| TEST CODE | 6 | 9 | 3 | 1 | 1 | 6 | FIAS – GS Advanced 2023 – B1 – Half Length Test | #16 |

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Time Allowed : One and Half Hours
समय : डेढ़ घंटे

ForumIAS

Maximum Marks : 125
अधिकतम अंक : **125**

GENERAL STUDIES / सामान्य अध्ययन

Name Of Candidate परीक्षार्थी का नाम				
Roll No./अनुक्रमांक		Medium/माध्यम	English ☐	हिंदी ☐
Center Code/परीक्षा केंद्र		Date/दिनांक		

*Center Code : For Online – 1900 / Delhi : Karol bagh – 1901, ORN - 1902, Mukharji Nagar - 1903 / Patna : Boring Rd. – 2001 / Hyderabad : Jawahar Nagar - 2101

INDEX TABLE / अनुक्रमणिका

Q. No. प्र.सं.	Max. Marks अधिकतम अंक	Marks Obtained प्राप्तांक
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
Total/कुल अंक	125	
Evaluator's Discretion/मूल्यांकन कर्त्ता का विवेक :		
Total Marks/कुल अंक :		

*Evaluator's Discretion is the marks awarded at the discretion of the evaluator based on your overall impression, on the basis of (but not limited to) your handwriting, presentation, use of diagrams, flowcharts, facts and figures or absolutely anything that he/she liked in your copy.

मूल्यांकन कर्त्ता का विवेक अंक, आपकी लिखावट, प्रस्तुति, आरेखों के उपयोग, फ़्लोचार्ट, तथ्यों और आंकड़ों या समग्र रूप किसी अन्य विषय वस्तु, जो मूल्यांकन कर्त्ता को आपकी कॉपी में पसंद आयी के आधार पर (लेकिन इन्हीं तक सीमित नहीं) पर दिए गए अंक हैं।

INSTRUCTION / अनुदेश

1. Please do furnish Name, Email, Roll No and Mobile in the answer sheet.
कृपया उत्तर–पुस्तिका में नाम, ईमेल, रोल नंबर और मोबाइल नंबर भरें।

2. There are SEVEN questions printed in ENGLISH & HINDI, all questions are compulsory.
उत्तर पुस्तिका में अंग्रेजी / हिंदी में सात प्रश्न दिए गए हैं, सभी प्रश्न अनिवार्य हैं।

3. The number of marks carried by a question/part is indicated against it.
प्रत्येक प्रश्न / भाग के लिए निर्धारित अंक उसके सामने अंकित किए गए हैं।

4. Answers must be written in the medium authorized in the admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided.
उत्तर प्रवेश पत्र में अधिकृत माध्यम में लिखे जाने चाहिए, जो कि दिए गए स्थान में इस प्रश्न–सह–उत्तर (क्यूसीए) पुस्तिका के कवर पर स्पष्ट रूप से लिखा जाना चाहिए।

5. Word limit in questions, if specified, should be adhered to. Any page or portion of the page left blank in the Question-Cum Answer Booklet must be clearly Struck off.
प्रश्नों में शब्द सीमा, यदि निर्दिष्ट हो, का पालन किया जाए। प्रश्न–सह–उत्तर पुस्तिका में खाली छोड़े गये किसी भी पृष्ठ या पृष्ठ के भाग को स्पष्ट रूप से काट दें।

For Student Only / केवल परीक्षार्थी प्रयोग हेतु

Start Time/प्रारंभ करने का समय :	End Time/समाप्त करने का समय :
Mode Of Examination/ परीक्षा की विधि :	Online/ऑनलाइन ☐ Offline/ऑफलाइन ☐

For Office Use Only / केवल कार्यालय प्रयोग हेतु

ECN CODE/ ईसीएन कोड :	EG/ईजी :	Evaluation Date/ मूल्यांकन तिथि :

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Parameters	Excellent	Very Good	Good	Average	Poor	Very Poor
Language						
Structure						
Presentation						
Handwriting						
Content						
Attempt						

ADDITIONAL REMARKS

① Dark matter refers to hypothetical form of matter that constitutes 85% of total mass of universe.

It is difficult to detect because :-

① it does not interact with electromagnetic radiation / light.

② it can only be observed by experimentation (e.g. lensing).

③ requires high powered / long range telescopes to observe the effect of dark matter.

④ has a lot of unknown properties.

shaped pursuit of science

① key component of general theory of relativity and thus contributed significantly to scientific literature.

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(2) necessary for understanding expansion of universe

⎧ dark matter results in contraction
⎩ dark energy for expansion

(3) help understand evolution of universe and cosmic background radiation and red shift.

(4) gravitational lensing understood by dark matter

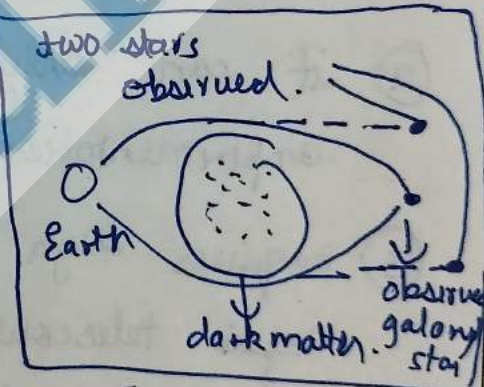(5) string theory, spatial theory and reconciling of gravity in standard model necessiates dark matter research

(6) understand Higgs Boson and LHC experiment.

Fig : gravitational lensing

two stars observed.
O Earth
dark matter. galaxy star
observer

(7) gravitational waves observation.

In quest for understanding laws of physics and unified field theory, dark matter is a crucial research point.

② The recent nod of <u>DMH-11</u> or GM-mustard has put the focus back on genetically modified organisms.

Negative consequences of GMO

① human health risk due to 3rd generation effects.

② privacy concerns (1.9) genome sequencing.

③ ecosystem risks (pose challenge to ecological diversity especially pollinators)

④ ethical concerns ⟨ god based ethics: man playing god.
intergenrational consent (1.9) designer babies.

⑤ monopoly of MNC (1.9) monsanto: trait fees and terminator gene technology?

⑥ side effects (1.9 vaccines and impact on heart health).

⑦ soil degradation (1.9) in areas of Bt cotton).

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8. false claims (e.g. despite tall claims, Bt cotton vulnerable to pink bollworm).

9. traditional knowledge replaced (e.g. indigenous varieties of crops).

10. high inequality (high cost of genetic engineering).

Advantages justify risk

1. human health (e.g. mRNA vaccine for corona)

2. predictive health (via genome sequencing)

3. climate smart agriculture (B4 wheat variety with low inputs).

4. food fortification (e.g. golden rice).

5. one health paradigm (e.g. vaccines for cattle ; pest control via Pgsit).

6. strengthen R&D ecosystem and provide skilled labour.

7. preserve species from extinction

8. energy security (algae based biofuels).

Thus, biotechnological progress should have human and ecosystem first approach and requires robust international co-operation.

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3(o) Work culture refers to forms of interaction, procedures, beliefs, priorities in an organization. Ethical work culture focuses on stakeholder centricity and foundational values of honesty, transparency, tolerance, integrity etc.
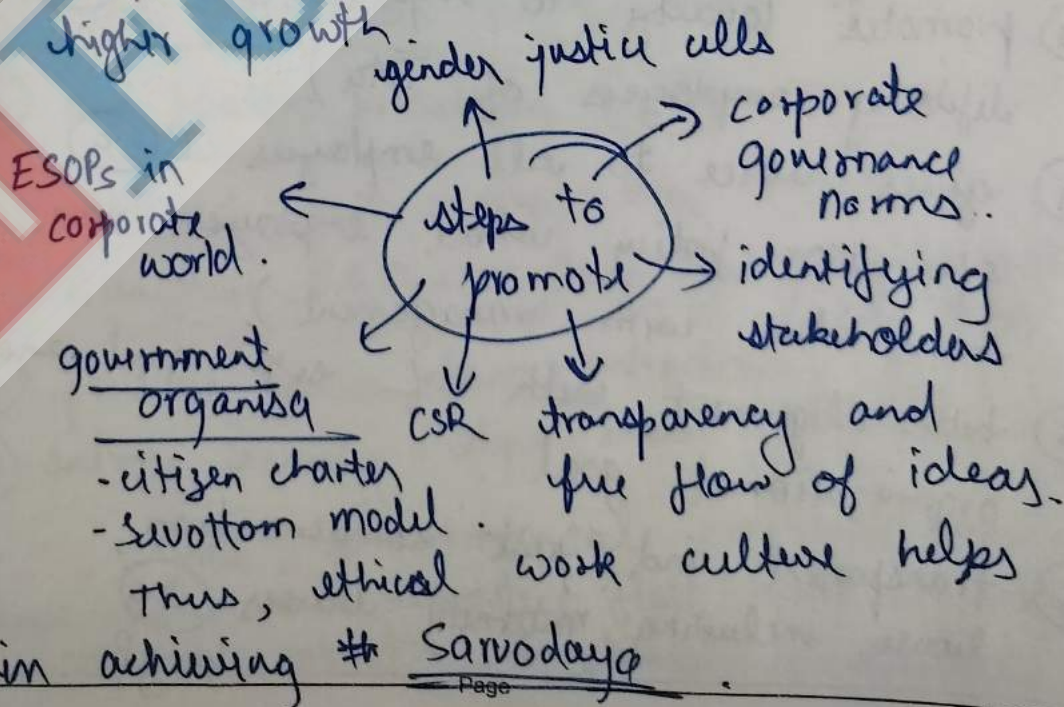
Ethical work culture ensures job satisfaction

① assures and promotes meritocracy (e.g performance based appraisal).

② trust of stakeholders ensured.

③ promotes loyalty to organisation (e.g lifelong employees of Tata).

④ gives voice to all employees (e.g open door policy where employees can share ideas with management).

⑤ better alignment with of self goal and organizational goal.

⑥ transparent and just compensation, leaves including maternity leaves (e.g google.

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Ensures organizational success

1. creates a dedicated cadre of workforce (reduce employer aquisition cost).
2. boosts worker productivity (e.g making employees part of business via ESOPS).
3. customer loyalty and brand value. (e.g Tata).
4. <u>different viewpoints supported</u> → leads to better ideas (<u>Anekantvada</u>:- truth has multiple sides).
5. According to <u>mckinsey report</u>, companies with racial diversity have higher growth.

ESOPs in corporate world.

government organise
- citizen charter
- suvottom model.

<u>steps to promote</u>

gender justice cells

→ corporate governance norms.
→ identifying stakeholders

CSR transparency and free flow of ideas.

thus, ethical work culture helps in achieving # <u>Sarvodaya</u>.

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3(b)   Citizen charter refers to a document by a government office highlighting the services provided, the mechanism, time frame and penalty.

Citizen charter tool for effective public service delivery.

① ensures accountability of officers.

② highlight the bottlenecks of administration.

③ makes governance efficient and effective.

④ ensures ease of living of citizens by reducing confusion, wait time.

⑤ treats citizens as customers (2nd ARC report).

⑥ reduced chances of corruption.

principles of citizen charter
- Quality
- choice
- standards
- value
- accountability
- transparency

However, it is unable to achieve objectives because:-

① lack of capacity building and process reform.

② lack of updation (1:9 mobile number of old nodal officers)

③ doesn't follow stakeholder consultation in formulation. (2nd ARC)

④ not present in vernacular language.

⑤ not a legal document with punishment for non-enforcement.

⑥ <u>tough to draft</u> → multiple functions performed by officers ; new jobs added due to vacancy and additional charge.

⑦ lack of awareness

periodic evaluation → step model
⑥ 7 ① (ARC)
(measures)
⑤ ④ ③ ② digitization for process reform.
reduce valancy and ensure capacity building. Sevottam model.
increase funds.

such steps will ensure <u>Sabka Saath</u>, <u>Sabka Vikas</u> and <u>Sabka Vishwas</u>.

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3(c) Right to public services act ensures efficient and effective provision of services to citizens. It is a key reform to ensure citizen centric administration.

RPSA leading to Ethical governance.

① ensure provision of rights based entitlement (e-g health, education).

② Ensure development of capabilities. (Amartya Sen :- realisation focussed view of justice).

③ ensure transparency and accountability.

④ Ensure sarvajan hitaye, sarvjan sukhaye via providing housing, water etc.

⑤ Provide expansive definition of right to life as enunciated by supreme court.

RPSA leading to effective governance.

① time bound provision of services.

② fixes accountability of departments and officers (better performance appraisal)

③ identify bottlenecks in governance. ("the chain is as strong as weakest link").

④ pooling of resources (e.g. Samagra vedika of Telangana government).

⑤ inclusive society via governance at doorstep. (Dwar Praday yojana - MP)

challenges
→ lack of financial capacity. (high fiscal deficit).
→ lack of cooperation & cross - sharing among departments.
→ data issues (e.g. census data outdated).
→ lack of portability of benefits.
→ high population burden.

legislations like Right to health bill (Rajasthan) and, Right to education and 5T model (Odisha) can be good starting points.

4(a)   According to 2nd ARC

monopoly + discretion - transparency = corruption

some people argue that it greases the wheel of growth.

① efficient decision making (reduces red tape).

② reduces clearances and thus improves infrastructure growth

③ creates global champion companies. (e.g rise of engineering companies during Nazi germany).

④ gives free hand to the private sector and also source of motivation for government employees.
         However, this is a false notion and only highlights one side of the equation :-

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① cronyism [cronyism] hurts competition, shifts burden on consumers (Economic survey)

② A just society is an efficient and sustainable society (e.g democratic countries preferred by large MNCs).

③ corruption leads to social crisis (e.g riots, civil war in African countries.

④ increases inequality in society.

⑤ rodes moral fabric of society.

⑥ increases repression, denial of human rights (e.g protests in china).

⑦ leads to environmental degradation.

⑧ results in poor governance (Rajiv Gandhi remarked that out of ₹1 that leaves Delhi only 15 paise reaches the beneficiary).

Thus, corruption has intragenerational and intergenerational negatives consequences and must be tackled to digitisation, criminal justice system reforms, pro-competition policies and independent institutions
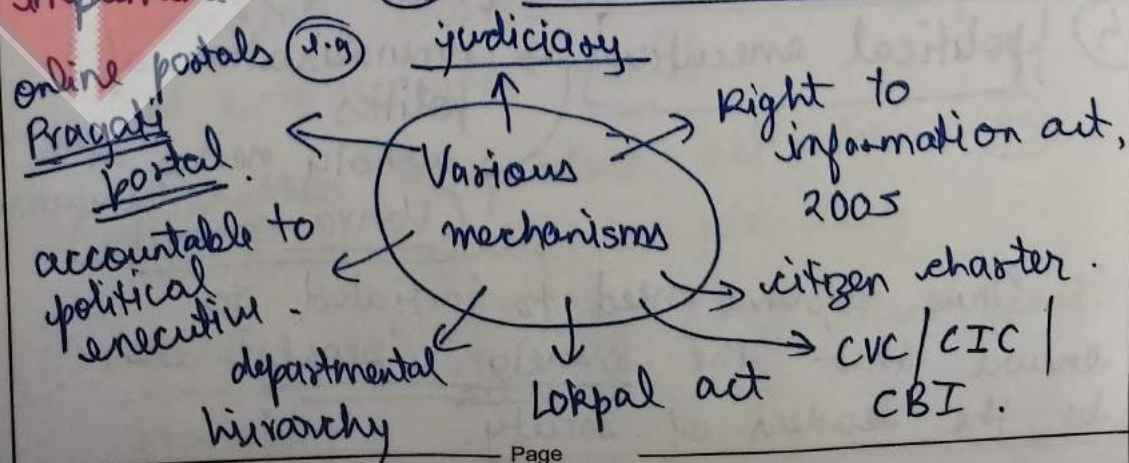
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4 (b)   accountability means answerability.
In a democracy, every public official
in answerable to the citizen.

Administrative accountability leads to
answerability for action and inaction,
the mechanisms for decision taking and
reduces graft. ('Sunlight is the best
disinfectant : supreme court)

It allows for increasing
citizen empowerment for being part of
audit and provide inputs for policy
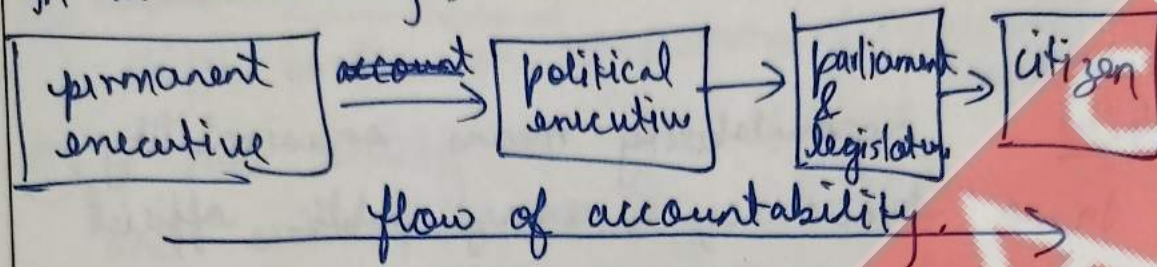implementation (i.g) social audit of MGNREGA
online portals (i.g) judiciary

Pragati portal.

accountable to
political
executive.

Various
mechanisms

Right to
information act,
2005

departmental
hierarchy

Lokpal act

citizen charter.

CVC / CIC /
CBI.

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In a democracy,

| permanent executive | → account → | political executive | → | parliament & legislature | → | citizen |

flow of accountability.

Challenges

① RTI → vacancies in CIC/SIC
→ data not kept in format
→ dilution of law via amendment
→ wide exceptions (Sec 8-11)
→ non-capacity building of PIO.

② judiciary → burdened and slow pace (5 crore cases pending).

③ citizen based → lack of awareness
→ lack of capacity building.
→ power asymmetry.
(2nd ARC).

④ political executive → criminalisation of politics.
→ unholy nexus with bureaucrats) (Vohra committee)

Thus reforms need to initiated to ensure that the sovereign (people) can be the leaders of society.

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4(c). According to world bank, there are 8 attributes of good governance → consensus oriented, responsive, accountable, participatory, transparent, rule of law and efficient and effective.

It involves responsibility by administration

① public disclosure of government steps under RTI.

② Future oriented policies (e.g) skill India, make in India.

③ improving ease of living. (e.g) digital kyc.

④ providing governance at doorstep (e.g) TN e-governance model.

⑤ strengthen independent institutions (e.g) reducing vacancy in judiciary.

⑥ Reaching the last mile ((e.g) direct benefit transfer).

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⑦ protecting the vulnerable (u.g) PM - garib

kalyan anna yojana.

But also involves, responsibility of
public

① Being aware of one's rights and
ask critical questions.

② Helping in governance of country.
(u.g) performing fundamental duties.

③ taking part in reform ((u.g)
Lokpal bill after India against
corruption).

④ helping reach consensus (i.g) debating
on critical issues.

⑤ protecting the vulnerable (i.g) citizens'
collective during corona.

Thus, to make India an empowered
India, responsibility should be of
both citizens and administration.

(5) 5y is the next generation cellular technology providing speeds up to 10 gbps, low network latency and high connection density.

Applications

① 9oT → enable high connectivity via network slicing.

② infrastructure → smart grids
→ power systems
(e.g) intelligent lighting system.
⤷ intelligent transport system
} ease of living.

③ reduce digital divide by improving connectivity to rural areas.

④ education : enable immersive learning via big data, JoT, AI.
⤷ use metaverse and other tools.

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⑤ [medicine | health] ——→ remote patient monitoring
→ perform efficient surgical operations by tracking real time vitals' status.
→ enable tele-medicine [track patients immersive diagnosis via 3D models].

⑥ growth of autonomous vehicles and self driving cars.

⑦ [defence] ——→ optimised and intelligent logistical management.
→ intelligent defence systems to counter drones / missiles.
→ improve surveillance, reconaissance.
→ strengthen border infrastructure [CIMBS]

[challenges]
① high capital costs (routers, cables, stations, fibre layout)

② high price of spectrum.

③ possible cronyism challenges (e.g) 2G allocation

⑤ cyber protection as Chinese companies like Huawei bidding

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(5) chances of interference with other frequency bands.

(6) lack of private sector participation post Covid.

(7) [structural telecom issues] →→ AGR sharing.
→ issue of VoIP, social media like whatsapp enabling calls reducing profit of telecom operators.

(8) digital divide [low fibre length in rural areas].

5g	v/s	predecessors

5g
① speed upto 10 gbps - 20 gbps.

② allow network slicing [different bandwidth and latency for sub-network]

③ high reliability

④ low latency (<5ms)

⑤ high connection density

predecessors
① speed upto 1 gbps (4g).

② no such feature.

③ low reliability.

④ high latency.

⑤ 1/10th of 5g in 4g.

Thus, 5g should be rolled out in a transparent manner by keeping in mind demand of various stakeholders.

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(6) Biotechnology is defined as utilization of biological resources and process for welfare of humanity.

<u>Biotechnology improving agricultural productivity</u>.

① <u>Increase yield</u> (e.g India 2nd largest producer of cotton after Bt cotton).

② <u>increase shelf life</u> (e.g flavr savr tomato).

③ <u>Reduce input need</u> (e.g B4 variety of wheat).

④ <u>ensure climate smart agriculture</u>.

⑤ <u>hybrid varieties development</u> (e.g DMH-11)

⑥ <u>food fortification</u> (e.g golden rice)

⑦ <u>pest resistance</u> (e.g nematode resistant tobacco).

⑧ <u>artificial breeding</u>. (e.g Dolly sheep).

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⑨ waste to energy (microbial fuel cell; 4th generation biofuel)

⑩ genome sequencing (predictive application of pesticides etc.).

However, there are <u>criticisms</u> and <u>apprehension</u>

criticism	apprehension
① monopoly of MNC (e.g. monsanto via terminator gene).	① impact on human health (3rd generation effects).
② high use of pesticides.	② biodiversity loss.
③ tall claims (e.g Bt cotton vulnrable to pink bollworm).	③ replacement of traditional knowledge.
④ Rights of farmers (conflict between TRIPS and I TPYRFA (seed treaty).	④ soil health impacts (adverse)
	⑤ ethical concerns (e.g man playing god via genetic modification of animals).

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Way forward

① robust approval mechanism via adequate safeguards and stakeholder consultation.

② international co-operation (👍)

[Cartagena protocol] on biosafety).

③ capacity building of farmers (👍)

Bt cotton needed to be grown alongwith traditional varieties for ensuring pest resistance).

④ transparent research process via scientific social responsibility.

⑤ encourage domestic companies to prevent monopoly, allow GM crops without terminator gene [Economic survey - 2017].

Such steps will ensure achievement of [SDGs] (no hunger, good health and climate action).

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⑦ Nanotechnology refers to utilization of properties of particles of nanoscale (1-100 nm) for benefit of humanity.

Nanotechnology and socio-economic development

① agriculture
→ improve input efficiency (e.g. nano urea) by IFFCO
→ nano-barcodes and nano processing to monitor quality of produce.
→ practice precision agriculture.
→ help in plant disease resistance.

② health-care
→ precision delivery of drugs via nanocapsules
→ help in drug discovery.
→ nanoflares for detection of cancer.

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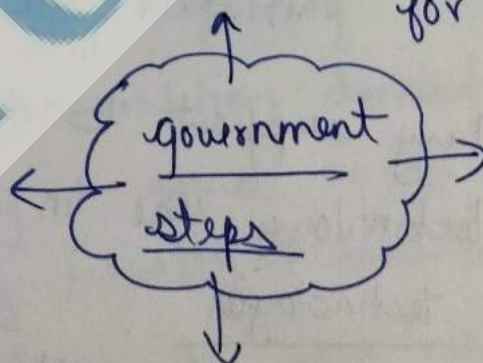Candidates must not write on this margin

③ Rep nano-paints increase albedo and thus help in fighting heat stress (heat stress will lead to productivity loss of 34 million full time jobs by 2030)

④ energy
→ nano batteries for battery storage.
→ waste processing and recycling

⑤ space
→ reduce weight of equipment.
→ reduce reliance on rare Earths by changing properties of materials.

nano urea and guidelines for agricultural use.
↑
government steps
nano technology regulatory board ←
→ nano science and technology initiative, 2001 for infrastructure development.
↓
Nano mission 2007
∘ R&D and international collaboration.

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low R&D spend (0.7% GDP u/s 4% Israel).

challenges

→ lack of specialised course :- old civil, mechanical, material science curriculum.

high capital costs; low industry-academia linkage.

lack of skilled manpower (only 46% engineer employable)

Way forward

① **Education** —

→ specialised courses in IITs/ NITs/ agricultural universities.

→ international colloboration u.g iCET.

→ problem solving via initiative like IMPRINT.

② Higher budgetary support to R&D; higher nanotechnology use in ISRO/ DRPO for spinoff technologies.

③ Research on health impacts and strengthening regulatory board.

Nanotechnology can thus help India leapfrog by reducing input cost, support resource efficiency and creating new opportunities.