity of Rs. 6000 crore.

- An amount corresponding to 10% of the Government equity would be contributed by the partner institution, Canara Bank.

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- All Centrally Funded Educational Institutions in Higher Education, School Education and Medical Education sectors are eligible to avail of loans through HEFA.

Source: ForumIAS factly

**Q.3)** Consider the following statements regarding the objectives of Revitalizing Infrastructure and Systems in Education (RISE) by 2022:

1. Qualitatively upgrade the research and academic infrastructure in India to global best standards by 2022.
2. To create separate Institutes of National Importance for girls.
3. To cater to the requirements of the Kendriya Vidyalayas and Navodaya Vidyalayas, and medical institutions like AIIMSs in a faster time frame.

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 3 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** The RISE by 2022 is an attempt to translate the objectives into action plan by making available resources from the market. The objectives of RISE by 2022 are:

- Qualitatively upgrade the research and academic infrastructure in India to global best standards by 2022.
- Make India into an education hub by making available high quality research infrastructure in Indian higher educational institutions.
- To allow access of HEFA funding to institutions like Central Universities, AIIMS, IISERs and newly created Institutes of National Importance, without creating any additional burden to the students.
- To bring greater accountability and speed in execution of infrastructure projects and avoid all cost/time over-runs, moving from the block-grant mode to project-mode for all infrastructure projects.
- To cater to the requirements of the Kendriya Vidyalayas and Navodaya Vidyalayas, and medical institutions like AIIMSs in a faster time frame.

Source: Indian Express

**Q.4)** Consider the following statements regarding the report “Healthy States, Progressive India”:

1. It was prepared by NITI Aayog with the help of United Nations Development Programme (UNDP).
2. It ranks states and Union territories innovatively on their year-on-year incremental change in health outcomes.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The report has been developed by NITI Aayog, with technical assistance from the World Bank, and in consultation with the Ministry of Health and Family Welfare.

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It ranks states and Union territories innovatively on their year-on-year incremental change in health outcomes, as well as, their overall performance with respect to each other.

Source: NITI Aayog

**Q.5)** Consider the following statements regarding the World Population Prospects 2019 report:

1. It is published and released by United Nations (UN).
2. According to the report, India is projected to overtake China as the world's most populous country by 2050.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** The key message from the UN's World Population Prospects 2019 report is that national leaders must redouble their efforts to raise education, health and living standards for people everywhere.

- India is projected to become the most populous country by 2027 surpassing China, and host 1.64 billion people by 2050;
- The world as a whole could be home to 8.5 billion people in just over a decade from now, and the number could go up to 9.7 billion by mid-century.
- The largest increases in population between 2019 and 2050 will take place in: India, Nigeria, Pakistan, the Democratic Republic of the Congo, Ethiopia, the United Republic of Tanzania, Indonesia, Egypt and the United States of America (In descending order of the expected increase).
- The UN report shows migration to countries with a falling ratio of working-age people to those above 65 will be steady, as those economies open up to workers to sustain economic production.
- Japan has the lowest such ratio, followed by Europe and the Caribbean; in over three decades, North America, Eastern and Southeastern Asia will join this group.
- India meanwhile will have a vast number of young people and insufficient natural resources left for exploitation. Preparing for the changes and opportunities migration offers will depend on a skills revolution.

Source: ForumIAS factly

**Q.6)** Consider the following statements regarding the National Safai Karamcharis Finance & Development Corporation (NSKFDC):

1. It is a government undertaking owned by both Central and state governments.
2. It is an apex corporation for the all round socio-economic upliftment of the Safai Karamcharis, Scavengers and their dependants throughout India.
3. It is the nodal agency for implementation of the Central Sector Self Employment Scheme for Rehabilitation of Manual Scavengers (SRMS).

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** National Safai Karamcharis Finance & Development Corporation(NSKFDC), A wholly owned Govt. of India Undertaking under the Ministry of Social Justice & Empowerment (M/o SJ&E) was set up on 24th January 1997 as a Company “Not for Profit” under Section 25 of the Companies Act, 1956.

- NSKFDC is in operation since October, 1997, as an Apex Corporation for the all round socio-economic upliftment of the Safai Karamcharis, Scavengers and their dependants throughout India, through various loan and non-loan based schemes.
- Apart from operating various loan and non-loan based schemes for the upliftment of the target group, NSKFDC is playing a vital role in elimination of manual scavenging - the worst surviving symbol of untouchability.
- NSKFDC has been designated as the Nodal Agency for implementation of the Central Sector Self Employment Scheme for Rehabilitation of Manual Scavengers (SRMS) under the aegis of the Ministry of Social Justice & Empowerment.

Source: ForumIAS factly

**Q.7)** Consider the following statements regarding the Dr. Ambedkar scheme for Social integration through Inter Caste Marriages:

1. It is applicable to 1000 couples annually.
2. Each couple gets 5 lakh rupees.
3. To avail the scheme, one of the couple should belong to either schedule caste or schedule tribes.

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) None

**ANS: D**

**Explanation:** Under the Dr. Ambedkar scheme for Social integration through Inter Caste Marriages scheme, 500 couples can apply annually. Each couple gets Rs 2.5 lakh, of which Rs 1.5 lakh is paid up-front. The balance amount is kept as a fixed deposit and released to the couple after three years

- The number of couples who can avail the scheme in a state depends on its Scheduled Caste population as per the 2011 census.
- Among the beneficiary couple, one of the spouses should belong to Scheduled Caste and the other to a Non-Scheduled Caste.
- It shall be the discretion of the Minister of Social Justice & Empowerment & Chairman of Dr. Ambedkar Foundation to sanction the incentive to the Couple.

Source: The Hindu

**Q.8)** The Sanitation is related to which of the following List of Schedule 7 of Indian Constitution?

- a) Union list
- b) State List
- c) Concurrent list
- d) None

**ANS: B**

**Explanation:** The State List lists subjects under which the legislature of a state may make laws. Public order, police, public health and sanitation; hospitals and dispensaries, betting and gambling are some of the subjects that come under the state.

Source: Laxmikanth

**Q.9)** The *Time to Care* report, sometimes in news is related to which of the following?

- a) Wealth Inequality
- b) Climate change
- c) Financial exclusion
- d) Refugees

**ANS: A**

**Explanation:** India's richest 1% hold more than four-times the wealth held by 953 million people who make up for the bottom 70% of the country's population, while the total wealth of all Indian billionaires is more than the full-year budget.

- Releasing the study *Time to Care*, ahead of the 50th Annual Meeting of the World Economic Forum (WEF), rights group Oxfam also said the world's 2,153 billionaires have more wealth than the 4.6 billion people who make up 60 per cent of the planet's population.
- The report flagged that global inequality is shockingly entrenched and vast and the number of billionaires has doubled in the last decade, despite their combined wealth having declined in the last year.

Source: The Hindu

**Q.10)** The "Bru/Reang community", sometimes seen in news is related to which of the following state?

- a) Manipur
- b) Jharkhand
- c) Chhattisgarh
- d) Mizoram

**ANS: D**

**Explanation:** Twenty-three years after ethnic clashes in Mizoram forced 37,000 people of the Bru (or Reang) community to flee their homes to neighbouring Tripura, an agreement has been signed to allow them to remain permanently in the latter state.

- The agreement among the Bru leaders and the governments of India, Tripura, and Mizoram, signed in New Delhi on January 16, gives the Bru the choice of living in either state.
- In several ways, the agreement has redefined the way in which internal displacement is treated in India.

Source: Indian Express

## *Society & Development*

**Q.1)** The Government of India launched “Shilpgram and Octave” is related to which of the following?

- a) Environmental Conservation
- b) Defense Radars
- c) Artificial Intelligence
- d) Cultural Promotion

**ANS: D**

**Explanation:** To preserve & promote various forms of folk art and culture of the tribals throughout the country including West Bengal, the Government of India has set up seven Zonal Cultural Centres (ZCCs) with headquarters at Patiala, Nagpur, Udaipur, Prayagraj, Kolkata, Dimapur and Thanjavur.

These ZCCs organize various cultural activities and programmes all over the country on regular basis. These ZCCs under Ministry of Culture are also implementing a number of schemes for promoting the folk/tribal art and culture, details of which are as below:

- **Theatre Rejuvenation:** To promote theatre activities including stage shows and Production oriented workshops, etc. Honorarium Up to Rs. 30,000/- per show excluding TA & DA is paid. The groups finalized on the basis their credentials as well as the merit of project submitted by them.
- **Research & Documentation:** To preserve promote and propagate vanishing visual and performing art forms including folk, tribal and classical in the field of music, dance, theatre, literature, fine arts etc. in print/ audio – visual media. The art form is finalized in consultation with state Cultural Department.
- **Shilpgram:** To promote folk and tribal art and crafts of the zone by organizing seminar, workshops, exhibitions, craft fairs, design development and marketing support to the artisans living in the rural areas.
- **Octave:** To promote and propagate the rich cultural heritage of North East region comprising of eight States namely Arunachal Pradesh, Assam, Meghalaya, Mizoram, Sikkim, Nagaland, Manipur and Tripura to the rest of India.

Source: ForumIAS factly

**Q.2)** Consider the following statements with respect to Deen Dayal Upadhyaya Grameen Kaushalaya Yojana (DDU-GKY):

1. It is launched by Ministry of Skill Development in 2014
2. Its aim is to transform rural poor youth into an economically independent and globally relevant workforce

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The Government has informed that around 4.39 lakh candidates have been trained during 2018-19 and 2019-20 under Deen Dayal Upadhyaya Grameen Kaushalaya Yojana (DDU-GKY).

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It was launched in 2014 by the Ministry of Rural Development (MoRD) as a part of the National Rural Livelihood Mission (NRLM). Scheme aim is to transform rural poor youth into an economically independent and globally relevant workforce.

Source: ForumIAS factly

**Q.3)** Consider the following statements with respect to Pradhan Mantri Laghu Vyapari Maan-dhan Yojana:

1. It is a compulsory and contributory pension scheme
2. Ministry of finance is the nodal ministry to implement the scheme

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** National Pension Scheme for Traders, Shopkeepers and Self-Employed Persons (originally proposed name was, Pradhan Mantri Laghu Vyapari Maan-dhan Scheme) has been launched on 12.09.2019. It is a voluntary and contributory pension scheme.

- The traders in the age group of 18-40 years with an annual turnover, not exceeding Rs.1.5 crore and who is not a member of EPFO/ESIC/NPS/PM-SYM or an income tax payer, can join the scheme.
- Under the scheme, 50% monthly contribution is payable by the beneficiary and equal matching contribution is paid by the Central Government. Subscribers, after attaining the age of 60 years, are eligible for a monthly minimum assured pension of Rs.3,000/-.
- As the Scheme has been launched on 12th September, 2019. It envisages a coverage of about 50 lakh enrolments under the Scheme for 2019-20.
- In order to achieve this, various measures including celebration of Pension Week/ Pension Saptah have been taken.
- All State/UT Governments were requested for popularizing and bringing more awareness about the Scheme.
- The progress of the Scheme is being reviewed regularly in the Ministry at senior level with State/UT Governments, for taking initiatives under Mission Mode. Ministry of Labour & Employment is the nodal ministry to implement the scheme.

Source: ForumIAS factly

**Q.4)** Consider the following statements with respect to Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP):

1. PMBJP campaign launched by Ministry of Health to provide quality medicines at affordable prices to the masses
2. Bureau of Pharma PSUs of India (BPPI) is the implementation agency for PMBJP

Which of the following above statements is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) is a campaign launched by the Department of Pharmaceuticals to provide quality medicines at affordable prices to the masses.

- PMBJP stores have been set up to provide generic drugs, which are available at lesser prices but are equivalent in quality and efficacy as expensive branded drugs.
- It was launched by the Department of Pharmaceuticals in November 2008 under the name Jan Aushadi Campaign.
- Bureau of Pharma PSUs of India (BPPI) is the implementation agency for PMBJP

Source: ForumIAS factly

**Q.5)** Consider the following statements with respect to National Career service (NCS) Scheme:

1. National Career Service (NCS) is a one-stop solution that provides a wide array of employment and career related services to the citizens of India
2. The scheme is being implemented by the Directorate General of Employment, Ministry of Labour & Employment

Which of the following above statements is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** National Career Service is a Five Year Mission Mode Project launched by the Hon'ble Prime Minister on 20th July, 2015. The project is being implemented by the Directorate General of Employment, Ministry of Labour & Employment.

- National Career Service (NCS) is a one-stop solution that provides a wide array of employment and career related services to the citizens of India.
- It works towards bridging the gap between jobseekers and employers, candidates seeking training and career guidance, agencies providing training and career counselling.
- The NCS project reaches out to the people of this country through its three essential pillars i.e. a well designed ICT based portal which is NCS portal, Country wide set up of Model Career Centers and Inter-linkage with all the states through employment exchanges.
- The digital centralized portal provides a wide range of career related services including job search, job matching, rich career content, career counselling, information on Job Fairs, services of local service providers like drivers, plumbers, etc. for households and various other services. This portal facilitates registration of Job Seekers, Employers, Skill Providers, Career Counsellors, Local Service Providers (LSP's), Career Centers, Placement Organisations, Households (for availing the services of the LSP's) and Government Departments.

Source: The Hindu

**Q.6)** Consider the following statements with respect to the Prime Minister's National Relief Fund (PMNRF):

1. It was established by Indira Gandhi in 1971
2. The fund is recognized as a Trust under the Societies Registration Act of 1860

Which of the following codes below given is/are NOT correct?

- a) 1 only



- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** In pursuance of an appeal by the then Prime Minister, Pt. Jawaharlal Nehru in January, 1948, the Prime Minister's National Relief Fund (PMNRF) was established with public contributions to assist displaced persons from Pakistan.

- The resources of the PMNRF are now utilized primarily to render immediate relief to families of those killed in natural calamities like floods, cyclones and earthquakes, etc. and to the victims of the major accidents and riots.
- Assistance from PMNRF is also rendered, to partially defray the expenses for medical treatment like heart surgeries, kidney transplantation, cancer treatment and acid attack etc.
- The fund consists entirely of public contributions and does not get any budgetary support. The corpus of the fund is invested in various forms with scheduled commercial banks and other agencies.
- Disbursements are made with the approval of the Prime Minister. PMNRF has not been constituted by the Parliament.
- The fund is recognized as a Trust under the Income Tax Act and the same is managed by Prime Minister or multiple delegates for national causes.

Source: ForumIAS factly

**Q.7)** Article 350B of Indian Constitution has provision relating to which of the following?

- a) Language to be used in representations for redress of grievances.
- b) Special officer for linguistic minorities.
- c) Directive for development of the hindi language.
- d) Facilities for instruction in mother-tongue at primary stage.

**ANS: B**

**Explanation:** Originally, the Constitution of India did not make any provision with respect to the Special Officer for Linguistic Minorities.

- Later, the States Reorganisation Commission (1953-55) made a recommendation in this regard.
- Accordingly, the Seventh Constitutional Amendment Act of 1956 inserted a new Article 350-B in Part XVII of the Constitution.

Source: Laxmikanth

**Q.8)** Which of the following acts relevant provisions are subsumed by Code on Wages Bill, 2019?

1. The Minimum Wages Act, 1948.
2. The Payment of Wages Act, 1936.
3. The Payment of Bonus Act, 1965.
4. The Equal Remuneration Act, 1976.

Select the correct answer using the code given below:

- a) 1, 2, 3 and 4
- b) 1, 2 and 3 only
- c) 2, 3 and 4 only
- d) 1, 2 and 4 only

**ANS: A**

**Explanation:** Lok Sabha passed the Code on Wages Bill, 2019, which amends and consolidates laws relating to wages/bonus and universalizes the provisions of minimum wages and timely payment of wages to all employees irrespective of the sector and wage ceiling.

- At present, the provisions of both Minimum Wages Act and Payment of Wages Act apply to workers below a particular wage ceiling working in Scheduled Employments only.
- “This Bill would ensure Right to Sustenance for every worker and intends to increase the legislative protection of minimum wage from existing about 40% to 100% workforce.”
- A release issued by the Ministry noted that the Code on Wages Bill, 2019, subsumes relevant provisions of the Minimum Wages Act, 1948, the Payment of Wages Act, 1936, the Payment of Bonus Act, 1965 and the Equal Remuneration Act, 1976.
- After the enactment of the Bill, all these four Acts will get repealed.

Source: The Hindu

**Q.9)** Consider the following statements regarding the “Motor Vehicles (Amendment) Bill, 2019”:

1. It defines golden hour as the time period of up to two hours.
2. It requires the central government to constitute a Motor Vehicle Accident Fund, to provide compulsory insurance cover to all road users in India.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The Motor Vehicles (Amendment) Bill, 2019 was introduced in Lok Sabha on July 15, 2019. The Bill seeks to amend the Motor Vehicles Act, 1988 to provide for road safety.

The Act provides for grant of licenses and permits related to motor vehicles, standards for motor vehicles, and penalties for violation of these provisions.

Compensation for road victims: The central government will develop a scheme for cashless treatment of road accident victims during golden hour.

- The Bill defines golden hour as the time period of up to one hour following a traumatic injury, during which the likelihood of preventing death through prompt medical care is the highest.
- The central government may also make a scheme for providing interim relief to claimants seeking compensation under third party insurance.
- The Bill increases the minimum compensation for hit and run cases as follows: (i) in case of death, from Rs 25,000 to two lakh rupees, and (ii) in case of grievous injury, from Rs 12,500 to Rs 50,000.

Compulsory Insurance: The Bill requires the central government to constitute a Motor Vehicle Accident Fund, to provide compulsory insurance cover to all road users in India.

Good Samaritans: The Bill defines a good samaritan as a person who renders emergency medical or non-medical assistance to a victim at the scene of an accident.

- The assistance must have been (i) in good faith, (ii) voluntary, and (iii) without the expectation of any reward.

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- Such a person will not be liable for any civil or criminal action for any injury to or death of an accident victim, caused due to their negligence in providing assistance to the victim.

Recall of Vehicles: The Bill allows the central government to order for recall of motor vehicles if a defect in the vehicle may cause damage to the environment, or the driver, or other road users.

Taxi aggregators: The Bill defines aggregators as digital intermediaries or market places which can be used by passengers to connect with a driver for transportation purposes (taxi services). These aggregators will be issued licenses by state further they must comply with the Information Technology Act, 2000.

Source: PRSINDIA

**Q.10)** Which of the following provisions of the constitution is/are related to “secular state of India”?

1. The term secular was added to the Preamble of the Indian Constitution by the 44th Constitutional Amendment Act of 1978.
2. The Preamble secures to all citizens of India liberty of belief, faith and worship
3. The State shall not deny to any person equality before the law or equal protection of the laws

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** The Constitution of India stands for a secular state. Hence, it does not uphold any particular religion as the official religion of the Indian State. The following provisions of the Constitution reveal the secular character of the Indian State:

- The term ‘secular’ was added to the Preamble of the Indian Constitution by the 42nd Constitutional Amendment Act of 1976.
- The Preamble secures to all citizens of India liberty of belief, faith and worship.
- The State shall not deny to any person equality before the law or equal protection of the laws (Article 14).
- The State shall not discriminate against any citizen on the ground of religion (Article 15).
- Equality of opportunity for all citizens in matters of public employment (Article 16).
- All persons are equally entitled to freedom of conscience and the right to freely profess, practice and propagate any religion (Article 25).
- Every religious denomination or any of its section shall have the right to manage its religious affairs (Article 26).
- No person shall be compelled to pay any taxes for the promotion of a particular religion (Article 27).

Source: Laxmikanth

## *Society & Welfare - II*

**Q.1)** “Lorenz curve” is associated with which of the following?

- a) Unemployment
- b) Inflation
- c) Inequality
- d) Climate Change

**ANS: C**

**Explanation:** A graph showing the degree of inequality in income and wealth in a given population or an economy.

- It is a rigorous way to measure income inequality. In this method (for example), personal incomes in an economy are arranged in increasing order; the cumulative share of total income is then plotted against the cumulative share of the population.
- The curve's slope is thus proportional to per capita income at each point of the population distribution.
- In the case of complete equality of income, the Lorenz curve will be a straight line and with greater curvature the inequality rises proportionally—the Gini Coefficient measures this inequality.

Source: TMH Ramesh Singh

**Q.2)** “Grihini Suvidha Yojana” is launched by which of the following state?

- a) Andhra Pradesh
- b) Tamil Nadu
- c) Sikkim
- d) Himachal Pradesh

**ANS: D**

**Explanation:** Himachal Grihini Suvidha Yojana launched in 2018, it aimed to cover households left out under Pradhan Mantri Ujjwala Yojana.

Except families having a pensioner, income taxpayer or any member employed with the government, board, corporation etc, all households of the state without an LPG connection were eligible.

Source: The Hindu

**Q.3)** “e – Sampada” is recently in news is launched by which of the following?

- a) Ministry of Food Processing Industries
- b) Ministry of Animal Husbandry and Fisheries
- c) NITI Aayog
- d) Ministry of Housing and Urban Affairs

**ANS: D**

**Explanation:** The Ministry of Urban Affairs launched a new Web Portal and Mobile App, e-Sampada which provides a single window for all these services including allotment for over one lakh government residential accommodations, office space allotment to government organisations in 28 cities and venues like 5, Ashoka Road for social functions.

In its endeavour to provide ‘One Nation, One System’, the erstwhile four websites (gpra.nic.in, eawas.nic.in, estates.gov.in, holidayhomes.nic.in), and two Mobile Apps (m-

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Awasthi & Ashoka) of the Directorate of Estates have been integrated into one, which paves the way for all services on the same platform throughout the country.

Source: The New Indian Express.

**Q.4)** Recently, Khadi and Village Industries Commission (KVIC) revived the 1000 year old Monpa Handmade Paper of which of the following state?

- a) Gujarat
- b) Tripura
- c) Arunachal Pradesh
- d) Odisha

**ANS: C**

**Explanation:** Due to the committed efforts of Khadi and Village Industries Commission (KVIC), the 1000-year old heritage art – the Monpa Handmade Paper of Arunachal Pradesh – which was driven to the extinction, has come to life once again.

- The art of making Monpa handmade paper originated over 1000 years ago. Gradually the art became an integral part of local custom and culture in Tawang in Arunachal Pradesh.
- Once produced in every household in Tawang, this handmade paper was a major source of livelihood for the locals. However, the handmade paper industry almost disappeared in the last 100 years; prompting KVIC to plan revival of this ancient art.

Source: Press Information Bureau

**Q.5)** With reference to the “Municipal bonds”, which of the following statements is/are correct?

1. It is a kind of debt instrument where investors offer loans to local governments.
2. Surat was the first city in south Asia to launch a municipal bond.

Select the correct answer using the code given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** A municipal bond is a kind of debt instrument where investors offer loans to local governments.

They are issued by civic bodies for specific projects and usually have a 10-year tenure. The ULB pays the annual interest on the bonds to the investor at the decided rate.

- Ahmedabad was the first city in south Asia to launch a municipal bond of Rs 100 crore in 1998, which was completely subscribed.
- Surat Municipal Corporation was the second city in Gujarat to announce bonds in 2018, to fund a sewage treatment project worth Rs 450 crore.
- The Vadodara Municipal Corporation (VMC) is expected to launch municipal bonds in January, and will become the third Urban Local Body (ULB) in Gujarat to use this method to raise money to fund development work sanctioned under the Atal Mission for Rejuvenation and Urban Transformation (AMRUT).

Source: Indian Express

**Q.6)** With reference to the “Adopt a Heritage: Apni Dharohar, Apni Pehchaan project”, which of the following is/are eligible to adopt a heritage?

1. Individuals

2. Non Governmental Organizations

3. Public sector companies

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** The Ministry of Tourism, Government of India runs the “Adopt a Heritage: Apni Dhरोhar, Apni Pehchaan” project which is a collaborative effort by the Ministry of Tourism, Ministry of Culture, Archaeological Survey of India and State/ UTs Government for developing tourism amenities at heritage/ natural/ tourist sites spread across India for making them tourist friendly, in a planned and phased manner which I started in September 2017.

The project aims to encourage companies from public sector, private sector, trusts, NGOs, individuals and other stakeholders to become ‘Monument Mitras’ and take up the responsibility of developing and upgrading the basic and advanced tourist amenities at these sites as per their interest and viability in terms of a sustainable investment model under CSR. They would also look after the Operation & Maintenance of the same.

Source: Indian Express

**Q.7)** With reference to the “Sentinelese”, which of the following statements is/are correct?

- 1. The population of Sentinelese is shown increasing trend in last decade.
- 2. Sentineles are Negrito tribes who inhabited the North Sentinel Island of Andaman.

Select the correct answer using the code given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The Population growth of Sentinelese does not show any improvement in the last Decade.

- The Sentinelese, with a population of about 50 to 100 on the North Sentinel Island, are not only among the most isolated of nearly 70 PVTGs across the country.
- The Andaman Islands are home to four ‘Negrito’ tribes namely the Great Andamanese, Onge, Jarawa and Sentinelese.
- Nicobar Islands are home to two ‘Mongoloid’ tribes – the Shompen and Nicobarese.

Source: The Hindu

**Q.8)** “Global Pravasi Rishta Portal” is recently seen in news is launched by?

- a) NITI Aayog
- b) Ministry of External Affairs
- c) Ministry of Home Affairs
- d) Ministry of Culture

**ANS: B**

**Explanation:** Ministry of External Affairs has launched the Global Pravasi Rishta Portal and app in order to connect with nearly 3.12 crore Indians across the world.

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It acts as a dynamic communication platform by facilitating a three-way communication between the Indian Missions (meaning the embassies), external affairs ministry and Indian diaspora.

Source: Indian Express

**Q.9)** “Human Freedom Index 2020” is released by which of the following?

- a) World Economic Forum
- b) Transparency International
- c) United Nations
- d) Fraser Institute

**ANS: D**

**Explanation:** The Human Freedom Index 2020 has been jointly released by Fraser Institute in Canada and the Cato Institute in the United States.

- The index presents a broad measure of human freedom, understood as the absence of coercive constraints.
- It uses a 0 to 10 scale to measure personal freedom based on parameters such as rule of law, safety and security, identity and relationships, freedom of movement, economic freedom, and ability of individuals to make their own economic decisions without government or crony interference.
- New Zealand has topped the index followed by Switzerland and Hong Kong. India has been placed at the 111th spot out of 162 countries.

Source: The Hindu

**Q.10)** Recently, India and which of the following country jointly launched “Virtual Vaccines Hub”?

- a) France
- b) Germany
- c) United Kingdom
- d) United States of America

**ANS: C**

**Explanation:** India and the UK Government have launched a Virtual Vaccines Hub. It aims to distribute vaccines for Covid-19 and other deadly viruses by sharing knowledge on clinical trials and regulatory approvals and get vaccines to people who need them most in a safe, secure and energy-efficient way.

Source: Times of India

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## *Disaster Management*

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**Q.1)** Disaster Management act was enacted in which of the following year?

- a) 2000
- b) 2005
- c) 2007
- d) 2014

**ANS: B**

**Explanation:** The Disaster Management Act, 2005 has been enacted by the Parliament of India for the effective management of disasters.

Source: Shankar IAS

**Q.2)** Consider the following statements regarding National Disaster Management Authority (NDMA):

1. It is the apex constitutional body for disaster management in India.
2. Home minister is the chairperson of NDMA.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** The National Disaster Management Authority (NDMA) is the apex statutory body for disaster management in India.

The NDMA was formally constituted on 27th September 2006, in accordance with the Disaster Management Act, 2005 with Prime Minister as its Chairperson and nine other members, and one such member to be designated as Vice-Chairperson.

Source: ForumIAS factly

**Q.3)** Consider the following statements regarding National Disaster Responsive Force (NDRF):

1. It functions under ministry of Home Affairs.
2. It consists of both military and Para-military battalion forces.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** Today NDRF is a distinguished, unique Force across the country functioning under the Ministry of Home Affairs, Government of India, within the overall command, control and leadership of the Director General, NDRF.

- At present, National Disaster Response Force consists of 12 battalions, three each from the BSF and CRPF and two each from CISF, ITBP and SSB.



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- Each battalion have 18 self-contained specialist search and rescue teams of 45 personnel each including engineers, technicians, electricians, dog squads and medical/paramedics.
- The total strength of each battalion is 1,149. All the 12 battalions have been equipped and trained to respond natural as well as man-made disasters.
- Battalions are also trained and equipped for response during chemical, biological, radiological and nuclear (CBRN) emergencies.

Source: <http://www.ndrf.gov.in/about-us>

**Q.4)** Consider the following statements regarding District Disaster Management Authority (DDMA):

1. Disaster management act provides for constitution of DDMA for every district of a state.
  2. It is headed by local elected representative.
  3. It is responsible for planning, coordination and implementation of disaster management.
- Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1 and 3 only

**ANS: D**

**Explanation:** Section 25 of the DM Act provides for constitution of DDMA for every district of a state.

- The District Magistrate/ District Collector/Deputy Commissioner heads the Authority as Chairperson besides an elected representative of the local authority as Co-Chairperson except in the tribal areas where the Chief Executive Member of the District Council of Autonomous District is designated as Co-Chairperson.
- Further in district, where Zila Parishad exists, its Chairperson shall be the Co-Chairperson of DDMA.
- The District Authority is responsible for planning, coordination and implementation of disaster management and to take such measures for disaster management as provided in the guidelines.
- The District Authority also has the power to examine the construction in any area in the district to enforce the safety standards and to arrange for relief measures and respond to the disaster at the district level.

Source: Ministry of Home Affairs

**Q.5)** The “Ring of Fire” is often seen in news is located around which of the following Ocean?

- a) Pacific Ocean
- b) Arctic Ocean
- c) Antarctic Ocean
- d) Atlantic Ocean

**ANS: A**

**Explanation:** Since 1970, more than two million people have been killed by natural disasters in the ‘Ring of Fire’ region around the Pacific Ocean, an average of 43,000 a year, as per the United Nations (UN).

Source: The Hindu

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**Q.6)** Consider the following statements regarding National Hydrology Project:

1. It was started in 2016 as a Central Sector Scheme.
2. It is an initiative of the Ministry of Jal Shakti and is supported by the World Bank.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** National Hydrology Project was started in 2016 as a Central Sector Scheme with 100% grant to implementing agencies on pan India basis.

- It is an initiative of the Ministry of Jal Shakti and is supported by the World Bank.
- It has a budget outlay of Rs. 3680 crore to be spent over a period of 8 years.

Aim:

- To improve the extent, reliability and accessibility of water resources information.
- To strengthen the capacity of targeted water resource management institutions in India.
- To facilitate acquisition of reliable information efficiently this would pave the way for an effective water resource development and management.

Project Beneficiaries:

- Central and state implementing agencies responsible for surface and/or groundwater planning and management, including river basin organizations.
- Users of the Water Resources Information System (WRIS) across various sectors and around the World.

Source: <http://nhp.mowr.gov.in/HomeNew/NHPIIndexnew.aspx>

**Q.7)** Consider the following statements regarding Sendai Framework Agreement:

1. It was endorsed by the UN General Assembly following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR).
2. The timeline for agreement is 2015 to 2030.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) was the first major agreement of the post-2015 development agenda and provides Member States with concrete actions to protect development gains from the risk of disaster.

- The Sendai Framework works hand in hand with the other 2030 Agenda agreements, including The Paris Agreement on Climate Change, The Addis Ababa Action Agenda on Financing for Development, the New Urban Agenda, and ultimately the Sustainable Development Goals.
- It was endorsed by the UN General Assembly following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR).

Source: <https://www.undrr.org/implementing-sendai-framework/what-sendai-framework>

**Q.8)** Consider the following statements regarding Disaster Management in India:

1. Constitution of India does not explicitly mention the word Disaster.
2. Central government used the concurrent subject to pass disaster management act.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Constitution of India does not have any explicit provision on the subject of disaster management. ... As a result, the subject of disaster management failed to secure a place in the elaborate scheme of division of vital subjects between the centre and states.

- As far as the DM Act is concerned, the Seventh Schedule to the Constitution does not have an explicit entry on disaster management.
- Hence, Parliament had to trace its legislative competence for passing the DM Act to the Concurrent List entry on “Social security and social insurance; employment and unemployment”.

Source: <https://vidhilegalpolicy.in/blog/covid-19-and-the-need-for-clear-centre-state-roles/>

**Q.9)** Which of the following factors are affecting the ocean salinity?

1. Evaporation
2. Freezing of Ice
3. Rivers
4. Wind flow

Select the correct answer using the code given below:

- a) 1, 2 and 3 only
- b) 2, 3 and 4 only
- c) 1, 3 and 4 only
- d) 1, 2, 3 and 4

**ANS: D**

**Explanation:** All waters in nature, whether rain water or ocean water, contain dissolved mineral salts. Salinity is the term used to define the total content of dissolved salts in sea water. Factors affecting ocean salinity are mentioned below:

- The salinity of water in the surface layer of oceans depends mainly on evaporation and precipitation.
- Surface salinity is greatly influenced in coastal regions by the fresh water flow from rivers, and in Polar Regions by the processes of freezing and thawing of ice.
- Wind, also influences salinity of an area by transferring water to other areas.
- The ocean currents contribute to the salinity variations. Salinity, temperature and density of water are interrelated. Hence, any change in the temperature or density influences the salinity of water in an area.

Source: NCERT

**Q.10)** Consider the following statements regarding the Storm Surge:

1. Storm surge is the abnormal rise in seawater level during a storm, measured as the height of the water above the normal predicted astronomical tide.
2. The amplitude of the storm surge at any given location depends on the orientation of the coast line with the storm track, the intensity, size, speed of the storm, and the local bathymetry.

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Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** Storm Surge.

- Storm surge is the abnormal rise in seawater level during a storm, measured as the height of the water above the normal predicted astronomical tide.
- The surge is caused primarily by a storm's winds pushing water onshore.
- The amplitude of the storm surge at any given location depends on the orientation of the coast line with the storm track;
- The intensity, size, and speed of the storm; and the local bathymetry.

Source: NOAA

## *Science & Technology*

**Q.1)** The Government of India launched a prestigious programme “National Optical Fibre Network (NOFN)” to provide broadband services to rural areas. On which principle the optical fibre works?

- a) Polarisation
- b) Total internal reflection
- c) Total internal refraction
- d) None

**ANS: B**

**Explanation:** Optical fibre is a device which works on the principle of total internal reflection by which light signals can be transmitted from one place to another with negligible loss of energy.

Source: The Hindu

**Q.2)** Recently which state police has adopted a unique bar-coding software - Trakea - to ensure that thousands of forensic reports that form the backbone of the criminal investigation system?

- a) Andhra Pradesh
- b) Uttar Pradesh
- c) Maharashtra
- d) Haryana

**ANS: D**

**Explanation:** Haryana Police has adopted a unique barcoding software — Trakea — to ensure that thousands of forensic reports that form the backbone of the criminal investigation system and subsequent trials in the courts of law, are not tampered with.

- According to the police, Trakea ensures foolproof security of the samples collected from the scene of crime, and the forensic analysis reports, and is different from traditional methods that the state police force has been following for decades.
- Haryana Police claims it is the country’s first police force to have introduced this unique barcoding for forensic reports.

Source: The Hindu

**Q.3)** Consider the following statements regarding e-waste clinic in India:

1. India’s first e-waste clinic has been inaugurated in Indore, Madhya Pradesh.
2. It would enable segregation, processing and disposal of waste from both household and commercial units.
3. The clinic is set up in accordance with the Solid Waste Management Rules adopted in 2016.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) 1 and 3 only
- d) 2 and 3 only

**ANS: D**

**Explanation:** India's first e-waste clinic has been inaugurated in Bhopal and will enable segregation, processing and disposal of electronic waste from both household and commercial units.

- It was set up by the Bhopal Municipal Corporation and the Central Pollution Control Board.
- The e-waste clinic is developed on the bases of a three-month pilot project and, if successful, more clinics will be built throughout the country.
- The clinic is set up in accordance with the Solid Waste Management Rules adopted in 2016.

Source: ForumIAS factly

**Q.4)** Recently a Bilateral Patent Prosecution Highway (PPH) pilot program has commenced between the Indian Patent Office (IPO) and which of the following?

- a) Switzerland Patent Office
- b) Japan Patent Office
- c) The United States Patent and Trademark Office
- d) The National Industrial Property Institute (France)

**ANS: B**

**Explanation:** A Bilateral Patent Prosecution Highway (PPH) pilot program has commenced between the Indian Patent Office (IPO) and the Japan Patent Office (JPO).

The Patent Prosecution Highway (PPH) is a set of initiatives for providing accelerated patent prosecution procedures by sharing information between some patent offices.

Source: The Hindu

**Q.5)** According to the Directorate General Foreign Trade (DGFT), Beach Sand Minerals (BSM) comprised a suite of seven minerals. Which of the following minerals are consists of BSM?

1. Limonite
2. Rutile
3. Zircon
4. Strontium
5. Monazite

Select the correct answer using the codes given below:

- a) 1, 2 and 4 only
- b) 1, 2 and 3 only
- c) 1, 2, 3 and 5 only
- d) 1, 2, 3, 4 and 5

**ANS: C**

**Explanation:** According to the Directorate General Foreign Trade (DGFT) Beach Sand Minerals (BSM) comprised a suite of seven minerals.

- They are limonite, rutile, leucoxene (titanium being mineral), zircon (zirconium being mineral), garnet, sillimanite and monazite (a proscribed substance under the Atomic Energy Act of 1962 since it covers uranium and thorium).
- The suites of BSM were also called atomic minerals. Except garnet and sillimanite, others were prescribed substances under the Atomic Energy Act.

Source: The Hindu

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**Q.6)** The SCOJtEx-2019 is a four-day long exercise, sometimes seen in news is related to which of the following?

- a) Army exercise
- b) High Altitude military exercise
- c) Naval exercise
- d) Urban Earthquake Search and Rescue exercise

**ANS: D**

**Explanation:** India had always been the first respondent in situations of Humanitarian Assistance and Disaster Management (HADR) in the subcontinent said by Indian Home Minister.

- Addressing the 10th meeting of the Heads of Departments of SCO member-States, he called on the Shanghai Cooperation organisation (SCO) members to make a concerted, synchronised effort towards securing people from disasters.
- Minister expressed the confidence that the four-day Joint Exercise on Urban Earthquake Search and Rescue (SCOJtEx)-2019, held in November 2019, and the ministerial meeting would help in finalizing an action plan for managing disasters for the year 2020-21.

Source: The Hindu

**Q.7)** Consider the following statements regarding the microdot technology:

1. It involves spraying of thousands of nano dots carrying registration information on vehicles.
2. The microdots are adhesive and they become permanent fixtures which cannot be removed without damaging the asset.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The microbot technology involves spraying of thousands of nano dots carrying registration information on vehicles.

- These nano-size metal particles carry information like the registration number and chassis number of the vehicle.
- The dots are sprayed at many different spots on the vehicle, so that even if the vehicle is stolen and sold for parts, it can be traced.
- The microdots are adhesive and will become permanent fixtures/affixation which cannot be removed without damaging the asset, which is the vehicle itself.

Source: Indian Express

**Q.8)** The Elastocaloric effect is recently seen in news is related to which of the following?

- a) Cooling
- b) Aero-dynamics
- c) Nuclear power
- d) Wind energy

**ANS: A**

**Explanation:** When rubbers bands are twisted and untwisted, it produces a cooling effect. This is called the “elastocaloric” effect, and researchers have suggested that it can be used in a very relevant context today.

- Researchers from multiple universities, including Nankai University in China, have found that the elastocaloric effect, if harnessed, may be able to do away with the need of fluid refrigerants used in fridges and air-conditioners.
- These fluids are susceptible to leakages, and can contribute to global warming. In the elastocaloric effect, the transfer of heat works much the same way as when fluid refrigerants are compressed and expanded.
- When a rubber band is stretched, it absorbs heat from its environment, and when it is released, it gradually cools down.
- In order to figure out how the twisting mechanism might be able to enable a fridge, the researchers compared the cooling power of rubber fibres, nylon and polyethylene fishing lines and nickel-titanium wires.
- They observed high cooling from twist changes in twisted, coiled and super-coiled fibres.

Source: The Hindu

**Q.9)** “Truenat” is often seen in news is related to which of the following?

- a) CoVID – 19 testing kit
- b) Tuberculosis (TB) testing kit
- c) Malaria testing kit
- d) Japan encephalitis testing kit

**ANS: B**

**Explanation:** In a Rapid Communication published on January 14 – 2020, the World Health Organization (WHO) had mentioned that the India-made Truenat MTB, a molecular diagnostic test to diagnose pulmonary and extrapulmonary TB and rifampicin-resistant TB, has high diagnostic accuracy.

- Truenat MTB has “high diagnostic accuracy as initial test to diagnose TB and to sequentially detect rifampicin resistance”, says the WHO Communication.
- Truenat MTB will be used as an initial test to diagnose TB thus replacing sputum smear microscopy.
- Truenat is developed by the Goa-based Molbio Diagnostics.
- The company was provided with technical assistance and resources by the Foundation for Innovative New Diagnostics (FIND) to help commercialize Truenat. Indian Council of Medical Research (ICMR) had assessed and validated the diagnostic tool.

Source: ForumIAS factly

**Q.10)** The term “Juice Jacking” often seen in news is related to which of the following?

- a) Cyber attacks
- b) Fibre extracting method
- c) Automobile lubricant
- d) Crude oil extraction

**ANS: A**

**Explanation:** Mobile phones can get infected through a type of cyber attack called Juice Jacking. A USB port is not simply a power socket, you can also use it to transfer and sync your data.



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- A hacker can tamper with a USB charging port at a public charging station to steal passwords and export data.
- The main way to avoid juice jacking is to stay away from public charging stations or portable wall chargers.
- Carry a personal charger or a power bank or use USB condoms which are adaptors that allow the power transfer but don't connect the data transfer pins.
- Switch off your phone or lock your phone and then plug it into the charging port. But this technique only works on few mobile models

Source: The Hindu

ForumIAS

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## *Various Security Forces & Their Mandate & Miscellaneous*

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**Q.1)** Which of the following is the oldest Para-military organization in India?

- a) Assam Rifles
- b) Central Reserve Police Force
- c) Central Industrial Security Force
- d) Sashastra Seema Bal

**ANS: A**

**Explanation:** The Assam Rifles is India's oldest paramilitary force which has been at the forefront of keeping India safe for nearly 19 decades.

Source: <https://www.aninews.in/news/national/general-news/rajnath-singh-greets-personnel-on-186th-rising-day-of-assam-rifles20210324104702/>

**Q.2)** Which of the following Para-military force guards the Indo-Nepal border?

- a) Central Reserve Police Force
- b) Central Industrial Security Force
- c) Indo-Tibetan Border Police
- d) Sashastra Seema Bal

**ANS: D**

**Explanation:** The border patrol teams have also been asked to remain extra alert in Uttarakhand near the Kalapani area.

While the ITBP guards the India-China border, the SSB guards the Indo-Nepal and Bhutan border — to heighten vigilance.

Source: <https://www.newindianexpress.com/nation/2020/sep/03/amid-lac-standoff-forces-at-nepal-border-told-to-be-extra-alert-mha-sources>.

**Q.3)** Which of the following Para-military force was called as the Crown Representative Police?

- a) CISF
- b) SSB
- c) CRPF
- d) ITBP

**ANS: C**

**Explanation:** The Central Reserve Police Force (CRPF) is the premier central police force of the Union of India for internal security.

Originally constituted as the Crown Representative Police in 1939, it is one of the oldest Central Para military forces (now termed as Central Armed Police Force).

Source: <https://crpf.gov.in/history-crpf.htm>

**Q.4)** Which agency is a federal contingency world class force to deal with anti-terrorists activities in all its manifestations?

- a) National Security Guard
- b) Anti-terrorists Squad
- c) Central Reserve Police Force

d) Research & Wing Analysis

**ANS: A**

**Explanation:**

NSG is Federal Contingency World Class Zero Error Force to deal with anti-terrorist activities in all its manifestation. The NSG is a Force specially equipped and trained to deal with specific situations and is therefore, to be used only in exceptional circumstances to thwart serious acts of terrorism.

**Ethos :** The Ethos of the NSG is premised on the following:-

- Pursuit for excellence
- Lead from the front.
- Zero Error.
- Speed, surprise, stealth, precision and accuracy are its hall marks.

Source: <https://www.nsg.gov.in/about-us/about-nsg>

**Q.5)** Consider the following statements regarding Central Industrial Security Force:

1. It was established by executive resolution.
2. It provides security to the premises staff along with the security of property and establishments.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** CISF is an armed force of the Union established under an Act of Parliament, "Central Industrial Security Force Act, 1968 (50 of 1968)".

- In the year 1969, the strength of the force established with the help of 3129 personnel, was increased to 1,41,421 as of 01.03.2020.
- CISF has 12 reserve battalions, 08 training institutes and 63 other formations.
- According to the mandate, CISF provides security to the premises staff along with the security of property and establishments.
- CISF is providing security to the strategic establishment, including the Department of Space, the Department of Atomic Energy, the Airports, the Delhi Metro, the ports, the historical monuments and the basic areas of Indian economy such as petroleum and natural gas, electricity, coal, steel and mining.
- CISF is providing protection to some private sector units and important government buildings in Delhi.
- Presently, CISF is also providing security to the protected persons classified as Z Plus, Z, X, Y.
- CISF is the only force with a customized and dedicated fire wing.

Source: <https://www.cisf.gov.in/cisfeng/about-us/>

**Q.6)** Which of the following force is a compensatory cost force?

- a) CISF
- b) SSB
- c) CRPF

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d) NSG

**ANS: A**

**Explanation:** CISF is a compensatory cost force.

Source: <https://www.cisf.gov.in/cisfeng/about-us/>

**Q.7)** Which force is deployed on border guarding duties from Karakoram Pass in Ladakh to Jachep La in Arunachal Pradesh covering 3488 km of Indo-China Border?

- a) CRPF
- b) CISF
- c) SSB
- d) ITBP

**ANS: D**

**Explanation:** ITBPF was raised on 24 Oct, 1962. Presently, ITBP is deployed on border guarding duties from Karakoram Pass in Ladakh to Jachep La in Arunachal Pradesh covering 3488 km of Indo-China Border and manning Border Outposts on altitudes ranging from 9000' to 18700' in the Western, Middle and Eastern sectors of the Indo-China Border.

- ITBPF is a specialized mountain force and most of the officers and men are professionally trained mountaineers and skiers.
- Being the first responder for natural disaster, ITBPF has been carrying out numerous rescue and relief operations across the country.

Source: <https://www.itbpolice.nic.in/indexenglish.html>

**Q.8)** “Lawalong Wildlife Sanctuary” is located in which of the following state?

- a) Kerala
- b) Arunachal Pradesh
- c) Jharkhand
- d) Chhattisgarh

**ANS: C**

**Explanation:** Lawalong Wildlife Sanctuary was set up in 1978 to the southwest of Hazaribagh in the Chhotanagpur plateau area.

- It covers an area of about 211 sq. kms. The terrain is undulating and dissected by rivers and streams.
- Located in the south-west part of Chatra district, Lawalong sanctuary has a rich wildlife, including tiger and bison.
- Different species of birds and serpents are also found here.
- A variety of wildlife including Tiger, Panther, Hyena, Spotted Deer, Wild Boar, Nilgai are available in this sanctuary.

Source: The Hindu

**Q.9)** Which of the following is/are consists of “River valleys” of Arunachal Pradesh?

1. The Siang Valley
2. The Kameng Valley
3. The Tirap Valley

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** All three valleys are located in Arunachal Pradesh.

- Rivers constitute an important part of the topography of the state. Arunachal Pradesh is divided into five major river valleys: 1. The Siang Valley 2. The Kameng Valley 3. The Subansiri Valley 4. The Lohit Valley 5. The Tirap Valley.
- These valleys are named after the important rivers of the state.
- The major rivers and their tributaries traversing the state are Siang, Kameng, Subansiri, Subansiri, Lohit, Tirap etc.
- All these and other countless rivers and rivulets are fed by snow from the Himalayas. Therefore, mostly these small rivulets are perennial in nature.

Source: Shodhganga

**Q.10)** Consider the following statements regarding “The World Commission on Environmental Law (WCEL)”:

1. It advances environmental law around the globe by providing specialized knowledge and assistance to strengthen the legal foundations of the conservation of nature and sustainable development.
2. WCEL functions as an integral part of the International Court of Justice (ICJ).

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** The World Commission on Environmental Law (WCEL) advances environmental law around the globe by providing specialized knowledge and assistance to strengthen the legal foundations of the conservation of nature and sustainable development through the conceptual advancement of environmental principles, norms, and laws, and by building the capacity of communities to benefit from the environmental rule of law.

WCEL functions as an integral part of the IUCN Environmental Law Programme (ELP) that includes close collaboration with the Environmental Law Centre (ELC).

Source: UNFCCC

## Revision

**Q.1)** Consider the following statements regarding the Global Hunger Index (GHI) 2019:

1. It is released by Food and Agriculture Organization (FAO).
2. India has improved its GHI score continuously from 2000 to 2019.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** The GHI has been brought out almost every year by Welthungerhilfe (lately in partnerships with Concern Worldwide) since 2000.

- In 2018, India was ranked 103 out of 119 countries. In 2000, the country was ranked 83 out of 113 countries. Now, with 117 countries in the fray, it has dropped to 102.
- India is ranked 102 of 117 countries in the Global Hunger Index 2019, behind its neighbours Nepal, Pakistan and Bangladesh.
- It's GHI score has also decelerated — from 38.9 in 2005 to 32 in 2010 and then from 32 to 30.3 between 2010 and 2019.
- The GHI score is calculated on four indicators — undernourishment; child wasting, the share of children under the age of five who are wasted (that is, who have low weight for their height, reflecting acute under-nutrition); child stunting, children under the age of five who have low height for their age, reflecting chronic under-nutrition; and child mortality, the mortality rate of children under the age of five.

Source: The Hindu

**Q.2)** Which of the following report/reports is/are released by World Bank?

1. Global Economic Prospect Report.
2. Global Financial Development Report.
3. Global Financial Stability Report.

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** Both Global Economic Prospect Report and Global Financial Development Report are released by World Bank.

NOTE: Global Financial Stability Report is released by International Monetary Fund (IMF).

Source: World Bank

**Q.3)** “Sargent plan” during British period in India is related to which of the following?

- a) Education
- b) Finance
- c) Partition
- d) Railways

**ANS: A**

**Explanation:** The goal of the Sargent plan was the reorganization of the entire education system of India. The commission under the chairmanship of the John Sargent submitted its report to the Central Advisory Board of Education C.A.B.E in (1944). This scheme of post war educational development was mainly focused on the quality enhancement of higher education (ie. university system).

Recommendations-

- Pre-primary basic school for 3-6 years age group.
- Compulsory and free education for 6-14 year age group.
- High school education of two types – Academic & Technical and Vocational.
- Refresher courses for teachers and better salary for them.
- Abolition of intermediate courses.
- Standard of the universities must be raised.
- Admission should be restricted so only the capable students can go for the higher education.

Source: Spectrum

**Q.4)** Consider the following statements regarding the financial stability report (FSR):

1. It is released biannually by Reserve Bank of India.
2. It is approved by sub-committee of Financial Stability and Development Council (FSDC) before it is published.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The Financial Stability Reports (FSR), published by Reserve Bank of India, after approved by FSDC Sub-Committee since its inception, taking inputs from financial sector regulators i.e. RBI, SEBI, PFRDA, IRDAI including Ministry of Finance, are periodic exercise for reviewing the nature, magnitude and implications of risks that may have a bearing on the macroeconomic environment, financial institutions, markets and infrastructure.

- These reports will also assess the resilience of the financial sector through stress tests.
- FSR is a biannual publication.

Source: ForumIAS factly

**Q.5)** Consider the following statements regarding the Cabinet Committee on Investment and Growth (CCIG):

1. It was created in 2014 to promote capital investment and growth of the economy.
2. It is headed by finance minister.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** In June 2019, the Union government formed two cabinet committees — one on Investment, the other on Employment and Skill Development.

The Prime Minister constitutes Standing Committees of the Cabinet and sets out the specific functions assigned to them. He can add or reduce the number of committees.

**Investment:** The Cabinet Committee on Investment will “identify key projects required to be implemented on a time-bound basis”, involving investments of Rs 1,000 crore or more, or any other critical projects, as may be specified by it, with regard to infrastructure and manufacturing.

- It will prescribe time limits for giving requisite approvals and clearances by the ministries concerned in identified sectors.
- It will also monitor the progress of such projects.

**Employment:** The Cabinet Committee on Employment and Skill Development is supposed to provide “direction to all policies, programmes, schemes and initiatives for skill development aimed at increasing the employability of the workforce for effectively meeting the emerging requirements of the rapidly growing economy and mapping the benefits of demographic dividend”.

- It is required to enhance workforce participation, foster employment growth and identification, and work towards removal of gaps between requirement and availability of skills in various sectors.
- The panel will set targets for expeditious implementation of all skill development initiatives by the ministries and to periodically review the progress in this regard.

The addition of the two committees is indicative of the new focus areas for the government.

The goal of both is new jobs.

Source: The Hindu

**Q.6)** Which of the following committee is related to anti-defection law?

- a) Halim Committee
- b) Santhanam Committee
- c) Bhagwan Sahay Committee
- d) None

**ANS: A**

**Explanation:** The Dinesh Goswami Committee on Electoral Reforms, the Law Commission of India and the National Commission to Review the Working of the Constitution has recommended a review of the anti-defection law.

- The issues arising out of the decisions given by different Presiding Officers and the interpretation of the law by various courts were discussed at the Conferences of Presiding Officers of Legislative Bodies in India as well.
- In view of the near unanimity among the Presiding Officers for a review of the law, the then Speaker of Lok Sabha and Chairman of the Conference, Shri G.M.C. Balayogi constituted in October 1998 a Committee of Presiding Officers headed by the Speaker of the West Bengal Legislative Assembly, Shri Hashim Abdul Halim, to go into different aspects of the matter.
- The Committee presented its Report in February 2003 recommending inter alia that the provisions relating to splits and mergers be deleted from the Tenth Schedule; the terms 'voluntarily giving up membership' and 'political party' are defined; and that a time frame is laid down for decisions on the anti-defection cases.

Source: Laxmikanth



**Q.7)** “Public Interest Foundation & Others vs Union of India 2018” case is related to which of the following?

- a) Criminalisation of Politics
- b) Gender Inequality
- c) Right to Privacy
- d) Right to Education

**ANS: A**

**Explanation:** The Supreme Court’s constitution bench, in its judgment in Public Interest Foundation & Others v Union of India, 2018 explains its limitations in preventing those charged with heinous offences from becoming legislators and finds that Parliament alone is competent to do so.

It satisfies itself by appealing to Parliament to make a law for this purpose on priority and issues a few directions to the Election Commission and the political parties to make the disclosure of the criminal antecedents of candidates contesting elections sufficient and clear to the voters, so that the latter could be warned not to vote the candidates, charged with serious offences.

Source: Laxmikanth

**Q.8)** Which of the following committee (s) is/are related to Defence in British India?

- 1. Skeen Committee
- 2. Chatfield Committee
- 3. Babington Smith Committee

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** The crucial link between the founding of a military academy and the attainment of independence was acutely realized by a section of Indian leadership in the days of struggle for independence, whose concerted efforts resulted in the recommendations of the Montague Chelmsford Reforms Committee that enabled ten Indians for receiving training at Sandhurst for induction as commissioned officers;

- Setting up of the Skeen Committee in 1925 and later holding of Round Table Conference in London in 1930, which recommended the establishment of the Indian Sandhurst.
- As a follow up action, a committee was set up under the chairmanship of Field Marshal Sir Philip Chetwode, the then Commander-in-Chief of India, to work out modalities for establishment of an Indian Sandhurst.
- In Jul 1931, the committee recommended establishment of a military academy for induction of 40 Gentlemen Cadets (GC) in each term comprising 15 as Direct Entries, 15 from the ranks through Kitchner College, Nowgaon and 10 from princely states.
- The training span was initially envisaged for three years but later reduced to two and a half years.

Source: Spectrum

**Q.9)** Which of the following Act (s) is/are passed during the period of Indira Gandhi?

1. The Benami Transactions (Prohibition) Act.
2. Maintenance of Internal Security Act (MISA).
3. Monopolies and Restrictive Trade Practices Act (MRTP).

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: C**

**Explanation:** Important acts were passed during the period of Indira Gandhi.

- Maintenance of Internal Security Act, 1971 (MISA): A controversial law which gave the then Prime Minister Indira Gandhi and law enforcement gave absolute power to search and seize properties without a warrant, put individuals under preventive detention and use wiretapping.
- Monopolies and Restrictive Trade Practices Act, 1969 (MRTP): The objective of the Act was to restrict monopolistic trade activities and to maintain the economy of the country in balance. In short, the law was to make sure that the wealth of the country does not remain concentrated in the hands of the rich.
- Foreign Exchange Regulation Act, 1973 (FERA): What is now popularly known as FEMA, the Foreign Exchange Management Act, 1999 was called FERA back in 1973. The Act aimed to regulate foreign payments and investments and the conversion of foreign exchange.
- The Coal Mines (Nationalization) Act, 1973: Acquisition, transfer of right, title and interest of the owners of coal mines was covered under the law.

Source: NCERT

**Q.10)** Which of the following pair (s) is/are correctly matched?

Committee	:	Organization
1. Sivaraman Committee	:	NABARD
2. B.D. Kumar Committee	:	EXIM Bank
3. Sukomoy Chakravarty committee	:	SIDBI Bank

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** The B.D. Kumar Committee, which submitted its report in 1975, recommended for setting up of an export-import Bank type institution to finance and promote exports of engineering goods and turnkey projects.

The Reserve Bank of India (RBI) at the insistence of the Government of India, constituted a Committee to Review the Arrangements For Institutional Credit for Agriculture and Rural Development (CRAFICARD) to look into these very critical aspects.

- The Committee was formed on 30 March 1979, under the Chairmanship of Shri B. Sivaraman, former member of Planning Commission, Government of India.
- Its recommendation was formation of a unique development financial institution which would address these aspirations and formation of National Bank for

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Agriculture and Rural Development (NABARD) was approved by the Parliament through Act 61 of 1981.

Source: ForumIAS

ForumIAS

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## *International Relations*

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**Q.1)** Recently, which of the following country led a UN resolution to set up a separate convention on cybercrime?

- a) Israel
- b) Iran
- c) China
- d) Russia

**ANS: D**

**Explanation:** The Russian proposal entitled “Countering the use of information and communications technologies for criminal purposes” was recently put forth in the United Nations General Assembly (UNGA).

- India voted in favour of a cybercrime resolution led by Russia in a committee of the United Nations General Assembly.
- The resolution seeks to set up new cyber norms considered as counter alternative to the US backed Budapest Accord.

Source: The Hindu

**Q.2)** The term “2010 Strategic Concept” is related to which of the following?

- a) NATO
- b) Warsaw Pact
- c) Nuclear Non-Proliferation Treaty (NPT)
- d) START treaty

**ANS: A**

**Explanation:** Strategic Concepts lay down the Alliance’s core tasks and principles, its values, the evolving security environment and the Alliance’s strategic objectives for the next decade.

The 2010 Strategic Concept defines NATO’s cores tasks as: collective defense, crisis-management and cooperative security.

Source: Indian Express

**Q.3)** Which of the following agreement/agreements is/are signed by India and United States of America (USA)?

1. General Security of Military Information Agreement (GSOMIA).
2. Logistics Exchange Memorandum of Agreement (LEMOA).
3. Basic Exchange and Cooperation Agreement for Geo-spatial Cooperation (BECA).

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** Agreements signed by India and USA.

- India had signed the General Security of Military Information Agreement (GSOMIA) in 2002 and the Logistics Exchange Memorandum of Agreement (LEMOA) in 2016.

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- The last one remaining is the Basic Exchange and Cooperation Agreement for Geo-spatial Cooperation (BECA) is not yet signed by India.

FOUNDATIONAL AGREEMENTS		
<b>Logistics Exchange Memorandum of Agreement (LEMOA)</b>	<b>Communication Interoperability &amp; Security Memorandum Agreement (CISMOA)</b>	
<ul style="list-style-type: none"><li>Provide logistic support, refuelling &amp; berthing facilities for each other's warships &amp; aircraft on barter/equal-value exchange basis</li></ul>	<ul style="list-style-type: none"><li>Technology enabler to help transfer high-tech avionics, encrypted communication &amp; electronic systems to India</li></ul>	<ul style="list-style-type: none"><li>US says CISMOA will boost 'interoperability' as well as ensure secrecy of its C4ISR (command, control, communications, computer, intelligence, surveillance and reconnaissance) systems</li></ul>
<ul style="list-style-type: none"><li>Will not involve stationing of US troops on Indian soil. Nor will India extend support if US goes to war with "a friendly country"</li></ul>	<ul style="list-style-type: none"><li>But fears that US will be able to track &amp; snoop on Indian warships/aircraft equipped with such systems</li></ul>	
<ul style="list-style-type: none"><li>Good for US forces re-balancing to Asia Pacific. Indian forces rarely operate far away from their shores but access to Djibouti &amp; Diego Garcia could be useful</li></ul>	<b>Basic Exchange &amp; Cooperation Agreement for Geo-Spatial Cooperation (BECA)</b>	<ul style="list-style-type: none"><li>US says BECA will help India with advanced satellite &amp; topographical data for long-range navigation &amp; missile-targeting</li><li>But India, which has its own satellite imaging capabilities, unwilling for American digital sensors to be positioned on its soil</li></ul>

Source: The Hindu

**Q.4)** Which of the following treaty/treaties is/are related to European Union?

- Treaty of Lisbon
- Treaty of Nice
- Treaty of Amsterdam

Select the correct answer using the code given below:

- 1 only
- 1 and 2 only
- 2 only
- 1, 2 and 3

**ANS: D**

**Explanation:** The European Union is based on the rule of law. This means that every action taken by the EU is founded on treaties that have been approved voluntarily and democratically by all EU member countries. A treaty is a binding agreement between EU member countries. It sets out EU objectives, rules for EU institutions, how decisions are made and the relationship between the EU and its member countries. The main treaties are:

Treaty of Lisbon: Signed on 13 December 2007, to make the EU more democratic, more efficient and better able to address global problems, such as climate change, with one voice.

Treaty of Nice: Signed on 26 February 2001, to reform the institutions so that the EU could function efficiently after reaching 25 member countries.

Treaty of Amsterdam: Signed on 2 October 1997, to reform the EU institutions in preparation for the arrival of future member countries.

Source: ForumIAS

**Q.5)** Consider the following statements regarding BASIC group:

- The member countries of the group consist of India, Brazil, South Korea and China.
- The main objective of the group is to promote industrialization.

Which of the statements given above is/are correct?

- 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** The BASIC group was formed as the result of an agreement signed by the four countries on November 28, 2009.

- They are a bloc of four large newly industrialized countries – Brazil, South Africa, India and China.
- The main objective of the BASIC group is to have a broadly common position on reducing greenhouse gas emissions and raising the massive funds that are needed to fight climate change.

Source: ForumIAS

**Q.6)** Consider the following statements regarding the Eurasian Economic Union (EAEU):

1. The Eurasian Economic Union is an international organization for regional economic integration.
2. All Central Asian countries except Turkmenistan and Russia are member countries of Eurasian Economic Union.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: A**

**Explanation:** The Eurasian Economic Union is an international organization for regional economic integration. It has international legal personality and is established by the Treaty on the Eurasian Economic Union.

- The EAEU provides for free movement of goods, services, capital and labor, pursues coordinated, harmonized and single policy in the sectors determined by the Treaty and international agreements within the Union.
- The Member-States of the Eurasian Economic Union are the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, the Kyrgyz Republic and the Russian Federation.
- The Union is being created to comprehensively upgrade, raise the competitiveness of and cooperation between the national economies, and to promote stable development in order to raise the living standards of the nations of the Member-States.

Source: ForumIAS

**Q.7)** Consider the following statements regarding the Organization of the Petroleum Exporting Countries (OPEC):

1. OPEC is a permanent, Informal organization.
2. OPEC membership is open to any country that is a substantial exporter of oil and which shares the ideals of the organization.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The Organization of the Petroleum Exporting Countries (OPEC) was founded in Baghdad, Iraq, with the signing of an agreement in September 1960 by five countries namely Islamic Republic of Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. They were to become the Founder Members of the Organization.

- OPEC is a permanent, intergovernmental organization.
- The current OPEC members are the following: Algeria, Angola, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, and the Republic of the Congo, Saudi Arabia (the de facto leader), the United Arab Emirates and Venezuela. Ecuador, Indonesia and Qatar are former members.
- OPEC's objective is to co-ordinate and unify petroleum policies among Member Countries, in order to secure fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the industry.
- OPEC membership is open to any country that is a substantial exporter of oil and which shares the ideals of the organization.

Source: OPEC

**Q.8)** Consider the following statements regarding the Agreement on Prohibition of Attacks against Nuclear Installations and Facilities:

1. It is a multilateral agreement between the nuclear weapon states.
2. It is entered into force in 1971.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: D**

**Explanation:** Both India and Pakistan have exchanged their list of nuclear installations under the bilateral agreement.

- The list was handed over in accordance with Article-II of the Agreement on Prohibition of Attacks against Nuclear Installations and Facilities between Pakistan and India, signed on December 31, 1988, the Foreign Office (FO).
- The agreement was entered into force on January 27, 1991, provides, inter alia, that the two countries inform each other of nuclear installations and facilities to be covered under the agreement on the first of January of every calendar year.

Source: ForumIAS

**Q.9)** The term "Protecting Power" is recently in news is related to which of the following?

- a) Diplomatic relations
- b) Foreign exchange reserves
- c) Defense treaties
- d) Bilateral defense exercises

**ANS: A**

**Explanation:** Following the killing of Iranian military and intelligence commander Major General Qassem Soleimani in Baghdad in a drone attack carried out by the United States, the Iranian government registered its protest with the Swiss Embassy in Tehran.

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- Switzerland represents the interests of the US in Iran. This is because the US itself does not have an embassy there. Iran's interests in the United States, on the other hand, are represented by the Pakistan Embassy in Washington.
- In an arrangement such as this, Switzerland is the "Protecting Power" of the United States' interests in Iran. The instrument of Protecting Powers is provided for under the 1961 and 1963 Vienna Conventions on Diplomatic Relations.
- "If diplomatic relations are broken off between two States, or if a mission is permanently or temporarily recalled... the sending State may entrust the protection of its interests and those of its nationals to a third State acceptable to the receiving State," the 1961 Vienna Convention states.
- And the 1963 Convention reiterates: "A sending State may with the prior consent of a receiving State, and at the request of a third State not represented in the receiving State, undertake the temporary protection of the interests of the third State and of its nationals."

Source: Indian Express

**Q.10)** Which of the following are the priority areas of regional cooperation within the framework of the East Asia Summit (EAS)?

1. Environment and energy
2. Pandemic diseases
3. Finance
4. Natural Disaster Management
5. Security

Select the correct answer using the code given below:

- a) 1, 2, 3, 4 and 5
- b) 1, 2, 3 and 4 only
- c) 2, 3, 4 and 5 only
- d) 1, 2 and 4 only

**ANS: B**

**Explanation:** The East Asia Summit is a unique Leaders-led forum of 18 countries of the Asia-Pacific region formed to further the objectives of regional peace, security and prosperity.

- It has evolved as a forum for strategic dialogue and cooperation on political, security and economic issues of common regional concern and plays an important role in the regional architecture.
- Established in 2005, EAS allows the principal players in the Asia-Pacific region to discuss issues of common interest and concern, in an open and transparent manner, at the highest level.
- The membership of EAS consists of ten ASEAN Member States (i.e. Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand, the Philippines and Vietnam), Australia, China, India, Japan, New Zealand, Republic of Korea, Russian Federation and the USA.
- EAS is an initiative of ASEAN and is based on the premise of the centrality of ASEAN.
- There are six priority areas of regional cooperation within the framework of the EAS. These are – Environment and Energy, Education, Finance, Global Health Issues and Pandemic Diseases, Natural Disaster Management, and ASEAN Connectivity.
- India endorses regional collaboration in all six priority areas.

Source: ForumIAS



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## *International Relations*

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**Q.1)** Which of the following are the founder members of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)?

1. Bangladesh
2. India
3. Sri Lanka
4. Myanmar
5. Bhutan
6. Nepal
7. Thailand

Select the correct answer using the code given below:

- a) 1, 2, 3, 4 and 7 only
- b) 1, 2, 5, 6 and 7 only
- c) 1, 2, 3 and 7 only
- d) 1, 2 and 3 only

**ANS: C**

**Explanation:** The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional organization comprising seven Member States lying in the littoral and adjacent areas of the Bay of Bengal constituting a contiguous regional unity.

- This sub-regional organization came into being on 6 June 1997 through the Bangkok Declaration.
- It constitutes seven Member States: five deriving from South Asia, including Bangladesh, Bhutan, India, Nepal, Sri Lanka, and two from Southeast Asia, including Myanmar and Thailand.
- Initially, the economic bloc was formed with four Member States with the acronym 'BIST-EC' (Bangladesh, India, Sri Lanka and Thailand Economic Cooperation).
- Following the inclusion of Myanmar on 22 December 1997 during a special Ministerial Meeting in Bangkok, the Group was renamed 'BIMST-EC' (Bangladesh, India, Myanmar, Sri Lanka and Thailand Economic Cooperation).
- With the admission of Nepal and Bhutan at the 6th Ministerial Meeting (February 2004, Thailand), the name of the grouping was changed to 'Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation' (BIMSTEC).

Source: ForumIAS factly

**Q.2)** Which of the following country is recently re-joined the Commonwealth group?

- a) Sri Lanka
- b) Syria
- c) Oman
- d) Maldives

**ANS: D**

**Explanation:** The Maldives re-joined the Commonwealth, more than three years after the Indian Ocean island nation quit the association amid mounting criticism of its human rights record then.

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- In 2016, the Maldives pulled out of the Commonwealth terming “unjust” the grouping’s decision to penalise the country over former President Mohamed Nasheed’s controversial ouster in 2012.
- It followed the Commonwealth Ministerial Action Group (CMAG)’s warning to Maldives of suspension from the bloc, voicing “deep disappointment” over the country’s lack of progress in resolving the political crisis during former President Abdulla Yameen’s presidency, whose authoritarian slant sparked concern domestically and internationally.

Source: The Hindu

**Q.3)** Consider the following statements regarding the G-20:

1. It is an inter-governmental treaty between 19 member countries and European Union.
2. It was created after the collapse of Soviet Russia to promote economic growth among developing and developed countries.
3. It has members from every continent.

Which of the statements given above is/are NOT correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: B**

**Explanation:** The Group of Twenty, or the G20, is the premier forum for international economic cooperation.

- The G20 brings together the leaders of both developed and developing countries from every continent.
- Collectively, G20 members represent around 80% of the world’s economic output, two-thirds of global population and three-quarters of international trade.
- Throughout the year, representatives from G20 countries gather to discuss financial and socioeconomic issues.
- Originated in 1999 at the level of Finance Ministers and Central Bank Governors, the G20 gathered for high-level discussions on macro-financial issues.
- In the wake of the 2008 global financial crisis, the G20 was elevated to include the leaders of member countries.
- The first G20 Leaders’ Summit took place in Washington D.C. in November 2008.
- Consequently, the G20 agenda expanded beyond macro-financial issues, to include socio-economic and development issues.

Source: Indian Express

**Q.4)** Which of the following country is NOT part of QUAD?

- a) Australia
- b) South Korea
- c) Japan
- d) India

**ANS: B**

**Explanation:** In a significant development for the region, the Quadrilateral Strategic Dialogue (“the Quad”) between India, Australia, Japan and the U.S. held its first Minister-level meeting since it was revived in 2017.

- The group is seen as a regional counter-weight to China and has only met at the Joint or Assistant Secretary level since 2017.

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- Members of the Quad, barring Australia, are currently engaged in the annual Malabar exercises – military exercises that started between India and the U.S. in 1994 and became trilateral (with Japan) in 2015.
- India has not permitted Australia to participate in these exercises, concerned about what message it would send to China, which is wary of the exercise.

Source: The Hindu

**Q.5)** Consider the following statements regarding the Association of World Election Bodies (A-WEB):

1. It is the largest association of Election Management Bodies (EMBs) worldwide.
2. The permanent secretariat of A-WEB is located at Seoul.
3. Election Commission of India hosted the 4th General Assembly of Association of World Election Bodies (A- WEB) at Bengaluru.

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** The Association of World Election Bodies (A-WEB) is the largest association of Election Management Bodies (EMBs) worldwide.

- It is established on October 14, 2013 in Song-do, South Korea and the permanent secretariat is located at Seoul.
- Representatives from election bodies in over 50 countries will congregate in Bengaluru to share their electoral experience with programmes connected to the Fourth General Assembly of the Association of World Election Bodies (A-WEB).
- Currently, the A-WEB has 115 members and 20 regional associations/ organizations as associate members.
- The members include 24 from Asia, 37 from Africa, 31 from America, 17 from Europe, and six from Oceania.
- The ECI will continue to remain on the executive board of the A-WEB for 2021–23 in its capacity as immediate former chair of the A-WEB.

Source: The Hindu

**Q.6)** Which of the following Multilateral Export-Control Regime is also called as London Club?

- a) Nuclear Suppliers Group
- b) MTCR
- c) Wassenaar arrangement
- d) Australia Group

**ANS: A**

**Explanation:** The Nuclear Suppliers Group (NSG) first met in November 1975 in London, and is thus popularly referred to as the “London Club”. It is a Group of nuclear supplier countries that seek to prevent nuclear proliferation by controlling the export of materials, equipment and technology that can be used to manufacture nuclear weapons.

Source: The Hindu

**Q.7)** Which of the following countries are Baltic nations?

1. Estonia
2. Latvia
3. Lithuania

Select the correct answer using the code given below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

**ANS: D**

**Explanation:** Baltic States, the northeastern region of Europe, includes the countries of Estonia, Latvia, and Lithuania, on the eastern shores of the Baltic Sea.

- Vice President M Venkaiah Naidu concluded his 5-day tour to the three Baltic nations Lithuania, Latvia and Estonia in August 2019.
- The visit was aimed at strengthening the bilateral engagements with the three nations, besides giving the relationships a fresh impetus in the context of a changing global order.
- Besides considering the strategic interests, the focus of the visit was also on improving cooperation in the fields of security, especially countering terrorism.

Source: Oriental Black swan

**Q.8)** The term “hometown diplomacy” is a bilateral relation between India and which of the following country?

- a) China
- b) United States of America
- c) Japan
- d) Russia

**ANS: A**

**Explanation:** On April 1, 2020, China and India usher in the important moment of the 70th anniversary of the establishment of diplomatic relations.

- Looking back at the past 70 years, China-India relations have moved ahead despite wind and rain and gone through an extraordinary development path.
- In the 1950s, the leaders of the older generation of the two countries made the historical decision to establish diplomatic relations between China and India, and jointly advocated the Five Principles of Peaceful Coexistence.
- "Hindi Chini Bhai Bhai" (Indians and Chinese are brothers) resounded throughout our two countries.
- From the 1980s, the two sides agreed to solve the boundary question through peaceful and friendly consultation, established strategic and cooperative partnership for peace and prosperity, and achieved all-round development of bilateral relations.

Source: The Hindu

**Q.9)** Consider the following statements regarding the Eastern Economic Forum (EEF):

1. EEF was established in 2010 and forum conducts its meetings biannually.
2. India pledged to extend \$ 10 billion line of credit to Russia's far eastern region at 5<sup>th</sup> EEF.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2

d) Neither 1 nor 2

**ANS: D**

**Explanation:** The Eastern Economic Forum was established by decree of the President of the Russian Federation Vladimir Putin in 2015 to support the economic development of Russia's Far East and to expand international cooperation in the Asia-Pacific region.

Unveiling the Russian edition of India's 'Look East, Act East' policy, Prime Minister Narendra Modi pledged on September 2019 to extend a \$1 billion Line of Credit to Russia's Far East region (RFE).

Source: The Hindu

**Q.10)** The Global Forum on Remittances, Investment and Development (GFRID) is related to which of the following?

- a) The United Nations Conference on Trade and Development
- b) The United Nations Industrial Development Organization
- c) World Economic Forum
- d) International Fund For Agricultural Development (IFAD)

**ANS: D**

**Explanation:** The Global Forum on Remittances, Investment and Development (GFRID) brings together key decision makers, stakeholders and practitioners who are engaged in the field of remittances and migration for development.

- Since its first forum in 2007, IFAD has gathered over 1,000 participants from the public and private sector, and the civil society, to facilitate the creation of partnerships and the exchange of best practices in maximizing the impact of remittances to the benefit of migrants' communities of origin.
- In doing so, IFAD partners with key international financial institutions and other prominent organizations, such as the European Commission (2015) and the United Nations Department of Economic and Social Affairs (2017).
- The forum is held biannually, in conjunction with the observance of the International Day of Family Remittances (IDFR) on 16 June.

Source: UN IFAD

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## *International Relations & Organizations*

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**Q.1)** “Partnerships for Affordable Healthcare Access and Longevity (PAHAL) – project” is often seen in news is launched with the help of which of the following nation?

- a) France
- b) Japan
- c) Israel
- d) United States of America

**ANS: D**

**Explanation:** Partnerships for Affordable Healthcare Access and Longevity (PAHAL) is USAID flagship innovative financing platform to promote health financing models and provide catalytic support to social enterprises (IBMs) for improving access to affordable and quality healthcare solutions for the urban poor communities, with a focus on Tuberculosis, Maternal and Child Health and WASH.

- PAHAL has built a platform that provides unparalleled access to social enterprises for reducing cost and improving access to quality healthcare services.
- US announced that it will provide an additional \$3 million to India, through its aid agency USAID, for mitigating the spread of Covid-19.
- In coordination with the Indian government, USAID is providing these funds to the Partnerships for Affordable Healthcare Access and Longevity (PAHAL) project.

Source: ForumIAS

**Q.2)** “The freedoms of the air are a set of commercial aviation rights granting a country's airlines the privilege to enter and land in another country's airspace”. With reference to the freedom of air, which of the following statements is/are correct?

1. Total six freedoms of air rights formed by International Civil Aviation Organization (ICAO).
2. The sixth freedom of air includes the right to fly from a foreign country to another while stopping in one's own country for non-technical reasons.

Select the correct answer using the code given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: B**

**Explanation:** The freedoms of the air (9 rights) are a set of commercial aviation rights granting a country's airlines the privilege to enter and land in another country's airspace.

- The Freedom of air was formulated in the Convention on International Civil Aviation of 1944, known as the Chicago Convention.
- The fifth freedom of air includes the right to fly between two foreign countries on a flight originating or ending in one's own country.
- The sixth freedom of air includes the right to fly from a foreign country to another while stopping in one's own country for non-technical reasons.

Source: The Hindu

**PRELIMS MARATHON COMPILATION FOR THE MONTH OF MARCH 2021**

**Q.3)** “Loya Jirga or Grand Council” is often seen in news is related to which of the following country?

- a) Nepal
- b) Bhutan
- c) Bangladesh
- d) Afghanistan

**ANS: D**

**Explanation:** A Loya Jirga, or "grand council", is a mass national gathering that brings together representatives from the various ethnic, religious, and tribal communities in Afghanistan.

- The gathering involves participation of Afghan tribal elders, religious figures, and political leaders.
- The Loya Jirga is a centuries-old institution that has been convened at times of national crisis or to settle national issues.
- Historically, it has been used to approve a new constitution, declare war, choose a new king, or to make sweeping social or political reforms.
- It is considered the "highest expression" of the Afghan people, but it is not an official decision-making body.

Source: The Hindu

**Q.4)** “Most Favoured Nation (MFN)” is often seen in news is related to which of the following International Organization?

- a) International Monetary Fund
- b) United Nations
- c) World Economic Forum
- d) World Trade Organization

**ANS: D**

**Explanation:** According to the MFN principle of the WTO’s General Agreement on Tariffs and Trade (GATT), each of the WTO member countries should “treat all the other members equally as ‘most-favoured’ trading partners.”

- If a special favour such as a lower customs duty rate is grant to someone by a nation, then it has to do the same for all other WTO members.
- Thus, in effect it means non-discrimination.
- Recently, India withdrew the Most Favored Nation (MFN) status from Pakistan.

Source: WTO

**Q.5)** “Asia Reassurance Initiative Act (ARIA)” is recently in news is an initiative of which of the following country?

- a) Russia
- b) China
- c) Japan
- d) United States of America

**ANS: D**

**Explanation:** US President has signed ARIA act to counter the threat from China and to reinvigorate US leadership in the Indo-Pacific region.

- It aims to establish a multifaceted U.S. strategy to increase U.S. security, economic interests, and values in the Indo-Pacific region.

## **PRELIMS MARATHON COMPILATION FOR THE MONTH OF MARCH 2021**

- The new law mandates actions countering China's illegal construction and militarization of artificial features in the South China Sea and coercive economic practices.
- ARIA recognizes the vital role of the strategic partnership between the U.S. and India in promoting peace and security in the Indo-Pacific region and it calls for strengthening diplomatic, economic, and security ties between both the countries.
- It allocates a budget of \$1.5 billion over a five year period to enhance cooperation with America's strategic regional allies in the region.

Source: The Hindu

**Q.6)** The term "Industrial Security Annex (ISA)" is often seen in news is a bilateral arrangement between which of the following countries?

- a) India and Russia
- b) India and Japan
- c) India and USA
- d) India and France

**ANS: C**

**Explanation:** The Industrial Security Annex (ISA), signed between India and the U.S. at the second 2+2 dialogue in Washington, will open the door for U.S. defence companies to partner with the Indian private sector for several multi-billion dollar deals in the pipeline, especially the deal for 114 fighter jets.

- The ISA is a part of the General Security Of Military Information Agreement (GSOMIA), which India signed with the U.S. long back.
- It became critical as India opened up the defense sector to the private sector and the Strategic Partnership policy, which has few big military platforms and is reserved for the Indian private sector. U.S. companies are in the race for multi-billion dollar deal for 114 fighter jets, among other deals.

Source: ForumIAS factly

**Q.7)** The "Information Fusion Centre for Indian Ocean Region (IFC-IOR)" is often seen in news is located in which of the country?

- a) India
- b) Thailand
- c) Sri Lanka
- d) Maldives

**ANS: A**

**Explanation:** The Information Fusion Centre for the Indian Ocean Region (IFC-IOR), an initiative of the Indian Navy and supported by the Government of India launched in December 2018, has started functioning.

The IFC-IOR has been established at Gurugram along with the Information Management and Analysis Centre, jointly administered by the Indian Navy and Indian Coast Guard.

Source: ForumIAS factly

**Q.8)** "Bishkek Declaration" is related to which of the following Organization?

- a) World Trade Organization
- b) UNCTAD
- c) Shangai Cooperation Oranization
- d) Asia Pacific Economic Cooperation (APEC)



**ANS: C**

**Explanation:** India and other members of the SCO condemned terrorism in all its forms and manifestations, and called on the international community to promote cooperation in combating the menace.

According to the Bishkek Declaration of the Shanghai Cooperation Organization's Heads of State Council, the member states stressed that acts of terrorism and extremism cannot be justified.

Source: ForumIAS factly

**Q.9)** The "Inter-Governmental Negotiations (IGN)" is often seen in news is related to which of the following?

- a) UN Security Council reforms.
- b) UN resolution on International Terrorists.
- c) World Bank Group
- d) International Solar Alliance

**ANS: A**

**Explanation:** The G4 nations of Brazil, Germany, Japan and India have asserted that the mandate of the United Nations' Inter-Governmental Negotiations is to achieve the long-pending reforms of the UNSC and not endlessly debate it.

- The Inter-Governmental Negotiations (IGN) format has long outlived its sell-by date and must be made transparent to ensure progress on the reform discussions, they said.
- India has been calling for the reform of the UN Security Council (UNSC) along with Brazil, Germany and Japan for long, emphasising that it rightly deserves a place at the UN high table as a permanent member.
- The G4 nations support each other's bids for permanent seats on the UNSC.

NOTE: In 2008 the General Assembly adopted Decision 62/557 "to commence intergovernmental negotiations (IGN) in informal plenary of the General Assembly".

- Up until the 22008 Decision was adopted, discussions on Security Council reform were nothing more than an oral exchange of views.
- With the creation of the IGN, the aim was have a text on which discussions could be based.
- The first round of the IGN was held on 19 February 2009.
- The General Assembly has renewed its mandate annually, and it remains the principal vehicle for Council reform discussions today.
- To date, the IGN has not been able to agree on a text to be negotiated

Source: The Hindu

**Q.10)** Consider the following statements regarding the "International Court of Justice (ICJ)":

1. The ICJ was established in 1945 by the same constitutive instrument as the Security Council, the UN Charter, to act as the principal judicial organ of the UN.
2. Judgments given in contentious cases between states are binding on the parties.

Which of the statements above given is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**ANS: C**

**Explanation:** The UN Charter envisioned a symbiotic relationship between the Security Council and the International Court of Justice (ICJ), the principal judicial organ of the UN.

- However, the Council has scarcely made use of the ICJ as an instrument, or “tool”, in the exercise of its responsibility for the maintenance of international peace and security.
- In its latest research report on the rule of law of 20 December 2016, Security Council Report examines the relationship between the Security Council and the ICJ, including options for enhancing that relationship to assist the Council in its work.
- The ICJ was established in 1945 by the same constitutive instrument as the Security Council, the UN Charter, to act as the principal judicial organ of the UN.
- The Statute of the Court is annexed to the Charter itself, meaning that all UN member states are automatically parties to the Statute.
- The ICJ is mandated to settle contentious legal disputes submitted by states against other states in accordance with international law.
- Judgments given in contentious cases between states are binding on the parties.
- The Court also gives advisory opinions to the Council, the General Assembly and other authorized bodies on legal questions referred to it by these entities.

Source: ICJ