Q.1) For $\frac{1}{3} < x < y < 2$, which of the following statements is/are always correct?

I. $x + \frac{1}{x} < y + \frac{1}{y}$

II. $\frac{\sqrt{1+y^2}}{y} < \frac{\sqrt{1+x^2}}{x}$

Select the answer using the code given below.

a) I only

b) II only

c) Both I and II

d) Neither I nor II

Ans) b

Exp) Option b is the correct answer.

Given:

1/3 < x < y < 2

Therefore:

a) x and y are positive

b) y > x

To Find: Which of the two statements are always correct.

Statement I: x + (1/x) < y + (1/y)

Since y > x > 0, we have:

1/x > 1/y

Now:

a) x < y

b) but 1/x > 1/y

So one term increases while the other decreases. Hence, we cannot conclude directly.

Take an example:

x = 1/2, y = 1

Then:

x + (1/x) = 1/2 + 2 = 2.5

y + (1/y) = 1 + 1 = 2

Thus: 2.5 < 2

This is false.

Therefore, Statement I is not always correct.

Statement II:

$\sqrt{(1 + y^2)}/y < \sqrt{(1 + x^2)}/x$

Since x and y are positive: $\sqrt{(1 + y^2)}/y = \sqrt{[(1 + y^2)/y^2]} = \sqrt{(1 + 1/y^2)}$

Similarly: $\sqrt{(1 + x^2)}/x = \sqrt{(1 + 1/x^2)}$

Now $y > x > 0$

Therefore: $1/y < 1/x$

Squaring: $1/y^2 < 1/x^2$

Adding 1: $1 + 1/y^2 < 1 + 1/x^2$

Taking square root on both sides: $\sqrt{(1 + 1/y^2)} < \sqrt{(1 + 1/x^2)}$

Hence: $\sqrt{(1 + y^2)}/y < \sqrt{(1 + x^2)}/x$

So Statement II is always correct.

Conclusion:

a) Statement I → Not always true

b) Statement II → Always true

Therefore, Option b is the correct answer.

Q.2) What is the minimum number of times one needs to measure to get 298 litres of water from a tank, if the measuring cylinders have capacities 1 litre, 6 litres, 25 litres and 100 litres?
a) 4
b) 5
c) 9
d) 13

Ans) b
Exp) Option b is the correct answer.

Given:
We are required to obtain **exactly 298 litres** using the least number of measurements from available containers of **100 L, 25 L, 6 L, and 1 L**.

The key idea is to minimize the number of operations by using **largest capacities first**, since they reduce the count of steps significantly.

We first draw 100 litres thrice using the 100L container. Then after the third withdrawal we pour water from the 100L container into the 1L container until it is full. We then empty the 1L container and repeat the process again so that we are left with 98L in the 100L container.

Therefore, we can obtain 298L by measuring for 5 times which is the minimum value.

Therefore, Option b is the correct answer.

Q.3) There are four types of weights, namely 1 kg, 2 kg, 5 kg and 10 kg. What is the maximum number of different ways one can measure 20 kg, if at least eight but not more than eleven weights of 1 kg are to be used while measuring?
a) 7
b) 8
c) 9
d) 10

Ans) b
Exp) Option b is the correct answer.
Given:

Available weights:

a) 1 kg
b) 2 kg
c) 5 kg
d) 10 kg

Total weight required = 20 kg

Number of 1 kg weights used must be between 8 and 11.

To Find: Number of different ways to measure 20 kg.

Method:

Let:

a) x = number of 1 kg weights
b) y = number of 2 kg weights
c) z = number of 5 kg weights
d) w = number of 10 kg weights

Then: $x + 2y + 5z + 10w = 20$ where $8 \leq x \leq 11$

Case 1: x = 8

Equation becomes:

2y + 5z + 10w = 12

Possible solutions:

a) y = 1, z = 0, w = 1

b) y = 1, z = 2, w = 0

c) y = 6, z = 0, w = 0

Total ways = 3

Case 2: x = 9

Equation becomes:

2y + 5z + 10w = 11

Possible solution:

a) y = 3, z = 1, w = 0

Total ways = 1

Case 3: x = 10

Equation becomes:

2y + 5z + 10w = 10

Possible solutions:

a) y = 0, z = 0, w = 1

b) y = 0, z = 2, w = 0

c) y = 5, z = 0, w = 0

Total ways = 3

Case 4: x = 11

Equation becomes:

2y + 5z + 10w = 9

Possible solution:

1. y = 2, z = 1, w = 0

Total ways = 1

Total Number of Ways = 3 + 1 + 3 + 1 = 8

Therefore, Option b is the correct answer.

Q.4) A cut on a solid object divides the object into two parts where the new surfaces thus produced are plane. On the other hand, one single cut can be used to cut more than one object at a time. In an experiment, the total number of pieces produced by applying n cuts is denoted by x_n. The experiment is performed on a solid cube where pieces remain unmoved after each cut. In this experiment, if after the third cut, the pieces are identical, then which of the following is ***not*** a possible value for x_4?
a) 16
b) 12
c) 8
d) 5

Ans) a
Exp) Option a is the correct answer.

Given:

a) A solid cube is cut repeatedly by plane cuts.

b) Pieces remain unmoved after every cut.

c) After the third cut, all pieces are identical.

d) $x_□$ denotes the total number of pieces after n cuts.

To Find: Which value is **not possible** for x_4.

Arrangement after 3 cuts

To obtain identical pieces after 3 cuts, the cube must be divided symmetrically.

The natural configuration is 3 mutually perpendicular cuts through the cube.

Thus:

a) After 1st cut → 2 identical pieces

b) After 2nd cut → 4 identical pieces

c) After 3rd cut → 8 identical smaller cubes

Therefore: $x_3 = 8$

These 8 cubes form a fixed 2 × 2 × 2 arrangement.

Analyze the 4th cut

Now a fourth plane cut is introduced.

The important geometric fact is:

a) The 4th plane intersects the previous 3 cutting planes.

b) These intersections form 3 straight lines on the 4th plane.

In plane geometry:

a) 3 lines can divide a plane into at most 7 regions.

Each region corresponds to one smaller cube being cut.

Hence, the 4th plane can intersect at most 7 of the 8 small cubes.

So, at least one cube always remains uncut.

Maximum possible value of x_4

Initially there are: 8 pieces

If at most 7 cubes can be cut, then at most 7 new pieces can be created.

Therefore: $x_4 \leq 8 + 7 = 15$

Hence: $x_4 = 16$ is impossible.

Checking the Options

Option (a): 16

Impossible because the maximum possible number of pieces after the 4th cut is 15.

Option (b): 12

Possible.

A plane can cut exactly 4 cubes: 8 + 4 = 12

Option (c): 8

Possible.

If earlier cuts form 4 slabs and the 4th cut only rearranges/divides accordingly, total pieces can remain effectively 8.

Option (d): 5

Possible.

If the first 3 cuts are parallel:

a) 3 cuts produce 4 slabs

b) 4th parallel cut produces 5 slabs

Thus: $x_4 = 5$ is possible.

Therefore, Option a is the correct answer.

Q.5) The class average x in a test increases by 4 when the score of a student is rectified, whose corrected score is 100 instead of 0. Later, the score of another student was found to have been recorded as 81 in place of 56. If there are no other corrections and the final corrected average is y, then y-x is

a) 2
b) 3
c) 5
d) 6

Ans) b
Exp) Option b is the correct answer.

Given:

a) A student's marks are corrected from 0 to 100.

b) Due to this correction, the class average increases by 4.

c) Another student's marks were recorded as 81 instead of 56.

d) Final corrected average is y.

To Find: Value of y − x

Find the number of students

Let the number of students be n.

Increase in total marks due to first correction: 100 − 0 = 100

Increase in average = 4

Therefore, 100/n = 4

So, n = 25

Hence, the class has 25 students.

Analyze the second correction

The marks were recorded as 81 instead of 56.

Thus, the total marks were previously overcounted by: 81 − 56 = 25

So, after correction, total marks decrease by 25.

Find the net change in average

Overall changes from the original average:

a) First correction: +100 marks

b) Second correction: −25 marks

Net change in total marks: 100 − 25 = 75

Therefore, net change in average: 75/25 = 3

Thus, y − x = 3

Therefore, Option b is the correct answer.

Directions for the next 3 (three) items :
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

When SARS-CoV-2 was first detected in 2019, it was a truly novel virus for the world. At that time, no one in the world had been exposed to SARS-CoV-2 or had specific immunity against it. In contrast, people across the world have been exposed to HMPV for decades and the virus is well-studied. HMPV and SARS-CoV-2 belong to two very different virus families with fundamentally different characteristics and epidemiology, with strong seasonality seen in HMPV, unlike SARS-CoV-2. Both viruses cause different severity of symptoms, particularly over the long term, and the affected population segments do not fully overlap. In general, HMPV causes milder illness with deaths being very rare and with no long-term post-viral symptoms.

Q.6) Which of the following conclusions is/are valid?
1. Though SARS-CoV-2 and HMPV are similar viruses with somewhat different epidemiology, the former became a pandemic because it was novel and people had not been exposed to it in the past.
2. The two viruses have fundamentally different impacts on human populations and should not therefore be dealt with in a similar manner.
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
Exp) Option b is the correct answer.
Statement 1 is incorrect. The passage clearly states that "**HMPV and SARS-CoV-2 belong to two very different virus families**".
Statement 2 is correct. The passage states that "**both viruses cause different severity of symptoms, particularly over the long term, and the affected population segments do not fully overlap**." From

here we can conclude that the two viruses have fundamentally different impacts on human populations and thus should not be dealt with in a similar manner.

Q.7) Which of the following reflect the intent of the writer in the above passage?

1. To evolve methodologies for objective analysis of the two viruses
2. To establish the epidemiological similarities and differences between the two viruses
3. To offer a better understanding of the remedies of HMPV when analysed in conjunction with SARS-CoV-2

Select the answer using the code given below.

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) None of the above

Ans) d

Exp) Option d is the correct answer.

Statement 1 is incorrect. The author of the passage compares the impact of two viruses and **does not propose a new methodology for their analysis**.

Statement 2 is incorrect. The passage notes that the viruses have "**fundamentally different characteristics and epidemiology**". Therefore, statement 2 is incorrect.

Statement 3 is incorrect. The author **does not discuss remedies for the treatment of HMPV or SARS-CoV-2.** Therefore, statement 3 is also incorrect.

Q.8) Which of the following statements reflect the logical and rational inferences that can be drawn from the passage?

1. HMPV has, historically, had longer documentation of studies when compared with SARS-CoV-2.
2. The two viruses are different from each other and this results in markedly different outcomes amongst those affected.
3. Long-term impacts of the two viruses are dissimilar and this is an important differentiator between them.
4. One of the common factors between the two viruses is seasonal specificity.

Select the answer using the code given below.

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

Ans) b

Exp) Option b is the correct answer.

Statement 1 is correct. The passage states that "When **SARS-CoV-2** was first detected in 2019, it was a **truly novel virus** for the world." On the other hand, it mentions that "people across the world had been exposed to **HMPV** for decades and the virus is **well studied**"

Statement 2 is correct. The passage notes that the viruses have "**fundamentally different characteristics and epidemiology**". Further it mentions "**both viruses cause different severity of**

symptoms, particularly over the long term, and the affected population segments do not fully overlap."
Statement 3 is correct. This statement follows from statement 2 and is also mentioned in the passage as "**HMPV causes milder illness with deaths being very rare and with no long-term post-viral symptoms.**"
Statement 4 is incorrect. The passage clearly mentions that **seasonality is a factor that is associated with HMPV unlike SARS-CoV-2.**

Q.9) Three variables x, y and z take values 2, 3, 4 or 5 such that their values are always distinct. If M and N denote the largest possible value and the smallest possible value, respectively, for the expression {(x × y) + z}; then M - N is
a) 11
b) 12
c) 13
d) 14

Ans) c
Exp) Option c is the correct answer.

Given:

- x, y and z are distinct numbers.
- Possible values are 2, 3, 4 and 5.
- Expression: (x × y) + z

To Find:

Value of M − N, where:

a) M = largest possible value

b) N = smallest possible value

Find the maximum value (M)

To maximize the expression, the largest numbers should be used in multiplication.

Choose:

a) x = 5

b) y = 4

c) z = 3

Then, M = (5 × 4) + 3 = 20 + 3 = 23

Find the minimum value (N)

To minimize the expression, the smallest numbers should be used in multiplication.

Choose:

a) x = 2

b) y = 3

c) z = 4

Then, N = (2 × 3) + 4 = 6 + 4 = 10

Calculate M − N

M − N = 23 − 10 = 13

Therefore, Option c is the correct answer.

Q.10) Suppose x, y and z are variables taking positive real numbers as their possible values. It is given that y is directly proportional to x^2 and x is inversely proportional to z. For z = 7/25, the values of x and y are 5 and 50, respectively. If y = 98, what is z equal to?
a) 1/7
b) 1/5
c) 5/7
d) 1

Ans) b
Exp) Option b is the correct answer.
Given:

a) y is directly proportional to x^2

b) x is inversely proportional to z

c) When z = 7/25:

   a. x = 5

   b. y = 50

To Find: Value of z when y = 98

Form the equations

Since y is directly proportional to x^2, $y = k_1x^2$ where k_1 is a constant.

Since x is inversely proportional to z, $x = k_2/z$ where k_2 is another constant.

Find the constants

Using y = 50 and x = 5: $50 = k_1(5^2)$

$50 = 25k_1$

$k_1 = 2$

Therefore, $y = 2x^2$

Using $x = 5$ and $z = 7/25$:

$5 = k_2/(7/25)$

$5 = 25k_2/7$

$k_2 = 7/5$

Therefore, $x = 7/(5z)$

Find x when y = 98

Using:

$y = 2x^2$

$98 = 2x^2$

$x^2 = 49$

$x = 7$

Find z

Using:

$x = 7/(5z)$

$7 = 7/(5z)$

$5z = 1$

$z = 1/5$

Therefore, Option b is the correct answer.

Directions for the next 2 (two) items:
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

India is starting to deploy AI for critical use cases such as weather forecasting, pest detection and control, and crop yield optimisation. However, penetration is limited to a small subset of tech-savvy farmers. In the US and in Europe, generative AI tools have started offering precision farming at scale, integrating large datasets to provide real-time agronomic insights. For at-scale integration and accessibility of AI tools in India, it would be helpful to develop Indian languages-based AI tools for

smallholder farmers, partner with AgTechs to create affordable AI solutions, and disseminate AI-based advisory services through government programmes.

Q.11) Which of the following assumptions is/are valid?

1. Agricultural productivity has marched ahead in the West because of the economies of scale facilitated by the adoption of AI tools.
2. Affordable AI tools rendered available in local languages can help AI-based solutions reach more and more small farmers.
3. Though penetration is as yet low, critical application areas deploying AI tools are already in use in India.

Select the answer using the code given below.

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

Ans) d

Exp) Option d is the correct answer.

Statement 1 is invalid. The passage states that "**In the U.S. and in Europe, generative AI tools have started offering precision farming at scale, integrating large datasets to provide real-time agronomic insights**." However, it **does not mention that this trend has led to greater productivity.**

Statement 2 is valid. The passage explicitly states "**For at-scale integration and accessibility of AI tools in India, it would be helpful to develop Indian languages-based AI tools for smallholder farmers, partner with AgTechs to create affordable AI solutions, and disseminate AI-based advisory services through government programs.**"

Statement 3 is valid. The passage notes that "**India is starting to deploy AI for critical use cases such as weather forecasting, pest detection and control, and crop yield optimization. However, penetration is limited to a small subset of tech-savvy farmers.**"

Q.12) Which of the following statements is/are ***not*** correct?

1. Tech-savvy farmers will drive the AgTech companies of the future.
2. The development of advisory services by the government programmes for the use of AI tools in agriculture would be helpful.
3. In the US and Europe, AI tools have replaced traditional agricultural practices.
4. The integration of large datasets for use in real-time agronomic analysis is already a reality.

Select the answer using the code given below.

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

Ans) a

Exp) Option a is the correct answer.

Statement 1 is incorrect. While the passage states that the penetration of AI in the agricultural sector in India is limited to a small subset of tech-savvy farmers, it **does not mention that these farmers would drive the AgTech companies of the future. Therefore, the statement is incorrect.**
Statement 2 is correct. The passage notes that "**it would be helpful to develop Indian languages-based AI tools for smallholder farmers, partner with AgTechs to create affordable AI solutions, and disseminate AI-based advisory services through government programs**". Therefore, statement 2 is correct.
Statement 3 is incorrect. Though the passage highlights the large-scale use of AI in the agricultural sector in the US and Europe, it **does not mention that AI tools have replaced traditional farming.** The statement is therefore an exaggeration and therefore incorrect.
Statement 4 is correct. The passage states that "**In the US and in Europe, generative AI tools have started offering precision farming at scale, integrating large datasets to provide real-time agronomic insights**." Therefore, statement 4 is correct.

Q.13) P, Q, R, S and T are ranked 1 to 5 (not necessarily in that order). The rank of P is 4, the rank of Q is not 5, the rank of R is 1, the rank of S is not 2, the rank of T is not 3. Then which of the following is/are correct?
I. If the rank of S is 3, then that of T is 2.
II. If the rank of Q is 3, then that of T is 5.
Select the answer using the code given below.
a) I only
b) II only
c) Both I and II
d) Neither I nor II

Ans) d
Exp) Option d is the correct answer.

Given:

a) P = 4

b) R = 1

c) Q ≠ 5

d) S ≠ 2

e) T ≠ 3

Fill the fixed ranks

Rank	Person
1	R
4	P

Remaining ranks: 2, 3, 5

Remaining persons: Q, S, T

Check Statement I

Statement I: If S = 3, then T = 2.

If S gets rank 3, remaining ranks are 2 and 5 for Q and T. Since Q ≠ 5, Q must be 2.

Therefore, T must be 5. So, T ≠ 2.

Hence, Statement I is false.

Check Statement II

Statement II:

If Q = 3, then T = 5. If Q gets rank 3, remaining ranks are 2 and 5 for S and T.

Since S ≠ 2, S must be 5. Therefore, T must be 2. So, T ≠ 5.

Hence, Statement II is false.

Conclusion

Both Statement I and Statement II are false.

Therefore, Option d is the correct answer.

Q.14) Two identical straight rods are painted in five distinct colours so that each of them gets divided into five equal parts along the length. In one of them, the portions are marked P1, P2, P3, P4 and P5 (not necessarily in that order) whereas in the other, they are marked Q1, Q2, Q3, Q4 and Q5 (not necessarily in that order). When the rods are kept parallel to each other side by side, P1 and Q3 match, P4 matches Q1 or Q2, and Q4 matches P3 or P5. If Q3 and Q5 are adjacent, which of the following is/are possible?
I. Q3 is marked at the middle portion of the straight rod.
II. P2 is marked at one of the extreme portions of the straight rod.
Select the answer using the code given below.
a) I only
b) II only

c) Both I and II
d) Neither I nor II

Ans) c
Exp) Option c is the correct answer
Let the five aligned positions of the rods be: 1, 2, 3, 4, 5
Given:
P1 matches Q3, which means both occupy the same position.
P4 matches Q1 or Q2
Q4 matches P3 or P5
Q3 and Q5 are adjacent
Check Statement I possibility:
Try placing Q3 in the middle position (position 3).
Then Q5 can be at position 2 or 4.
Arrangement may look like:

Position	1	2	3	4	5
P	P4	P2	P1	P3	P5
Q	Q1	Q5	Q3	Q4	Q2

Now check from the conditions given:
P1 matches Q3: yes (both at 3)
P4 matches Q1 or Q2: yes (P4 with Q1)
Q4 matches P3 or P5: yes (Q4 with P3)
Q3 and Q5 adjacent: yes (positions 3 and 2)
Thus, Statement I is possible.

Check Statement II possibility:
Arrangement may look like:

Position	1	2	3	4	5
P	P2	P1	P4	P5	P3
Q	Q5	Q3	Q1	Q2	Q4

Now check from the conditions given:
P1 matches Q3: yes (both at 3)
P4 matches Q1 or Q2: yes (P4 with Q1)
Q4 matches P3 or P5: yes (Q4 with P3)
Q3 and Q5 adjacent: yes (positions 3 and 2)
Thus, Statement II is possible.

Q.15) Seven persons A, B, C, D, E, F and G travel by three cars X, Y, Z. A and another two of them travel by X. Only E travels with G. C travels by Z, but B does not travel by Y. Besides, A and B do not travel by the same car. Then which of the following are correct?
I. No one travels alone.
II. Only D travels with F.
III. Only C travels with B.
Select the answer using the code given below.
a) I and II only
b) I and III only
c) II and III only
d) All the three

Ans) b
Exp) Option b is the correct answer.

Given:

a) A travels in car X with two others.

b) Only E travels with G.

c) C travels by Z.

d) B does not travel by Y.

e) A and B do not travel by the same car.

Analyze Car X

"A and another two of them travel by X" means: Car X has exactly 3 persons.

So: X = {A, _, _}

Analyze E and G

"Only E travels with G" means: E and G are together alone in one car.

Thus, one car has exactly: {E, G}

So this car has only 2 passengers.

Determine distribution of passengers

Total persons = 7

a) Car X has 3 persons

b) One car has E and G only → 2 persons

Remaining persons: 7 − 3 − 2 = 2

Thus, the three cars must contain: 3, 2, and 2 persons.

Place B and C

C travels by Z.

B:

a) does not travel by Y

b) cannot travel with A in X

Therefore, B must travel by Z.

Hence: Z = {B, C}

Since Z already has 2 persons, it is full.

Place E and G

E and G cannot be in Z because B and C are already there.

Therefore: Y = {E, G}

Y is also full.

Fill remaining positions

Assigned persons:

a) X → A

b) Y → E, G

c) Z → B, C

Remaining persons: D and F

The only available places are in X.

Therefore: X = {A, D, F}

Final Arrangement

Car	Passengers
X	A, D, F
Y	E, G
Z	B, C

Check the Statements

Statement I: No one travels alone

All cars have either 2 or 3 persons.

Hence, Statement I is true.

Statement II: Only D travels with F

F travels with both A and D in Car X.

Hence, Statement II is false.

Statement III: Only C travels with B

Car Z contains only B and C.

Hence, Statement III is true.

Conclusion

Statements I and III are correct.

Therefore, Option b is the correct answer.

Q.16) There are four statements X, Y, Z and W. Their relations are as follows:
If X is incorrect, then so is Z; if Y is incorrect, then W is correct; if W is correct, then X is incorrect.
Which of the following is/are correct?
I. If X is correct, then so is Y.
II. If Z is correct, then it is not necessary that Y is correct.
Select the answer using the code given below.
a) I only
b) II only
c) Both I and II
d) Neither I nor II

Ans) a
Exp) Option a is the correct answer.

Given:

a) If X is incorrect, then Z is incorrect.

b) If Y is incorrect, then W is correct.

c) If W is correct, then X is incorrect.

Analyze Statement I

Statement I:

If X is correct, then Y is correct.

From the given conditions:

Y incorrect ⇒ W correct
W correct ⇒ X incorrect

Therefore: Y incorrect ⇒ X incorrect

Taking the contrapositive: X correct ⇒ Y correct

Hence, Statement I is true.

Analyze Statement II

Statement II:

If Z is correct, then it is not necessary that Y is correct.

From the first condition: X incorrect ⇒ Z incorrect

Contrapositive: Z correct ⇒ X correct

From Statement I: X correct ⇒ Y correct

Therefore: Z correct ⇒ Y correct

So Y must be correct.

Thus, the statement "it is not necessary that Y is correct" is false.

Hence, Statement II is false.

Conclusion

a) Statement I is true.

b) Statement II is false.

Therefore, Option a is the correct answer.

Q.17) X and Y are two runners who run for the same duration of time on the same circular track. They started running at the same time in the same direction with uniform speeds. When X completed 7 rounds, Y did exactly 5. After completing 5 rounds, Y changed his direction and started running in the opposite direction with speed which is double of his earlier speed. On the other hand, X continued to run with the same speed. They stopped running when X completed exactly 21 rounds. How many times did X and Y meet after they had started and before they finally stopped?
a) 35
b) 34
c) 31
d) 29

Ans) a
Exp) Option a is the correct answer.

Given:

X and Y start together on a circular track.

Initially, they run in the same direction.

When X completes 7 rounds, Y completes 5 rounds.

Therefore, their initial speed ratio is: X : Y = 7 : 5

Let:

Speed of X = 7k

Initial speed of Y = 5k

After Y completes 5 rounds:

Y reverses direction.

Y's new speed becomes double.

So, new speed of Y = 10k.

X continues with speed 7k.

They stop when X completes 21 rounds.

Meetings before Y changes direction

Initially both move in the same direction.

Number of meetings on a circular track when moving in the same direction = Difference in rounds completed

When X completes 7 rounds and Y completes 5 rounds: Meetings = 7 − 5 = 2

So, before direction change, they meet 2 times.

Meetings after Y changes direction

At this point:

X has completed 7 rounds.

Y has completed 5 rounds.

Now Y runs in the opposite direction with speed 10k.

X continues with speed 7k.

Distance covered by X after direction change

X finally stops at 21 rounds.

So additional rounds covered by X: 21 − 7 = 14 rounds

Distance covered by Y after direction change

Since time is same for both runners: Distance ratio = Speed ratio

So, Y : X = 10 : 7

Therefore, while X covers 14 rounds, Y covers: (10/7) × 14 = 20 rounds

Count meetings in opposite direction

When runners move in opposite directions on a circular track:

Number of meetings = Sum of rounds covered

Therefore: Meetings = 14 + 20 = 34

So, after direction change, they meet 34 times.

Total meetings

Total meetings = 2 + 34 = 36

However, at the exact final instant:

1. X finishes 21 rounds
2. Y finishes 25 rounds

Both are simultaneously at the starting point when they stop.

The question asks for meetings **before they finally stopped**, so this last meeting is excluded.

Hence, Total meetings = 36 − 1 = 35

Therefore, Option a is the correct answer.

Q.18) In an objective type question paper, 5 marks are awarded for a correct answer and 2 marks are deducted for a wrong answer. A student attempted all the questions and got a score of 69. Had he been awarded 4 marks for a correct answer and 1 mark deducted for a wrong answer, he would have scored 84. How many questions were there in the question paper?
a) 99
b) 81
c) 84
d) 79

Ans) b
Exp) Option b is the correct answer.

Given:

1. 5 marks for each correct answer
2. 2 marks deducted for each wrong answer
3. Total score = 69

In another scheme:

1. 4 marks for each correct answer
2. 1 mark deducted for each wrong answer
3. Total score = 84

Let:

- Number of correct answers = x
- Number of wrong answers = y

Since all questions were attempted:

Total questions = x + y

Form the equations

From the first marking scheme: $5x - 2y = 69$ .....(1)

From the second marking scheme: $4x - y = 84$ .....(2)

Solve the equations

Multiply equation (2) by 2: $8x - 2y = 168$ .....(3)

Subtract equation (1) from equation (3): $(8x - 2y) - (5x - 2y) = 168 - 69$

$3x = 99$

$x = 33$

Find y

Substitute x = 33 into equation (2):

$4(33) - y = 84$

$132 - y = 84$

$y = 48$

Find total number of questions

Total questions = x + y = 33 + 48 = 81

Therefore, Option b is the correct answer.

Directions for the next 2 (two) items:
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

The Juvenile Justice (Care and Protection of Children) Act, or the JJ Act, 2015 allows for the possibility for trying adolescents above 16 as adults if they are accused of committing a heinous offence. A heinous offence is one with a minimum punishment of seven years. Offences such as culpable homicide and causing death by negligence, which are common in drunken driving cases, are not heinous offences because they do not have a prescribed minimum punishment. The JJ Act, amended in 2021, now categorises an offence that has no minimum sentence, but has a maximum sentence of seven years or more as a serious offence which nonetheless, in the opinion of activists, does not merit the transfer of a case to the adult criminal justice system.

Q.19) Which of the following conclusions is/are valid?
1. Only a serious offence as categorised by the revised JJ Act, justifies the transfer of a case to the adult judicial system.
2. The JJ Act, 2021, categorises an offence as a serious offence based on the maximum sentence it carries, rather than on the minimum sentence.
Select the answer using the code given below.
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Ans) b
Exp) Option b is the correct answer
Statement 1 is incorrect. The passage explicitly states that "**The JJ Act, amended in 2021, now categorises an offence that has no minimum sentence, but has a maximum sentence of seven years or more as a serious offence which nonetheless, in the opinion of activists, does not merit the transfer of a case to the adult criminal justice system**." Therefore, statement 1 is incorrect.
Statement 2 is correct. The passage states "**The JJ Act, amended in 2021, now categorises an offence that has no minimum sentence, but has a maximum sentence of seven years or more as a serious offence**". Therefore, statement 1 is correct.

Q.20) Which of the following statements is/are correct?
1. If an offence has no minimum prescribed punishment, it cannot be considered heinous as per the JJ Act, 2015.

2. As per the JJ Act, 2021, an offence for which there is a provision for a maximum sentence of seven years or more, but no minimum sentence, is to be considered a serious offence.
Select the answer using the code given below.
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Ans) c
Exp) Option c is the correct answer.
Statement 1 is correct. The passage states that "The Juvenile Justice (Care and Protection of Children) Act, or the JJ Act, 2015 allows for the possibility for trying adolescents above 16 as adults if they are accused of committing a heinous offence. A heinous offence is one with a minimum punishment of seven years. **Offences such as culpable homicide and causing death by negligence, which are common in drunken driving cases, are not heinous offences because they do not have a prescribed minimum punishment.**" Therefore, statement 1 is correct.
Statement 2 is correct. The passage states that "**The JJ Act, amended in 2021, now categorises an offence that has no minimum sentence, but has a maximum sentence of seven years or more as a serious offence**". Therefore, statement 2 is correct.

Q.21) An explosion takes place at a certain distance from an army camp. As soon as the sensor in the camp receives the sound of the explosion, a drone starts flying towards the spot of explosion. The drone clicks a picture from the spot and the camp receives it at the same time. Immediately another drone starts flying to the spot and it also sends a picture as soon as it reaches the spot. The two pictures were received at 5:02 PM and 5:05 PM, respectively. If the speed of the drones is 30 m/s, at what time did the explosion take place? Assume that the speed of sound is 300 m/s.
a) 4:59:00 PM
b) 4:59:02 PM
c) 4:58:42 PM
d) 4:56:32 PM

Ans) c
Exp) Option c is the correct answer.

Given:

- Speed of sound = 300 m/s
- Speed of each drone = 30 m/s
- First picture received at 5:02 PM
- Second picture received at 5:05 PM

Let:

- Distance between camp and explosion spot = D metres

- Time of explosion = T

Find the distance D

The second drone starts immediately after the first picture is received, i.e., at 5:02 PM. It reaches the explosion spot and sends the picture at 5:05 PM.

Thus, travel time of second drone: 5:05 – 5:02 = 3 minutes = 180 seconds

Using: Distance = Speed × Time

D = 30 × 180

D = 5400 metres

Find total time taken before first picture

For the first picture:

1. Sound travels from explosion spot to camp.
2. Then the first drone travels from camp to explosion spot.

Time taken by sound = 5400/300 = 18 seconds

Time taken by first drone = 5400/30 = 180 seconds = 3 minutes

Total time from explosion to first picture = 3 minutes + 18 seconds = 3 minutes 18 seconds

Find the explosion time

First picture was received at 5:02 PM.

Subtract 3 minutes 18 seconds: 5:02:00 PM − 3:18 = 4:58:42 PM

Therefore, Option c is the correct answer.

Q.22) The digit in the unit place of the number 6^{129} x 7^{307} is
a) 2
b) 4
c) 8
d) 6

Ans) c
Exp) Option c is the correct answer.

Given:

Number = $6^{129} \times 7^{307}$

We need to find the digit in the unit place.

Find the unit digit of 6^{129}

Powers of 6 always end in 6.

- $6^1 \rightarrow 6$
- $6^2 \rightarrow 36$
- $6^3 \rightarrow 216$

So, the unit digit of 6^{129} is **6**.

Find the unit digit of 7^{307}

Unit digits of powers of 7 follow a cycle of 4:

- $7^1 \rightarrow 7$
- $7^2 \rightarrow 9$
- $7^3 \rightarrow 3$
- $7^4 \rightarrow 1$

Now divide 307 by 4:

307 ÷ 4 leaves remainder 3.

So, 7^{307} has the same unit digit as 7^3, which is **3**.

Multiply the unit digits

6 × 3 = 18

Therefore, the unit digit is **8**.

Therefore, Option c is the correct answer.

Q.23) A person saves 10% of his salary every month. If his salary increases by 12% and the expenditure increases by 10%, then what will be the change in his saving per month?
a) 20% increase
b) 30% increase
c) 03% decrease
d) 02% decrease

Ans) b
Exp) Option b is the correct answer.

Given:

- Savings = 10% of salary
- Salary increases by 12%

- Expenditure increases by 10%

Let the initial salary be 100.

Then:

- Initial savings = 10% of 100 = 10
- Initial expenditure = 100 − 10 = 90

Calculate new salary

New salary = 100 + 12% of 100 = 100 + 12 = 112

Calculate new expenditure

New expenditure = 90 + 10% of 90 = 90 + 9 = 99

Calculate new savings

New savings = New salary − New expenditure = 112 − 99 = 13

Find percentage change in savings

Increase in savings = 13 − 10 = 3

Percentage increase = (3/10) × 100 = 30%

Therefore, Option b is the correct answer.

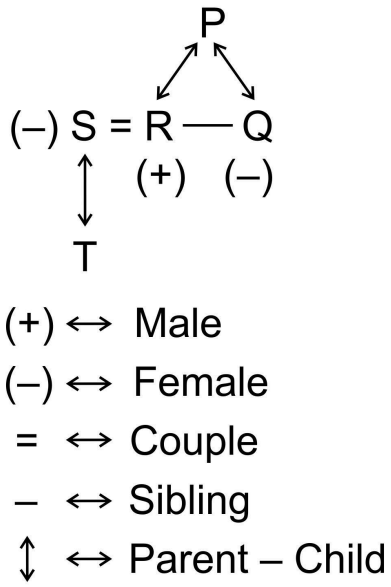
Q.24) P has a son and a daughter. S is the mother of T. S is R's spouse. Q and R are children of P. Then how is Q related to S?
a) Q is a sister of S
b) Q is a daughter of S
c) Q is the mother of S
d) Q is a sister of the husband of S

Ans) d
Exp) Option d is the correct answer

Given:

- P has one son and one daughter.
- Q and R are children of P.
- S is R's spouse.
- S is the mother of T.

After analyzing the case let we get the following family tree



Determine the gender of R

Since S is R's spouse and S is female (mother of T), R must be male.

Therefore, R is the son of P.

Determine the gender of Q

P has only one son and one daughter.

Since R is the son, Q must be the daughter.

Hence, Q is the sister of R.

Find Q's relation to S

R is the husband of S.

Q is the sister of R.

Therefore, Q is the sister of the husband of S.

Therefore, Option d is the correct answer.

Q.25) How many three-digit numbers can be expressed as an integral power of 2?
a) 1
b) 2

c) 3
d) 4

Ans) c
Exp) Option c is the correct answer.

Given:

We need to find all powers of 2 that are three-digit numbers.

A three-digit number lies between 100 and 999.

Write powers of 2

- $2^5 = 32$
- $2^6 = 64$
- $2^7 = 128$
- $2^8 = 256$
- $2^9 = 512$
- $2^{10} = 1024$

Identify three-digit numbers

The three-digit powers of 2 are:

- 128
- 256
- 512

Total = 3 numbers

Therefore, Option c is the correct answer.

Directions for the next 2 (two) items :
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

The key source of the battle for clean skies and clear lungs is the fuel we burn—from household Chulhas to the thermal power plants. In most cases, it is biomass or coal. The Supreme Court banned the use of pet coke—the dirtiest of such fuels. The Delhi Government banned the use of coal, which was later extended to the entire National Capital Region. It was also agreed that the thermal power plants would clean up or shut down. Action on this has been patchy to say the least. The lesson from the transition to CNG is that people need alternatives for a ban to be effective. When

diesel buses were stopped, CNG supply had to be assured. It also had to be feasible in terms of cost. The Supreme Court agreed that fiscal measures were needed to keep clean fuel cheaper than dirty fuel. Now even as coal is banned, the price of natural gas makes industry uncompetitive.

Q.26) Which of the following inferences is/are correct?
1. The source of the energy we consume is the key to the battle for cleaner air.
2. Bans are effective where the will is strong and the people are convinced that such bans are for the greater good of society.
3. There is judicial approval for a policy that intervenes fiscally to facilitate benevolent pricing for cleaner fuel.
Select the answer using the code given below.
a) 1 and 2
b) 2 and 3
c) 1 and 3
d) 1 only

Ans) c
Exp) Option c is the correct answer.
Statement 1 is correct. The passage states "**The key source of the battle for clear skies and clear lungs is the fuel we burn-from household chulas to the thermal power plants**." From here we can conclude that the source of the energy we consume is the key to the battle for cleaner air.
Statement 2 is incorrect. The passage explicitly mentions that "**The lesson from the transition to CNG is that people need alternatives for a ban to be effective**." Therefore, it does not state that the effectiveness of bans is dependent on the conviction of people.
Statement 3 is correct. The passage mentions that "**The Supreme Court agreed that fiscal measures were needed to keep clean fuel cheaper than dirty fuel**." Therefore, statement 3 is correct.

Q.27) Which of the following statements is/are correct?
1. Thermal power stations in Delhi were required to summarily shut down.
2. CNG supplies had to be assured once diesel vehicles were prohibited from plying.
3. The Supreme Court banned the use of coal across the National Capital Region.
Select the answer using the code given below.
a) 1 and 2
b) 3 only
c) 2 only
d) 2 and 3

Ans) c
Exp) Option c is the correct answer.
Statement 1 is incorrect. The passage states that "**the thermal power plants would clean up or shut down.**" Therefore, they were not required to summarily shut down.
Statement 2 is correct. The passage explicitly states that "**When diesel buses were stopped, CNG supply had to be assured**." Therefore, statement 2 is correct.

Statement 3 is incorrect. The passage states that **the Delhi Government banned the use of coal and not the Supreme Court.** t Therefore, statement 3 is incorrect.

Q.28) Consider the following statements:
Every red is blue. Every blue is green. Every green is yellow.
Which of the following statements denoted by P, Q and R are correct?
P. Every blue is yellow.
Q. Every red is green.
R. Every red is yellow.
Select the answer using the code given below.
a) P and Q only
b) Q and R only
c) P and R only
d) P, Q and R

Ans) d
Exp) Option d is the correct answer.

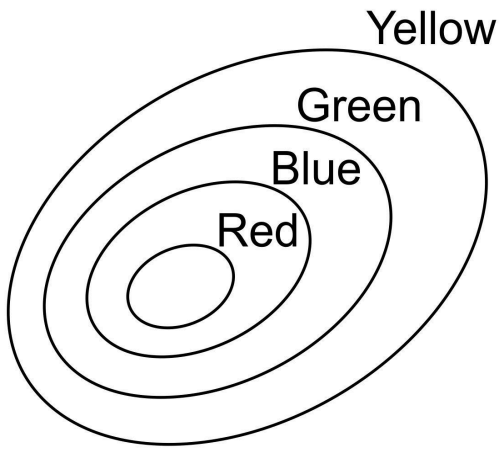
Given:

- Every red is blue
- Every blue is green
- Every green is yellow

Thus, the relation becomes:

Red ⊂ Blue ⊂ Green ⊂ Yellow

After interpreting the instructions we get the following venn diagram



Checking Statement P

Every blue is yellow.

Since every blue is green and every green is yellow, every blue must also be yellow.

Hence, **P is correct**.

Checking Statement Q

Every red is green.

Since every red is blue and every blue is green, every red must also be green.

Hence, **Q is correct**.

Checking Statement R

Every red is yellow.

Since red is contained inside blue, green, and finally yellow, every red must also be yellow.

Hence, **R is correct**.

Therefore, Option d is the correct answer.

Q.29) How many times does 5 appear in all two-digit positive integers?
a) 18
b) 19
c) 20
d) 21

Ans) b
Exp) Option b is the correct answer.

Given:

We need to count how many times the digit 5 appears in all two-digit numbers from 10 to 99.

Count occurrences in the units place

Numbers ending in 5 are: 15, 25, 35, 45, 55, 65, 75, 85, 95

Total occurrences = 9

Count occurrences in the tens place

Numbers from 50 to 59 have 5 in the tens place: 50, 51, 52, 53, 54, 55, 56, 57, 58, 59

Total occurrences = 10

Find total occurrences

Total number of times 5 appears = 9 + 10 = 19

(Note: In 55, the digit 5 appears twice, and both are counted.)

Therefore, Option b is the correct answer.

Q.30) X travels 6 km on a bicycle with average speeds of 5 km per hour, 10 km per hour and 4 km per hour during the first 1 km, the next 2 km and the remaining 3 km, respectively. Y travels the same distances with average speeds of 4 km per hour, 10 km per hour and 5 km per hour, respectively. How many minutes early will Y complete the journey if both X and Y start at the same time?
a) 3
b) 4
c) 5
d) 6

Ans) d
Exp) Option d is the correct answer.

Given

For both X and Y:

- First distance = 1 km
- Second distance = 2 km
- Third distance = 3 km

Use: Time = Distance / Speed

Time taken by X

First 1 km at 5 km/h

Time = 1/5 hour = (1/5) × 60 = 12 minutes

Next 2 km at 10 km/h

Time = 2/10 hour = 1/5 hour = 12 minutes

Remaining 3 km at 4 km/h

Time = 3/4 hour = (3/4) × 60 = 45 minutes

Total time taken by X = 12 + 12 + 45 = 69 minutes

Time taken by Y

First 1 km at 4 km/h

Time = 1/4 hour = (1/4) × 60 = 15 minutes

Next 2 km at 10 km/h

Time = 2/10 hour = 1/5 hour = 12 minutes

Remaining 3 km at 5 km/h

Time = 3/5 hour = (3/5) × 60 = 36 minutes

Total time taken by Y = 15 + 12 + 36 = 63 minutes

Difference in time

Time difference = 69 − 63 = 6 minutes

Conclusion

Y completes the journey 6 minutes earlier than X.

Therefore, Option d is the correct answer.

Q.31) Seven cubes are identical in shape. Out of these, the weight of each of the six cubes is equal and the weight of the remaining cube is less than the weight of any other cube. A balance is used to identify the lightest cube. What is the minimum number of attempts required to distinguish the odd cube with certainty?
a) 2
b) 3
c) 4
d) 1

Ans) a
Exp) Option a is the correct answer

Given

- Total cubes = 7
- 6 cubes have equal weight
- 1 cube is lighter than all others
- A balance is used to identify the lighter cube

We must find the minimum number of attempts required to identify the lighter cube with certainty.

First Weighing

Divide the cubes into groups of:

- 3 cubes on the left pan
- 3 cubes on the right pan
- 1 cube kept aside

Now compare the two groups of 3 cubes.

Case 1: The balance is equal

This means all 6 cubes on the balance have equal weight.

Therefore, the cube kept aside is the lighter cube.

So, the odd cube is identified in 1 attempt.

Case 2: The balance tilts

The lighter cube must be among the 3 cubes on the lighter side.

Now only 3 cubes are suspected.

Second Weighing

Take the 3 suspected cubes.

- Place 1 cube on each side of the balance
- Keep 1 cube aside

If the balance is equal

The cube kept aside is the lighter cube.

If the balance tilts

The cube on the lighter side is the odd cube.

Thus, the lighter cube is identified with certainty.

Conclusion

The maximum number of attempts required is 2.

Therefore, Option a is the correct answer.

Directions for the next 2 (two) items:
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

Previous waves of customer-service technology, including email and those pesky voice menus, stoked concerns of job losses, only for them to fail to materialise. Al could yet prove different. And if it does, its effects may be salutary. Human agents could be freed up to spend more time on creative and rewarding tasks, like using feedback to make products and services better and thereby spend less time listening to irate customers!

Q.32) Which one among the following statements most appropriately reflects the point of view of the given passage?
a) If Al were to take over customer service, there would be no work left for human subjects to do.
b) Irritating voice menus and email not achieve human could redundancy to the extent that Al might.
c) The value of human intervention in the workplace affected by Al might be enhanced through redirection towards more fulfilling tasks.
d) Unlike previous waves in customer-service technology, AI has raised the alarm of worker replacement.

Ans) c
Exp) Option c is the correct answer.
It highlights that the effect of the use of AI in the workplace may be salutary. It is explicitly mentioned in the passage as "**Human agents would be freed up to spend more time on creative and rewarding tasks, like using feedback to make products and services better**".

Q.33) Which of the following conclusions, made on the basis of the given passage, is/are correct?
1. The advent of new customer-service technology had invariably sparked fears about job losses.
2. Often it is found that instead of job losses, alternative channels for employee engagement are discovered while certain tasks are replaced by technology.
3. The advent of technology inevitably leads to stressful outcomes.
Select the answer using the code given below.
a) 1 and 3
b) 2 only
c) 3 only
d) 1 and 2

Ans) d
Exp) Option d is the correct answer.
Statement 1 is correct. The passage states that "**Previous waves of customer-service technology, including emails and those pesky voice menus, stoked concerns of job loss**." Though the use of the word invariably may make it sound extreme, the passage treats the past waves of customer-service technology as a uniform trend, justifying its use.
Statement 2 is correct. The passage states that with the use of AI in customer service "**Human agents would be freed up to spend more time on creative and rewarding tasks, like using feedback to make products and services better- and thereby spend less time listening to irate customers**".
Therefore, it can be concluded that instead of job losses, alternative channels for employee engagement are discovered with the use of new technology.

Statement 3 is incorrect. This statement is in contrast to statement 2. It does not take into account the opening up of new channels for employee engagement with the advent of new technology and **solely focuses on the negative impacts of the use of technology at the workplace**. Therefore, it is incorrect.

Directions for the next 2 (two) items:
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

Cattle from the nearby villages came to the common ground to graze, and there was still a cool freshness in the air. Hori took several deep breaths and thought of sitting down for a while, since he'd be dying of heat in the scorching 'loo' wind the rest of the day. A number of farmers were eager to lease this bit of land and had offered a good price, but Rai Sahib God bless him-had plainly told them it was reserved for grazing and would not be relinquished for any price. If he'd been one of those selfish Zamindars, he'd have said the cattle could go to hell, that there was no reason for him to miss the chance to make a little money. But the Rai Sahib still held to the old values, feeling that any landlord who didn't look after his tenants was less than human.

Q.34) Which of the following conclusions is/are correct?
1. All landlords essentially have some goodness trapped within them.
2. The common grazing grounds of a village are intended for use by the cattle of that village.
3. Landlords who believe in tradition tend to be more concerned about their tenants.
4. Winds later in the day tend to be cooler post the hot winds of the morning.
Select the answer using the code given below.
a) 1 and 3
b) 2 and 4
c) 3 only
d) 2 only

Ans) c
Exp) Option c is the correct answer.
Statement 1 is incorrect. The passage mentions that unlike Rai Sahib, **some zamindars were selfish**. Therefore, we **cannot conclude that all landlords have some goodness.**
Statement 2 is incorrect. While the passage states that cattle from nearby villages came to the common ground to graze as Rai Sahib had said that that bit of land was reserved for grazing. **We cannot definitely conclude that all common grounds of a village were intended for use by the cattle.**
Statement 3 is correct. The passage mentions that "**Rai Saheb still held to the old values, feeling that any landlord who didn't look after his tenants was less than human**." From here, we can conclude that statement 3 is correct.

Statement 4 is incorrect. The statement is in contrast to the passage which states that **there is cool air in the morning followed by scorching loo the rest of the day.**

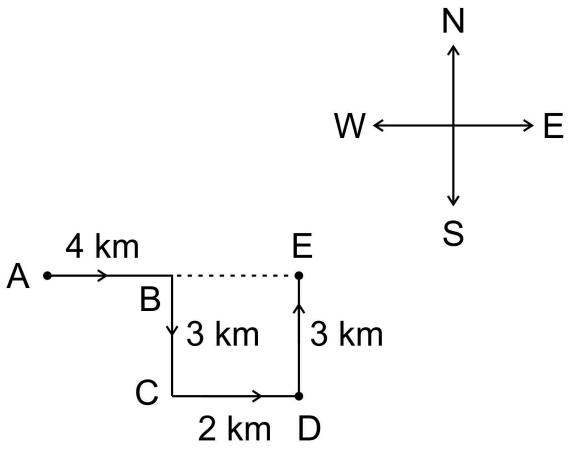
Q.35) Which of the following statements are **not** correct?
1. The landholdings of Rai Sahib were currently not being used for farming.
2. Temperamentally, Rai Sahib was as greedy as other landlords.
3. It cannot be ascertained that Rai Sahib could have made some money by leasing out the grazing land.
4. It may be asserted that Rai Sahib valued his tenants and wanted to protect their livelihood.
Select the answer using the code given below.
a) 1 and 2 only
b) 1 and 3 only
c) 3 and 4
d) 1, 2 and 3

Ans) d
Exp) Option d is the correct answer.
Statement 1 is incorrect. The passage states that a **bit of Rai Sahib's land was being used for grazing**. We **cannot conclude whether the other parts were being utilized for farming or not.**
Statement 2 is incorrect. The **passage explicitly highlights that Rai Sahib was unlike other selfish zamindars.** Therefore, statement 2 is incorrect.
Statement 3 is incorrect. The passage states that "**A number of farmers were eager to lease this bit (the bit for grazing) of land and had offered a good price. If he'd been one of those selfish Zamindars, he'd have said the cattle could go to hell, that there was no reason for him to miss the chance to make a little money**." From here, we can conclude that statement 3 is in contrast to the passage and thus incorrect.
Statement 4 is correct. The passage states that "**Rai Saheb still held to the old values, feeling that any landlord who didn't look after his tenants was less than human.**" Therefore, statement 4 is correct.

Q.36) A person facing the East travels 4 km straight and then turns right and travels 3 km, then further turns left and travels 2 km and finally turns left and travels 3 km. The minimum distance between the final point and the initial point, and the direction in which the person is facing at the final point are, respectively
a) 12 km, East
b) 6 km, East
c) 8 km, North
d) 6 km, North

Ans) d
Exp) Option d is the correct answer

After analyzing the case let we get the following diagram:



We can see that the minimum distance between point A and E is 4+2=6km and at E the person is facing North direction.

Therefore, Option d is the correct answer.

Q.37) In a sequence of numbers, each number other than the first two is the sum of the two immediately preceding numbers from it. If the first two numbers in the sequence are 4 and 7, then the sixth number is

a) 29
b) 37
c) 43
d) 47

Ans) d
Exp) Option d is the correct answer.

Given

- First number = 4
- Second number = 7
- Each number after that is the sum of the previous two numbers.

So,

3rd term = 1st term + 2nd term
4th term = 2nd term + 3rd term, and so on.

Form the sequence

1st term = 4

2nd term = 7

3rd term = 4 + 7 = 11

4th term = 7 + 11 = 18

5th term = 11 + 18 = 29

6th term = 18 + 29 = 47

Conclusion

The sixth number of the sequence is 47.

Therefore, Option d is the correct answer.

Q.38) The ratio of male to female workers in two companies A and B is 13:10 and 7:5, respectively. If both the companies have the same number of female workers, then what is the ratio of the total number of workers in A to those in B?
a) 24 : 23
b) 23 : 24
c) 18 : 17
d) 27 : 18

Ans) b
Exp) Option b is the correct answer.

Given

- In Company A, male : female = 13 : 10
- In Company B, male : female = 7 : 5
- Number of female workers in both companies is the same.

We need to find: Total workers in A : Total workers in B

Equalize the female workers

Female ratio parts are:

- Company A = 10
- Company B = 5

LCM of 10 and 5 = 10

So, Company B ratio is multiplied by 2: 7 : 5 = 14 : 10

Now the ratios become:

- Company A = 13 : 10
- Company B = 14 : 10

Find total workers

Company A

Total workers = 13 + 10 = 23

Company B

Total workers = 14 + 10 = 24

Required ratio

Total workers in A : Total workers in B = 23 : 24

Conclusion

The required ratio is 23 : 24.

Therefore, Option b is the correct answer.

Q.39) If the product of the HCF and LCM of two distinct numbers is the cube of one of the numbers, then which of the following statements is/are correct?
I. The difference of the numbers is an even number.
II. One of the numbers is a perfect square.
Select the answer using the code given below.
a) I only
b) II only
c) Both I and II
d) Neither I nor II

Ans) c
Exp) Option c is the correct answer.

Given

For any two numbers a and b: HCF(a, b) × LCM(a, b) = a × b

The question states that this product is equal to the cube of one of the numbers.

Assume: $a \times b = a^3$

Dividing both sides by a: $b = a^2$

Thus, the two numbers are: a and a^2

Since the numbers are distinct, $a \neq 1$.

Checking Statement I

Difference of the numbers: $a^2 - a = a(a - 1)$

Here, a and (a − 1) are consecutive integers. Among two consecutive integers, one must be even.

Therefore, their product is always even.

So, the difference is always even.

Hence, Statement I is correct.

Checking Statement II

We already obtained: $b = a^2$

Therefore, one of the numbers is a perfect square.

Hence, Statement II is correct.

Conclusion

Both Statement I and Statement II are correct.

Therefore, Option c is the correct answer.

Q.40) If x and y are two digits and the number 4x5y790 is divisible by 11, then what is the remainder, if x+y is divided by 11?
a) 1
b) 3
c) 5
d) 7

Ans) d
Exp) Option d is the correct answer.

Given

Number = 4x5y790

The divisibility rule for 11 states:

A number is divisible by 11 if the difference between the sum of digits in alternate positions is either 0 or a multiple of 11.

Find the sums of alternate digits

Position 1 2 3 4 5 6 7

Digit 4 x 5 y 7 9 0

Sum of digits in odd positions = 4 + 5 + 7 + 0 = 16

Sum of digits in even positions = x + y + 9

Apply divisibility rule

Difference must be a multiple of 11.

So, (x + y + 9) − 16 = multiple of 11

x + y − 7 = multiple of 11

Therefore, x + y = 11k + 7 for some integer k.

Find the remainder when x + y is divided by 11

From x + y = 11k + 7 the remainder when x + y is divided by 11 is 7.

Conclusion

The required remainder is 7.

Therefore, Option d is the correct answer.

Directions for the next 2 (two) items:
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

Was it the sun-dappled ambience, the strawberries and cream, the frustration of Flavio Cobolli's unforced errors against Serbian Novak Djokovic on Centre Court or simply the crushing weight of being a 64-year-old man in the third act of a very public life? Whatever the reason, Hugh Grant, the actor, deserves empathy. There he was, in the Royal Box at Wimbledon, flanked by Britain's well-dressed and well-rested spectators, watching the men's singles quarterfinals, when the actor did something quietly radical head at a tilt, eyes closed, utterly unbothered, he took a nap. So praise be to Grant for serving up an unexpected ace. In that small, delicious moment, he didn't merely catch forty winks, he made an elegant case for surrender. Not to laziness, but to limits. To the body's quiet wisdom over society's relentless performance metrics. Wimbledon had its tennis. The perpetually sleep-deprived discovered a leading man, not of action, but of rest.

Q.41) Which of the following statements is/are correct?
1. Radical action can also be attributed to mild surrender where against societal one acts expectations.

2. Submitting to one's limitations, given the effect of age and other factors, ought not to be conflated with laziness.
3. 'Leading man' usually refers to one who plays the lead role in a movie; in this instance the implication is that Hugh Grarit is performing the role of not an action hero, but that of a resting one!
Select the answer using the code given below.
a) 1 and 2 only
b) 2 and 3 only
c) 1, 2 and 3
d) 3 only

Ans) c
Exp) Option c is the correct answer.
Statement 1 is correct. The passage states "There he (Hugh Grant) was, **in the Royal Box at Wimbledon, flanked by Britain's well-dressed and well-rested spectators**, watching the men's singles quarterfinals, when **the actor did something quietly radical** : head at a tilt, eyes closed, utterly unbothered, he took a nap. So praise be to Grant for serving up an unexpected ace. In that small, delicious moment, he didn't merely catch forty winks, he **made an elegant case for surrender**". Here the radical action of taking a nap at Wimbledon by Hugh Grant is being considered as mild surrender.
Statement 2 is correct. The passage states that by taking a nap at a Wimbledon match, Hugh Grants made an elegant case for surrender. Not to laziness, but to limits. To the body's quiet wisdom over society's relentless performance metrics.Therefore, statement 2 is correct.
Statement 3 is correct. The passage states "T**he perpetually sleep-deprived discovered a leading man, not of action, but of rest**." The passage has highlighted that Hugh Grants is an actor. Therefore, statement 3 compares the leading man in a movie to the role played by Hugh Grants in the match.

Q.42) Which of the following statements is/are correct?
1. Hugh Grant was watching, from the Royal Box, the men's semifinal match on Centre Court between Flavio Cobolli and Novak Djokovic.
2. The phrase 'unexpected ace' in the context uses a term from the game of tennis to highlight Hugh Grant's somewhat uncharacteristic act of catching 'forty winks'; an act that is viewed with opprobrium.
3. Grant subjects the demands of society to the wisdom of his body.
Select the answer using the code given below.
a) 1 and 2
b) 3 only
c) 2 and 3
d) 2 only

Ans) b
Exp) Option b is the correct answer.
Statement 1 is incorrect. The passage explicitly states that Hugh Grants was watching the men's **singles quarterfinals.** Therefore, statement 1 is incorrect.

Statement 2 is incorrect. The passage does not describe Hugh Grants act of taking a nap with opprobrium (or criticism). Rather the author states "**praise be to Grant for serving up an unexpected ace. In that small, delicious moment, he didn't merely catch forty winks, he made an elegant case for surrender.**"
Statement 3 is correct. The passage explicitly states that Grant surrendered "**To the body's quiet wisdom over society's relentless performance metrics**". Therefore, statement 3 is correct.

Directions for the next 2 (two) items:
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

The process by which countries close their labour-productivity gap with the technology leader is based on convergence theory. The convergence model divides economic eras into three phases the breakaway, the catch-up, and the fine-tuning phase. It also divides economic entities into two categories: the technology leaders and the technology followers. The process begins with the development of a new technology, such as scavenging three million years ago (MYA), hunting-one MYA, farming-12 thousand years ago, and industrial technology a little more than 200 years ago. During the breakaway phase, the per capita income of the technology leaders (e.g., Western Europe and North America in the industrial era) rises, but is unchanged for the technology followers. In the catch-up phase, the followers adopt the new technology and close their per capita income gap with the technology leaders. In the fine-tuning phase, where participants try to extract the remaining benefits from an increasingly exhausted technology, leaders and followers have similar per capita incomes.

Q.43) Which of the following conclusions are correct?
1. In the breakaway phase, economic progress is slow for the technology followers.
2. In the catch-up phase, leaders stagnate and followers, therefore, close the gap between them and the leaders.
3. In the fine-tuning technology is exhausted, as it were, phase, and both leaders and followers attempt to extract leftover benefits, leading to more or less similar per capita income levels.
4. Industrial technology followed scavenging. which preceded hunting, which itself was followed by farming.
Select the answer using the code given below.
a) 3 and 4 only
b) 1, 2, 3 and 4
c) 1 and 2 only
d) 2, 3 and 4 only

Ans) a
Exp) Option a is the correct answer.
Statement 1 is incorrect. The passage states that in the breakaway phase, **economic progress is unchanged for the technology followers**. Therefore, statement 1 is incorrect.

Statement 2 is incorrect. While the passage highlights that technology followers catch up with the leaders in the catch-up phase, it **does not explicitly state that the growth of the leaders stagnates**.
Statement 3 is correct. The passage states "**In the fine-tuning phase, where participants try to extract the remaining benefits from an increasingly exhausted technology, leaders and followers have similar per capita incomes.**"
Statement 4 is correct. While the order doesn't exactly match the one mentioned in the passage, the statement is correct as when we eliminate 1 as incorrect, statement 3 and statement 4 become correct.

Q.44) Which of the following statements is/are correct?
1. The convergence model divides nations into three phases of economic progress.
2. At the heart of the convergence theory is the closing of the gap between labour and productivity.
3. Technology leaders typically have arrived earlier at different economic eras.
4. The time period covered by the convergence theory presented herein encompasses, as mentioned, 4012200 years.
Select the answer using the code given below.
a) 2 and 4
b) 2 and 3
c) 3 only
d) 1, 3 and 4

Ans) c
Exp) Option c is the correct answer.
The passage provides a timeline of events where the maximum timeline can be three million years ago (MYA). Therefore, Statement 4 is incorrect which elimintaes option a and d.
Further, the passage states that "**The process by which countries close their labour-productivity gap with the technology leader is based on the convergence theory.**" This implies the labor-productivity gap between countries. On the other hand, statement 2 treats labour and productivity as separate entities. Therefore, it is incorrect. If we eliminate statement 2, we get to option c.
Statement 1 is incorrect. The passage explicitly states "**The convergence model divides economic eras into three phases: the breakaway, the catch-up, and the fine-tuning phase.**" But for leaders and followers there is little difference if we talk about the economic progress.
Statement 3 is correct. The passage discusses the creation of a **gap in labour-productivity as leader countries adopt a technology before follower countries.** Therefore, statement 3 is correct.

Q.45) An alloy P contains 20% copper and 80% zinc by weight. Another alloy Q contains 60% copper and 40% zinc by weight. A third alloy R is to be prepared from P and Q so that it contains equal amount of copper and zinc. In what ratio, amounts of P and Q be mixed in order to get R?
a) 1 : 3
b) 3 : 1
c) 2 : 3
d) 3 : 2

Ans) a
Exp) Option a is the correct answer.

Given

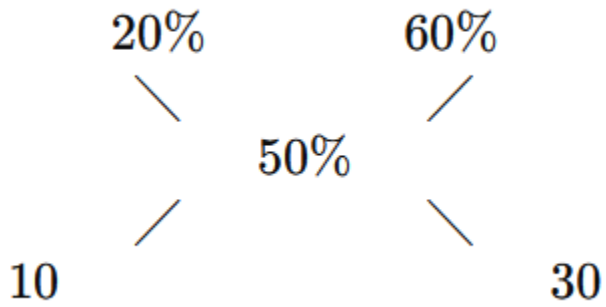
- Alloy P contains:
    - 20% copper
    - 80% zinc
- Alloy Q contains:
    - 60% copper
    - 40% zinc
- Alloy R contains equal amounts of copper and zinc.

Therefore, alloy R contains: 50% copper and 50% zinc.

Using the Rule of Alligation

We compare the copper percentages: P=20%, Q=60%, R=50%

Applying alligation:



Difference between Q and R: 60 − 50 = 10

Difference between R and P: 50 − 20 = 30

Therefore, P : Q = 10 : 30

Dividing both terms by 10: P : Q = 1 : 3

Conclusion

The required ratio in which alloys P and Q should be mixed is: 1 : 3

Therefore, Option a is the correct answer.

Q.46) A is a 2-digit number with different digits. B is also a 2-digit number and is obtained by reversing the digits of A. If A-B is a multiple of 27, where A > B, how many such different A's are possible?
a) 6
b) 9
c) 12
d) 18

Ans) b
Exp) Option b is the correct answer

Given

Let the 2-digit number A be:

$A = 10x + y$

where:

- x is the tens digit
- y is the units digit
- $x \neq y$

Since B is obtained by reversing the digits of A, $B = 10y + x$

Since B is also a 2-digit number, $y \neq 0$.

Also given: $A > B$

Therefore, $x > y$

Find A − B

$A - B = (10x + y) - (10y + x) = 9x - 9y = 9(x - y)$

Since A − B is a multiple of 27, $9(x - y) = 27k$ for some positive integer k.

Dividing both sides by 9, $x - y = 3k$

Find possible values of x − y

Since x and y are digits and $y \neq 0$, the maximum possible value of x − y is: 9 − 1 = 8

Therefore, the possible positive multiples of 3 not exceeding 8 are: x − y = 3 or 6

Count the possible values of A

Case 1: x − y = 3

Possible pairs are:

- (4,1) ⇒ A = 41
- (5,2) ⇒ A = 52
- (6,3) ⇒ A = 63
- (7,4) ⇒ A = 74
- (8,5) ⇒ A = 85
- (9,6) ⇒ A = 96

Total numbers = 6

Case 2: x − y = 6

Possible pairs are:

- (7,1) ⇒ A = 71
- (8,2) ⇒ A = 82
- (9,3) ⇒ A = 93

Total numbers = 3

Total count = 6 + 3 = 9

Conclusion

The number of possible values of A is 9

Therefore, Option b is the correct answer.

Q.47) If ZERO is encoded as ADSN, then how do you encode STOP?
a) SPOT
b) TSPO
c) TSOP
d) POST

Ans) b
Exp) Option b is the correct answer.

Given

ZERO is encoded as ADSN.

We need to find the code for STOP using the same pattern.

Solution

Identify the coding pattern

Compare the letters of ZERO and ADSN:

- Z → A : move forward by 1
- E → D : move backward by 1
- R → S : move forward by 1
- O → N : move backward by 1

Thus, the pattern is: +1, −1, +1, −1

Apply the same pattern to STOP

- S → T (+1)
- T → S (−1)
- O → P (+1)
- P → O (−1)

Therefore, STOP → TSPO

Therefore, Option b is the correct answer.

Q.48) There are three types of rectangular tiles: 3' x 3', 3'x 7' and 3' x 11'. An area of rectangular shape of dimensions 3'x 100' is to be covered using these tiles without breaking them, If x and y are the maximum and minimum numbers of tiles of various sizes, respectively, that can be used to cover the area exactly, then x - y is
a) 20
b) 12
c) 10
d) 7

Ans) a
Exp) Option a is the correct answer.

Given

The available tile sizes are:

- 3' × 3'
- 3' × 7'
- 3' × 11'

The floor size is: 3' × 100'

Since every tile has width 3', we only need to cover the length 100' using tile lengths 3, 7, and 11.

Let:

- a = number of 3' tiles
- b = number of 7' tiles
- c = number of 11' tiles

Then, 3a + 7b + 11c = 100

Total number of tiles used: N = a + b + c

We need to find:

- x = maximum possible number of tiles
- y = minimum possible number of tiles

Find the Maximum Number of Tiles (x)

To maximize the number of tiles, we should use as many smallest tiles as possible.

Using only 3' tiles: 3 × 33 = 99

Remaining length = 1, which cannot be covered.

Now try replacing one 3' tile with one 7' tile: 3 × 31 = 93

Remaining length = 7

This can be covered using one 7' tile.

So, a = 31, b = 1, c = 0

Total tiles: x = 31 + 1 = 32

Thus, the maximum number of tiles is: x = 32

Find the Minimum Number of Tiles (y)

To minimize the number of tiles, we should use as many largest tiles as possible.

Using 9 tiles of length 11': 11 × 9 = 99

Remaining length = 1, not possible.

Now try 8 tiles of length 11': 11 × 8 = 88

Remaining length = 12

12 can be covered using four 3' tiles.

So, a = 4, b = 0, c = 8

Total tiles: y = 4 + 8 = 12

Thus, the minimum number of tiles is: y = 12

Calculate x − y

x − y = 32 − 12 = 20

Therefore, Option a is the correct answer.

Q.49) A train has to complete a journey of 800 km. If it meets a minor accident, its speed becomes half of the existing speed. If there is a mechanical defect, the speed becomes one-fourth of the existing speed. On its way, the train meets with a minor accident after 200 km; and 400 km thereafter, it develops a mechanical defect. Had the train developed the mechanical defect after 200 km and met the minor accident 400 km thereafter, it would have taken 4 more hours to reach its destination. What was the original speed of the train in km per hour?

a) 200
b) 190
c) 150
d) 100

Ans) a
Exp) Option a is the correct answer.

Given

- Total journey distance = 800 km
- Let the original speed of the train = s km/h

The journey can be divided into three parts:

- First 200 km
- Next 400 km
- Remaining 200 km

Case 1: Actual Journey

First 200 km

The train travels at its original speed.

Speed = s km/h

Time taken: 200/s hours

After 200 km

The train meets with a minor accident.

Its speed becomes half of the original speed.

New speed: s/2 km/h

It travels the next 400 km at this speed.

Time taken: 400 ÷ (s/2) = 800/s hours

After 600 km

The train develops a mechanical defect.

Its speed becomes one-fourth of the existing speed.

Existing speed = s/2

New speed: (1/4) × (s/2) = s/8 km/h

It travels the remaining 200 km at this speed.

Time taken: 200 ÷ (s/8) = 1600/s hours

Total Time in Case 1

T1 = 200/s + 800/s + 1600/s

T1 = 2600/s hours

Case 2: Hypothetical Journey

Now suppose the mechanical defect occurs first after 200 km, and the accident occurs 400 km later.

First 200 km

The train travels at speed s km/h.

Time taken: 200/s hours

Mechanical Defect After 200 km

Speed becomes one-fourth of the original speed.

New speed: s/4 km/h

The next 400 km is travelled at this speed.

Time taken: 400 ÷ (s/4) = 1600/s hours

Minor Accident After 600 km

The speed now becomes half of the existing speed.

Existing speed = s/4

New speed: (1/2) × (s/4) = s/8 km/h

The remaining 200 km is travelled at this speed.

Time taken: 200 ÷ (s/8) = 1600/s hours

Total Time in Case 2

T2 = 200/s + 1600/s + 1600/s

T2 = 3400/s hours

Use the Given Condition

According to the question:

Case 2 takes 4 more hours than Case 1.

So, T2 − T1 = 4

3400/s − 2600/s = 4

800/s = 4

s = 800/4

s = 200

The original speed of the train was 200 km/h.

Therefore, Option a is the correct answer.

Q.50) In a recruitment process, the selection of candidates is based on their performance in three components. The weightages of the components 1, 2 and 3 are 0-2, 0-3 and 0-5, respectively. Use the data given below and find the cutoff score if exactly three candidates are to be selected :

Candidate	Score in component 1	Score in component 2	Score in component 3
1	5	4	6
2	4	6	5
3	3	2	8
4	9	4	3
5	8	8	2

a) 5.1
b) 5.2
c) 5.3
d) 5.4

Ans) a
Exp) Option a is the correct answer

Given

The weighted score is calculated using:

Weighted Score = (0.2 × Component 1) + (0.3 × Component 2) + (0.5 × Component 3)

Exactly three candidates are to be selected.

Calculate Weighted Scores

Candidate 1: Score = (0.2 × 5) + (0.3 × 4) + (0.5 × 6) = 1.0 + 1.2 + 3.0 = 5.2

Candidate 2: Score = (0.2 × 4) + (0.3 × 6) + (0.5 × 5) = 0.8 + 1.8 + 2.5 = 5.1

Candidate 3: Score = (0.2 × 3) + (0.3 × 2) + (0.5 × 8) = 0.6 + 0.6 + 4.0 = 5.2

Candidate 4: Score = (0.2 × 9) + (0.3 × 4) + (0.5 × 3) = 1.8 + 1.2 + 1.5 = 4.5

Candidate 5: Score = (0.2 × 8) + (0.3 × 8) + (0.5 × 2) = 1.6 + 2.4 + 1.0 = 5.0

Arrange Scores in Descending Order

Candidate	Weighted Score
1	5.2
3	5.2
2	5.1
5	5.0
4	4.5

Determine the Cutoff Score

Exactly three candidates must be selected.

The top three scores are:

- 5.2
- 5.2
- 5.1

Therefore, the minimum score required for selection is 5.1.

Hence, the cutoff score is 5.1.

Therefore, Option a is the correct answer.

Q.51) Consider the following three statements, namely S1, S2 and S3:
S1. Protecting the environment is an existential exigency for humans, given the impact of environmental degradation on climate change.
S2. Scientific consensus has not been achieved with regard to the extent of the contribution of human intervention to climate change.
S3. Environmental activism includes climate alarmism and other extremist points of view that often become the focus of climate change deniers.
Which of the following relationships based on the statements given above is/are correct?
1. S3 is a counterpoint to S1
2. S3 is unconnected to S1 and S2
3. S2 could be the reason for S3
Select the answer using the code given below.
a) 2 and 3 only
b) 1, 2 and 3
c) 1 and 2 only
d) 3 only

Ans) d
Exp) Option d is the correct answer.
Statement 1 is incorrect. Statement 1 discusses the need of protecting the environment and statement 3 discusses the nature of environmental activism. Therefore, statement 3 is not a counterpoint to statement 1.
Statement 2 is incorrect. All three statements are connected as they discuss the **common theme of environment.**
Statement 3 is correct. Statement 2 highlights the l**ack of consensus on the contribution of human intervention to climate change**, it **creates uncertainty and allows climate alarmism** mentioned in statement 3.

Q.52) Match List-I with List-II and select the answer using the code given below the Lists:

List-I (Relationship category)	**List-II (Communication type)**
A. Between cricket captain and team members	1. Informal and firm
B. Between judge and lawyers in court	2. Informal and open-ended
C. Between Vice Chancellor and Deputy Registrar	3. Formal and open-ended
D. Between peers and coworkers	4. Formal and firm

Code :
A B C D
a) 1 3 4 2
b) 1 4 3 2
c) 2 4 3 1
d) 2 3 4 1

Ans) b

Exp) Option b is the correct answer.

A matches with 1. Communication between the cricket captain and team members is characterized as informal. Also, as the captain leads the team, the communication is firm for effective leadership.

B matches with 4. Communication between the judge and lawyers in the court is characterized as formal and as the words of the judge are binding, the communication is firm.

C matches with 3. Communication between the Vice Chancellor and Deputy Registrar is characterized as formal. Also, as they could discuss issues, it is open-ended.

D matches with 2. Communication between peers and coworkers is characterized as informal. As there is no hierarchy between them, the communication is open-ended and not binding.

Q.53) Match List-I with List-II and select the answer using the code given below the Lists:

List-I (Tool of communication)	**List-II (Purpose)**
A. Memorandum	1. To record decisions
B. Flyer	2. To inform confidentially
C. Bcc	3. To intimate a directive
D. Minutes	4. To disseminate non-targeted information

Code :

A B C D

a) 1 4 2 3

b) 1 2 4 3

c) 3 4 2 1

d) 3 2 4 1

Ans) c

Exp) Option c is the correct answer.

A matches with 3. Memorandums are written messages used to intimate a directive.

B matches with 4. Flyer is a form of advertisement used to disseminate non-targeted information.

C matches with 2. Blind carbon copy (Bcc) in emails allows you to send a copy of an email to multiple recipients without the other recipients knowing who else received it.

D matches with 1. Minutes are the written records of the meetings of an organization.

Q.54) Which among the following actions would constitute the most appropriate directive(s) in resolving interpersonal conflict in an office with culturally diverse personnel?

1. Direct personnel to practise activities that are the cultural markers of diverse groups
2. Allow conflicts to resolve naturally over time to set an appropriate precedent of leadership
3. Encourage personnel to seek each other's perspectives

Select the answer using the code given below.

a) 1 and 3

b) 2 only
c) 3 only
d) 2 and 3

Ans) c
Exp) Option c is the correct answer.
Statement 1 is incorrect. Directing personnel to practice activities of other groups might seem imposition of cultures and not help in resolving interpersonal conflict.
Statement 2 is incorrect. Allowing conflicts to persist and taking no action may escalate the conflicts and impact the productivity of personnel. Therefore, it is incorrect.
Statement 3 is correct. This seems to be the most appropriate choice as it **allows personnel to resolve conflicts by incorporating diverse views** through discussions.

Q.55) Match List-I with List-II and select the answer using the code given below the Lists :

List-I(Barrier to communication)	List-II(Example)
A. Semantic	1. Lack of feedback
B. Cognitive	2. Misunderstanding the meaning of a word
C. Organisational	3. Fear of social stigma
D. Affective	4. Information overload

Code :
A B C D
a) 3 1 4 2
b) 3 4 1 2
c) 2 1 4 3
d) 2 4 1 3

Ans) d
Exp) Option d is the correct answer.
A matches with 2. Semantic relates to language, words and their meaning.Misunderstanding the meaning of a word therefore is an example of semantic barrier to communication.
B matches with 4. Cognitive abilities refer to the mental ability to process information. Information overload is therefore an example of a cognitive barrier to communication.
C matches with 1. An organizational barrier to communication refers to any obstacle within an organization's structure, policies, procedures, or work environment that hinders the effective flow of information. Lack of feedback is an example.
D matches with 3. Affective barriers to communication relates to the emotional factors that hinder communication. Fear of social stigma is an example.

Q.56) You are required to design a 'questionnaire' to be filled on-location by visitors, based on the following objective while writing a report :

"To determine the feasibility of setting up a family-oriented vacation resort in the vicinity of a lake destination in the mountains"
Which of the following heads would you include in the questionnaire to make it most appropriate for your purpose?
1. Size of family
2. Budget
3. Number of earners in the family
4. Food allergies and dietary restrictions
Select the answer using the code given below.
a) 1 and 3
b) 1, 2 and 4
c) 1 and 2 only
d) 2 and 3

Ans) c
Exp) Option c is the correct answer.
Statement 1 is correct. The size of the family is an important parameter to know the capacity requirements of the resort.
Statement 2 is correct. The budget is essential for determining the feasibility of the investment in setting up a resort.
Statement 3 is incorrect. The number of earners in a family is not relevant in determining the establishment of a resort.
Statement 4 is incorrect. Dietary restrictions and allergens are crucial for planning the logistics of hospitality at the resort. However, it would be included once the resort is established. Therefore statement 4 is incorrect.

Q.57) With reference to 'circular letters', which of the following statements is/are correct?
1. Circular letters are usually addressed to a group of people.
2. Non-standard and customized content is typical of circular letters.
3. Circular letters are used to intimate appraisals and increments of employees within organisations.
4. Circular letters are less cost-effective than personalised and specific recipient-directed letters.
Select the answer using the code given below.
a) 1 and 2
b) 2 and 4
c) 1, 3 and 4
d) 1 only

Ans) d
Exp) Option d is the correct answer.
Statement 1 is correct. A circular letter is a document used for mass communication to a large audience, such as employees, customers, or shareholders.
Statement 2 is incorrect. Circular letters use standardized and uniform content so that the exact same message reaches every recipient.

Statement 3 is incorrect. Performance appraisals are sent via confidential, personalized letters, not through a public circular.
Statement 4 is incorrect. Printing or emailing one standard message to a number of people is more cost-effective than drafting and sending individual, tailored messages to each recipient.

Q.58) Three partners A, B and C entered into a business. A invested one-third of the capital for one-third duration. B invested one-fourth of the capital for one-fourth duration. C invested the remaining capital for the whole duration. Out of a profit of ₹ 17,000, how much profit will C get?
a) ₹ 12,000
b) ₹ 10,000
c) ₹ 12,500
d) ₹ 10,750

Ans) a
Exp) Option a is the correct answer.

Given:

Three partners A, B, and C entered into a business.

- A invested one-third of the capital for one-third of the duration
- B invested one-fourth of the capital for one-fourth of the duration
- C invested the remaining capital for the whole duration

The total profit is ₹17,000.

In partnership problems, profit is shared in proportion to capital multiplied by time.

Assume convenient values

Take total capital = 12 units
Take total time = 12 units

(This is done to simplify fractions)

Find individual investments

- A invests: capital = 4 units, time = 4 units
- B invests: capital = 3 units, time = 3 units
- C invests: remaining capital = 5 units, time = 12 units

Calculate profit weights

- A = 4 × 4 = 16
- B = 3 × 3 = 9

- C = 5 × 12 = 60

So, profit ratio = 16 : 9 : 60

Total parts

Total = 16 + 9 + 60 = 85 parts

Value of one part

17,000 ÷ 85 = 200

C's share

C's share = 60 × 200 = ₹12,000

Conclusion

C's profit = ₹12,000

Therefore, Option a is the correct answer.

Q.59) There are two chemicals which do not react with each other. A container contains 10 litres of the chemical A. One litre of this chemical is removed from it and one litre of the chemical B is poured. Then one litre of the mixture is removed from the container and one litre of B is poured. If this process of replacing one litre of the mixture by one litre of B is performed once more, then what is the volume of B that is present in the container approximately (in percentage)?
a) 25
b) 27
c) 29
d) 31

Ans) b
Exp) Option b is the correct answer.

Given

- A container initially contains 10 litres of Chemical A.
- Chemical A and Chemical B do not react with each other.
- One litre of liquid is removed from the container and replaced with one litre of Chemical B.
- This process is repeated two more times (total 3 times in all).

We are required to find the approximate percentage of Chemical B in the final mixture.

Instead of tracking Chemical B directly, it is easier to track the remaining amount of Chemical A.

Each time 1 litre is removed from 10 litres, only 9/10 of the previous amount of A remains.

Initial quantity: Chemical A initially = 10 litres

After 1st replacement: Remaining A = 10 × (9/10)

After 2nd replacement: Remaining A = 10 × (9/10) × (9/10)

After 3rd replacement: Remaining A = $10 \times (9/10)^3 = 10 \times 729/1000 = 7.29$ litres

Calculate Chemical B

Total volume remains constant at 10 litres.

So, B = 10 − 7.29 = 2.71 litres

Percentage of B = (2.71 / 10) × 100 = 27.1%

Conclusion

Approximate percentage of Chemical B = **27%**

Therefore, Option b is the correct answer.

Q.60) A shopkeeper employs a delivery boy and gives him a motorcycle for home delivery. For every delivery, the boy is given ₹ 5. At the end of the day, he also gets ₹ 2 for every kilometre of the distance covered in the day. The boy wants to earn more than ₹ 500 a day, but does not want to travel more than 100 km. Which of the following numbers of deliveries would definitely meet his target?
a) 80
b) 85
c) 90
d) The question cannot be answered due to insufficient data

Ans) d
Exp) Option d is the correct answer

Given

- Earnings per delivery = ₹5
- Earnings per kilometre = ₹2
- Total earnings must be **more than ₹500**
- Total distance travelled in a day is **at most 100 km**

Let:

- Number of deliveries = n

- Total distance travelled = D km (where D ≤ 100)

Important missing detail: The problem does not specify the distance between successive deliveries, making D variable and uncertain.

Total earnings expression

Total earnings = earnings from deliveries + earnings from distance

So, Total earnings = 5n + 2D

Required condition: 5n + 2D > 500

Key idea of "definitely"

To "definitely" meet the target, the condition must hold in **all possible scenarios**, including:

- Best-case distance scenario (maximum D)
- Worst-case distance scenario (minimum D)

Since D is not fixed, we must test extreme cases.

Case 1: Best-case scenario (maximum distance = 100 km)

Take D = 100 km

For 80 deliveries:

Total earnings = 5×80 + 2×100 = 400 + 200 = ₹600

So, in this case, 80 deliveries work.

Case 2: Worst-case scenario (minimum distance ≈ 0 km)

If deliveries are extremely close (same building/nearby area), total distance can be effectively 0.

Test options:

- 80 deliveries: 5×80 + 2×0 = ₹400 (fails)
- 85 deliveries: 5×85 + 2×0 = ₹425 (fails)
- 90 deliveries: 5×90 + 2×0 = ₹450 (fails)

So in this case, none of the options meet the target.

Key observation

The result depends entirely on an **unknown variable (distance between deliveries)**.

- If deliveries are far apart → even 80 may be sufficient
- If deliveries are clustered → even 90 is insufficient

Hence, no option guarantees the condition in all cases.

Conclusion

Since the distance per delivery is not defined, the total earnings cannot be uniquely determined from the number of deliveries alone.

Therefore, Option d is the correct answer.

Directions for the next 5 (five) items :
Each item in this section contains a question followed by two statements. Answer each item using the following instructions and mark your response on the Answer Sheet accordingly.
(a) Select this option if the question can be answered using one of these statements alone, but cannot be answered using other statement
(b) Select this option if the question can be answered using either statement alone
(c) Select this option if the question can be answered using both the statements together, but cannot be answered using either statement alone
(d) Select this option if the question cannot be answered even using any of the statements

Q.61) Question:
X receives three coins of different denominations : 1, 2, 5, 10 and 20. If the total amount received by X is m, does X receive a coin of denomination 5?
Statement I :
m is not a prime number.
Statement II :
The sum of the digits of m is greater than 5.

Ans) a
Exp) Option a is the correct answer

Given

A set of coins is given: **{1, 2, 5, 10, 20}**.
Three coins of different denominations are selected, and their total value is **m**.

We need to determine: Does the selection include a coin of denomination 5?

List all possible sums

We form all combinations of 3 distinct coins.

Without 5:

- 1 + 2 + 10 = 13
- 1 + 2 + 20 = 23
- 1 + 10 + 20 = 31

- 2 + 10 + 20 = 32

With 5:

- 1 + 2 + 5 = 8
- 1 + 5 + 10 = 16
- 1 + 5 + 20 = 26
- 2 + 5 + 10 = 17
- 2 + 5 + 20 = 27
- 5 + 10 + 20 = 35

Check Statement I (m is not a prime number)

Non-prime values:

- With 5: 8, 16, 26, 27, 35
- Without 5: 32

Observation:

- If m = 32 → no 5 included
- If m = 8 → 5 included

So Statement I does not uniquely determine whether 5 is included.

Statement I is **insufficient**

Check Statement II (sum of digits of m > 5)

Now check digit sums:

Without 5:

- 13 → 1+3 = 4 (≤5)
- 23 → 2+3 = 5 (≤5)
- 31 → 3+1 = 4 (≤5)
- 32 → 3+2 = 5 (≤5)

With 5:

- 8 → 8 (>5)
- 16 → 7 (>5)
- 17 → 8 (>5)

- 26 → 8 (>5)
- 27 → 9 (>5)
- 35 → 8 (>5)

Key observation:

- All values WITH 5 have digit sum > 5
- All values WITHOUT 5 have digit sum ≤ 5

So Statement II uniquely identifies whether 5 is included.

Statement II is **sufficient**

Conclusion

- Statement I alone → insufficient
- Statement II alone → sufficient

Therefore, Option a is the correct answer.

Q.62) Question:
For two distinct real numbers x and y, which of them is bigger?
Statement I :
$x^2 < y < 1$
Statement II :
$y < \sqrt{x} < 1$

Ans) d
Exp) Option d is the correct answer

Given:

Two distinct real numbers **x and y** are given.

We need to determine: **Which of x and y is greater?**

Analyze Statement I ($x^2 < y < 1$)

We are given:

- $x^2 < y < 1$

This implies:

- y is positive (since $x^2 \geq 0$ and $y > x^2$)
- but no fixed relation between x and y is given

Test cases:

Case 1: $x = 0.5, y = 0.6$

- $x^2 = 0.25$
- $0.25 < 0.6 < 1$ (valid)
- Here: $y > x$

Case 2: $x = -0.5, y = 0.6$

- $x^2 = 0.25$
- condition holds
- Here: $y > x$

Case 3: $x = 0.9, y = 0.82$

- $x^2 = 0.81$
- $0.81 < 0.82 < 1$ (valid)
- Here: $x > y$

Conclusion for Statement I:

It allows both possibilities:

- $x > y$
- $y > x$

So, **Statement I alone is insufficient**.

Analyze Statement II ($y < \sqrt{x} < 1$)

We are given:

- $y < \sqrt{x} < 1$

This implies:

- x must satisfy $0 \leq x < 1$ (since $\sqrt{x}$ exists and < 1)
- but relationship between x and y is still unclear

Test cases:

Case 1: $x = 0.25 \rightarrow \sqrt{x} = 0.5, y = 0.1$

- valid since $0.1 < 0.5$
- Here: $x > y$

Case 2: $x = 0.25 \rightarrow \sqrt{x} = 0.5, y = 0.4$

- valid since $0.4 < 0.5$
- Here: $y > x$

Conclusion for Statement II:

Both possibilities exist:

- $x > y$
- $y > x$

So, **Statement II alone is insufficient**.

Analyze Both Statements Together

Combine:

- $x^2 < y < 1$
- $y < \sqrt{x} < 1$

So:
$x^2 < y < \sqrt{x} < 1$

This places y strictly between x^2 and $\sqrt{x}$.

Now check whether this fixes the relation between x and y.

Test cases:

Case 1: $x = 0.25$

- $x^2 = 0.0625$
- $\sqrt{x} = 0.5$
- choose $y = 0.4$
- valid chain: $0.0625 < 0.4 < 0.5$
- result: $y > x$

Case 2: $x = 0.25$

- choose $y = 0.1$
- valid chain: $0.0625 < 0.1 < 0.5$
- result: $x > y$

Conclusion for both statements together:

Even after combining both conditions:

- x > y is possible
- y > x is also possible

So, no unique ordering is determined.

Conclusion

- Statement I alone → insufficient
- Statement II alone → insufficient
- Both together → still insufficient

Therefore, Option d is the correct answer.

Q.63) Question:
If x and y are integers, then is x even?
Statement I :
x^2 y^2 is even
Statement II :
$1 + x^2 + y^2$is odd

Ans) c
Exp) Option c is the correct answer.

Given

- x and y are integers
- We need to determine whether **x is even**

Analyze Statement I (x^2y^2 is even)

Given: x^2y^2 is even

Since $x^2y^2 = (xy)^2$, this implies:

- xy is even (because only even squared gives even result)

So:

- At least one of x or y is even

Possible cases:

1. x even, y odd → x is even (YES)
2. x odd, y even → x is odd (NO)
3. both even → x is even (YES)

Conclusion:

We cannot uniquely determine whether x is even.

Statement I is insufficient

Analyze Statement II ($1 + x^2 + y^2$ is odd)

Given: $1 + x^2 + y^2$ is odd

Subtract 1: $x^2 + y^2$ is even

Now: Sum of two integers is even only if both have same parity

So:

- x^2 and y^2 are either both even OR both odd
- which means:
    - x and y are both even OR both odd

Cases:

1. both even → x is even (YES)
2. both odd → x is odd (NO)

Conclusion:

Cannot determine whether x is even.

Statement II is insufficient

Combine both statements

From Statement I: at least one of x or y is even

From Statement II: x and y must have same parity

Now check consistency:

If both were odd: violates Statement I (since xy would be odd, not even)

So both odd is impossible.

Thus only remaining case: both x and y are even

Therefore: x must be even

Conclusion

- Statement I alone → insufficient
- Statement II alone → insufficient
- Both together → sufficient

Both statements together are sufficient, but neither alone is sufficient

Therefore, Option c is the correct answer.

Q.64) Question:
X is a collection of certain odd numbers whereas Y is a collection of certain even numbers. T consists of the numbers all of which are either from X or from Y. Is every number of T from Y?
Statement I :
The sum of any two numbers belonging to T is even.
Statement II :
If both p and q are picked from T, then (p - 1)q is even

Ans) d
Exp) Option d is the correct answer

Given

- X is a collection of certain odd numbers
- Y is a collection of certain even numbers
- T consists of numbers that are either from X or from Y

We need to determine: Is every number of T from Y?

We need to determine whether **all elements of T are even**, i.e., whether T ⊆ Y.

Analyze Statement I

Given:
Sum of any two numbers in T is even.

Rules:

- even + even = even
- odd + odd = even
- even + odd = odd

Since the sum of any two elements in T is always even: T cannot contain both odd and even numbers

So T must be either all even, OR all odd

Cases:

- If all even → answer is YES (all from Y)
- If all odd → answer is NO (not from Y)

Conclusion:

Cannot determine uniquely.

Statement I is insufficient

Analyze Statement II

Given:
For any p, q in T, (p − 1)q is even.

Check possibilities:

Case 1: T is all even

- p even → (p − 1) odd
- q even
- odd × even = even --▫ condition satisfied

Case 2: T is all odd

- p odd → (p − 1) even
- q odd
- even × odd = even ---▫ condition satisfied

Case 3: mixed set (even + odd)

- choose p even, q odd
- (p − 1) = odd
- odd × odd = odd ---▫ violates condition

So mixed set is impossible.

Thus T is either all even OR all odd

Conclusion:

Still cannot determine which.

Statement II is insufficient

Combine both statements

Both statements lead to the same restriction: T is either all even OR all odd

No statement tells us which one actually holds.

So:

- Could be all from Y (Yes)
- Could be all from X (No)

Conclusion

Even after using both statements together, the answer cannot be uniquely determined.

Therefore, Option d is the correct answer.

Q.65) Question:
If x, y and z are integers, each greater than 1, then is x a prime number?
Statement I :
$xy^2 = 116$
Statement II :
$xz = 261$

Ans) a
Exp) Option a is the correct answer.

Given

- x, y, z are integers
- x, y, z > 1

We need to determine whether **x is a prime number**

Analyze Statement I ($xy^2 = 116$)

Factorize 116: $116 = 2^2 \times 29$

We are given: $xy^2 = 116$, with x > 1 and y > 1

So y^2 must be a perfect square factor of 116.

Possible square factor: $4 = 2^2$

So: $y^2 = 4 \rightarrow y = 2$

Substitute:
$x \times 4 = 116$
$x = 29$

Now 29 is a prime number

So x is uniquely determined as prime.

Statement I is sufficient

Analyze Statement II ($xz = 261$)

Factorize 261:

$261 = 3^2 \times 29 = 9 \times 29$

We are given:
xz = 261, with x > 1 and z > 1

Possible factor pairs:

- x = 3, z = 87 → x is prime
- x = 9, z = 29 → x is composite
- x = 29, z = 9 → x is prime
- x = 87, z = 3 → x is composite

So x can be prime or composite depending on factorization

Statement II is insufficient

Conclusion

- Statement I alone → sufficient (x is definitely 29, a prime)
- Statement II alone → insufficient

Therefore, Option a is the correct answer.

Directions for the next 2 (two) items :
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

'Kalagram', the cultural village set up at the Maha Kumbh Mela, unfolded as a mosaic of India's diverse regions, each represented by seven meticulously crafted 'Sanskriti Angans'—stepping through the grand portal was like entering another world. These thematic zones, inspired by iconic temples like the Dakshineshwar Kali Temple and the Brahma Mandir, were treasure troves of regional artistry. Bengal's Pattachitra paintings, Assam's bamboo crafts, Tamil Nadu's Thanjavur paintings, and Madhya Pradesh's tribal sculpture—all were showcased in these living galleries where 230 master artisans breathed life into them using age-old techniques, their hands shaping India's ancient history into creations to behold.

Q.66) Which of the following conclusions are valid?
1. Seven Sanskriti Angans, representing different regions of India, had been showcased in Kalagram.
2. Regional artistry was recognised via the inspiration drawn from iconic temples.
3. India's ancient history had been crafted by the contemporary craftsmanship of 230 artisans into creations to behold.
4. Art forms from all regions of India had been showcased in these living galleries.
Select the answer using the code given below.
a) 1 and 2 only
b) 2, 3 and 4

c) 1, 2 and 4
d) 1 and 3

Ans) a
Exp) Option a is the correct answer.
Statement 1 is valid. The passage explicitly states "**India's diverse regions, each represented by seven meticulously crafted 'Sanskriti Angans'**" have been showcased at Kalagram.
Statement 2 is valid. The passage mentions "**These thematic zones, inspired by iconic temples like the Dakshineswar Kali Temple and the Brahma Mandir, were treasure troves of regional artistry**". Therefore, statement 2 is correct.
Statement 3 is invalid. Contemporary artisans cannot create or craft *ancient* history; they can only replicate or be inspired by ancient traditions. Therefore, 3 is incorrect.
Statement 4 is invalid. While the passage mentions that Kalagram showcases art forms from several regions, **we cannot conclude that it showcases art forms from all regions.**

Q.67) Which one of the following statements is **not** correct?
a) Paintings from four States of India have been mentioned.
b) Stepping into Kalagram is likened to stepping into another world.
c) The Angans have been described as living galleries.
d) Kalagram is divided into thematic zones, inspired by well-known temples of India.

Ans) a
Exp) Option a is the correct answer.
Only paintings from Tamil Nadu and Bengal have been mentioned explicitly. Therefore, the statement is incorrect and thus is the correct option.

Q.68) The weight of X, in kg, is denoted by X. The weights of A, B, C, D, P, Q, R and S are measured. Given :
A + B + C + D = 17
A + C = 6
P + Q + S + D = 15
P + Q + R + B = 17
P = R and Q = S
Which one of the following statements is correct?
a) B and D together weigh less than the total weight of P and Q.
b) P and Q together weigh more than the total weight of A and C.
c) P weighs more than Q.
d) Q weighs more than P.

Ans) b
Exp) Option b is the correct answer.

Given:

The weights (in kg) of A, B, C, D, P, Q, R and S satisfy:

- A + B + C + D = 17
- A + C = 6
- P + Q + S + D = 15
- P + Q + R + B = 17
- P = R and Q = S

Find B + D

Given:
A + B + C + D = 17
A + C = 6

Substitute:

(A + C) + B + D = 17
6 + B + D = 17
B + D = 11

Simplify equations using P = R and Q = S

From: P + Q + S + D = 15
Since S = Q:

P + 2Q + D = 15 → (1)

From: P + Q + R + B = 17
Since R = P:

2P + Q + B = 17 → (2)

Combine equations

Add (1) and (2):

(P + 2Q + D) + (2P + Q + B) = 15 + 17

3P + 3Q + B + D = 32

Substitute B + D = 11:

3P + 3Q + 11 = 32

3(P + Q) = 21

P + Q = 7

Compare required expressions

We now have:

- B + D = 11
- P + Q = 7
- A + C = 6

Option (a): B + D < P + Q

11 < 7 → False

Option (b): P + Q > A + C

7 > 6 → True

Option (c) and (d): P vs Q

We only know P + Q = 7, not individual values
So cannot determine relationship between P and Q

Conclusion

Only option (b) is definitely true based on the given data.

P and Q together weigh more than A and C together

Therefore, Option b is the correct answer.

Q.69) How many words can one form by shuffling the letters of the word QUEUE, if Q is always followed by U? The words thus formed need not necessarily have any meaning.
a) 6
b) 8
c) 10
d) 12

Ans) d
Exp) Option d is the correct answer.

Given

- Word: **QUEUE**
- Letters: Q, U, E, U, E
- Repetition: U repeats twice, E repeats twice
- Condition: **Q must always be immediately followed by U**

Understand the letters

The word QUEUE contains:

- Q = 1

- U = 2
- E = 2

Total letters = 5

Apply the condition (Q followed by U)

Since Q must always be immediately followed by U, treat **"QU" as a single fixed block**.

Now the entities become:

- (QU) as one unit
- U (remaining one U)
- E
- E

So total units to arrange = 4

Arrange the units

We now arrange: (QU), U, E, E

Here: E repeats twice

So total arrangements = 4! / 2! = 24 ÷ 2 = 12

Important check

We do NOT multiply by 2! for internal arrangement of QU because: Q must come before U (fixed order only)

Conclusion

Total valid arrangements = 12

Therefore, Option d is the correct answer.

Q.70) X, Y and Z jump forward 4', 6' and 5', respectively. At 8 AM, they all land on mark 199'. How many times will they all land on the same mark (need not be at the same moment) between mark 195' and 1000', if all of them cross mark 1000' by 9 AM?
a) 11
b) 12
c) 13
d) 14

Ans) d
Exp) Option d is the correct answer.

Given

At 8 AM, three jumpers X, Y, and Z land at mark 199'.
They then continue jumping forward as follows:

- X jumps 4 feet each time
- Y jumps 6 feet each time
- Z jumps 5 feet each time

We are to find how many times they all land on the same mark between 195' and 1000' (inclusive), given that all cross 1000' by 9 AM.

Express landing positions

Since all start from 199':

- X lands at: 199 + 4a
- Y lands at: 199 + 6b
- Z lands at: 199 + 5c

For all three to land on the same mark, the distance from 199 must be common to 4, 6, and 5.

Find LCM of step sizes

LCM(4, 6, 5) = 60

So all common landing marks occur every 60 feet from 199.

Thus, common marks are: 199 + 60k (where k is an integer)

Apply range condition

We need marks between 195 and 1000: $195 \leq 199 + 60k \leq 1000$

Subtract 199: $-4 \leq 60k \leq 801$

Divide by 60: $-0.0667 \leq k \leq 13.35$

Find integer values of k

Possible integer values: k = 0, 1, 2, ..., 13

Total values = 14

Verify endpoints

- k = 0 → 199 (valid)
- k = 13 → 199 + 780 = 979 (valid)

So all values from 0 to 13 are within range.

Conclusion

The number of times they all land on the same mark is 14.

Therefore, Option d is the correct answer.

Directions for the next 2 (two) items :
Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

Sport is not just about winning medals or getting jobs through a sports quota. Today's generation is struggling with issues like depression and anxiety. Parents often say that their children are inactive and rarely leave the house. Sport can help tackle these problems. From sport you can learn time management, fitness, teamwork, coordination, and so much more. We need to develop a culture in which sport is seen as a way of life—a path to building a healthier, happier society.

Q.71) Which of the following conclusions are valid?
1. Sport is more than just games; it is a way of life.
2. Sport can help mitigate the problems of seclusion among the young.
3. Earning laurels in sport can help one secure a job on the basis of an assigned quota.
4. Standard corporate sector skills cannot be learnt through sport.
Select the answer using the code given below.
a) 1 and 3 only
b) 2 and 4 only
c) 1, 2 and 4
d) 1, 2 and 3

Ans) d
Exp) Option d is the correct answer.
Statement 1 is correct. The passage states that "**sports is seen as a way of life**". Therefore, statement 1 is correct.
Statement 2 is correct. The passage states that "**Parents often say that their children are inactive and rarely leave the house. Sports can help tackle these problems**." Therefore, statement 2 is correct.
Statement 3 is correct. The passage states that **laurels in sports help secure a job through sports quota.**
Statement 4 is incorrect. The **passage focuses on highlighting the value of sports** rather than stating that standard corporate sector skills cannot be learnt from sports.

Q.72) Which of the following statements is/are correct?
1. Parents are not encouraging enough when it comes to children playing sport.
2. Participation in sporting activities can help develop life skills.
3. Sport as a way of life can help evolve the very nature of society itself.

Select the answer using the code given below.
a) 1 and 3
b) 2 and 3
c) 2 only
d) 3 only

Ans) b
Exp) Option b is the correct answer.
Statement 1 is incorrect. The passage states that parents state that children rarely leave their houses. But **whether parents encourage them or not is not clearly stated.**
Statement 2 is correct. The passage states that "**From sports, you can learn time management, fitness, teamwork, coordination, and so much more**." Therefore, statement 1 is correct.
Statement 3 is correct. The passage states that "**We need to develop a culture in which sports is seen as a way of life- a path to building a healthier, happier society**."Therefore, statement 3 is correct.

Q.73) A toy *T* jumps forward or backward. In each forward jump, it moves 5' forward whereas in each backward jump, it moves 2' backward. If in 31 jumps, *T* moves exactly 15' forward, then what is the difference of the number of forward and backward jumps?
a) 6
b) 7
c) 8
d) 9

Ans) d
Exp) Option d is the correct answer.

Given

- Each forward jump = +5 feet
- Each backward jump = −2 feet
- Total number of jumps = 31
- Net displacement = 15 feet forward

Define variables

Let:

- f = number of forward jumps
- b = number of backward jumps

Form equations

From the problem:

Total jumps: $f + b = 31 \rightarrow (1)$

Net displacement: $5f - 2b = 15 \rightarrow (2)$

Solve the system

Multiply equation (1) by 2:

$2f + 2b = 62 \rightarrow (3)$

Now add (2) and (3):

$(5f - 2b) + (2f + 2b) = 15 + 62$
$7f = 77$
$f = 11$

Find backward jumps

Substitute $f = 11$ into equation (1):

$11 + b = 31$
$b = 20$

Find the required difference

Difference $= |f - b| = |11 - 20| = 9$

Conclusion

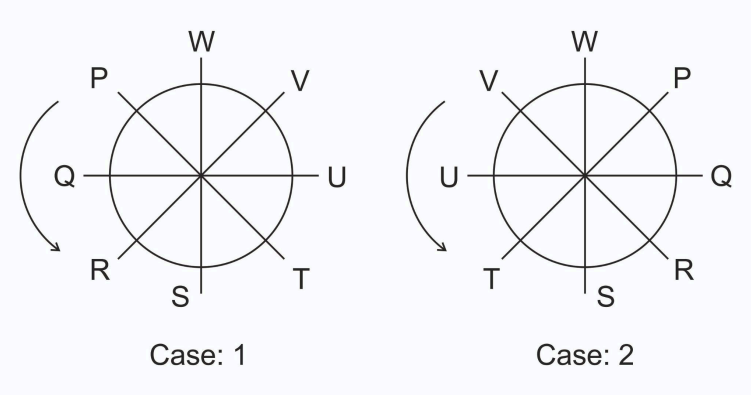
The difference between forward and backward jumps is 9.

Therefore, Option d is the correct answer.

Q.74) Eight persons P, Q, R, S, T, U, V and W sit around a round table in eight different seats placed with equal distance between any two consecutive seats. Both P and R are adjacent to Q. Both T and R are adjacent to S. Both U and W are adjacent to V. S and W are on opposite chairs. If while going in the clockwise direction around the table from P, one meets R before T, then how many persons shall Q cross while moving in the clockwise direction around the table before meeting W?
a) 5
b) 4
c) 2
d) 1

Ans) a
Exp) Option a is the correct answer.

After analyzing the instructions, there are two possibilities:



Given that upon moving from P in the clockwise direction one meets R before T we accept Case 1 and discard Case 2.

From case 1 we can see that Q will cross 5 people before meeting W in the clockwise direction

Therefore, Option a is the correct answer.

Q.75) The top of a table is rectangular and its dimensions are 6' x 10'. Two rectangular portions of the table top are painted in blue colour; both these portions have dimensions 2.5' x 8' and each of them has exactly two sides common with two edges of the table top. If the table is fixed to the ground and the remaining portion of the table top is painted in white, how many different patterns are possible when observed from above?
a) 2
b) 4
c) 6
d) 8

Ans) b
Exp) Option b is the correct answer

Given:

- A rectangular table top has dimensions 6 feet × 10 feet.
- Two identical rectangular regions are painted blue on the table.
- Each blue region has dimensions 2.5 feet × 8 feet.
- Each blue region must have exactly two sides coinciding with the edges of the table top.
- The remaining unpainted portion of the table top is painted white.
- The problem asks for the number of distinct patterns formed when viewed from above.

Understanding the placement condition

- Each blue rectangle must share exactly two sides with the boundary of the table.
- This is only possible if the rectangle is placed in a corner of the table.
- Therefore, each blue rectangle can occupy one of the four corners:
    - Top-left (TL)
    - Top-right (TR)
    - Bottom-left (BL)
    - Bottom-right (BR)

So initially, number of ways to choose 2 corners out of 4 is:

- 4 choose 2 = 6 possible pairs

Fixing orientation of the rectangle

- Each blue rectangle is 8 ft × 2.5 ft
- Table width is 6 ft, so 8 ft cannot fit along width
- Therefore:
    - 8 ft side must lie along the 10 ft length
    - 2.5 ft side lies along the 6 ft width

So orientation is fixed for both rectangles.

Checking all possible corner pairs

We test the 6 possible placements:

Case 1: Same row pairs

- (TL, TR)
- (BL, BR)

Observation:

- Both rectangles extend 8 ft along the 10 ft length
- Total required length = 8 + 8 = 16 ft
- Available length = 10 ft

Conclusion:

- Overlap occurs
- These cases are invalid

Invalid cases = 2

Case 2: Same column pairs

- (TL, BL)
- (TR, BR)

Observation:

- Each rectangle uses 2.5 ft along the 6 ft width
- Total width used = 2.5 + 2.5 = 5 ft
- Available width = 6 ft

Conclusion:

- No overlap
- Valid configurations

Valid cases = 2

Case 3: Diagonal pairs

- (TL, BR)
- (TR, BL)

Observation:

- Rectangles are placed at opposite corners
- They do not overlap in either direction

Conclusion:

- Valid configurations

Valid cases = 2

Total number of valid patterns

- Valid vertical pairs = 2
- Valid diagonal pairs = 2

Total valid patterns = 2 + 2 = 4

Therefore, Option b is the correct answer.

Directions for the next 2 (two) items:

Read the following passage and answer the items that follow. Your answers should be based solely on the passage.

Passage

How is deflation done? Most countries use a method called 'double deflation', where input and output prices are deflated separately. Consider a manufacturer importing oil for use in production. If oil prices fall, output prices do not and quantities remain the same, real value added should not change. But if the same deflator is used for inputs and outputs, as in India, it would look as if the manufacturer had become more productive.

Q.76) Which of the following statements is/are correct?
1. Real value should not change in the instance of static output cost and unchanged quantities against falling oil prices.
2. Deflators are to be used separately for inputs and outputs, and this is a practice universally adopted by all economies.
Select the answer using the code given below.
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Ans) a
Exp) Option a is the correct answer.
Statement 1 is correct. The passage explicitly states "**If oil prices fall, output prices do not, and quantities remain the same, real value added should not change**." Therefore, statement 1 is correct.
Statement 2 is incorrect. The passage mentions that **India does not use double deflation.**
Therefore, statement 2 is incorrect.

Q.77) Which of the following assumptions is/are valid?
1. Deflation strategies can be used to make manufacturers appear to be doing better than they actually are.
2. When input and output prices are both deflated against a single input price, it is referred to as 'double deflation'.
Select the answer using the code given below.
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Ans) a
Exp) Option a is the correct answer.
Statement 1 is correct. The passage states that "**If the same deflator is used for inputs and outputs, as in India, it could look as if the manufacturer had become more productive.**" Therefore, statement 1 is correct.

Statement 2 is incorrect. The passage states that **when input and output prices are deflated separately, it is referred to as double deflation.** Therefore, statement 2 is incorrect.

Q.78) A pattern formed by two characters a and b is repeated more than once in the following string :

x *b* x *a* x *a* x x *a* x *a* x *bab*

What is x x in the 7th and 8th positions from the left in the above string?

a) *aa*
b) *ab*
c) *ba*
d) *bb*

Ans) d
Exp) Option d is the correct answer

There are 15 positions, suggesting a repeating block of length 5 repeated 3 times.
Group into blocks of 5: (x b x a x) (a x x a x) (a x b a b)
Now determine the repeating pattern column-wise:
1st positions: x,a,a⇒a
2nd positions: b,x,x⇒b
3rd positions: x,x,b⇒b
4th positions: a,a,a⇒a
5th positions: x,x,b⇒b
So the repeating pattern is: abbab
Now write positions: 1:a, 2:b, 3:b, 4:a, 5:b, 6:a, 7:b, 8:b,...
Hence: 7th position = b and 8th position = b

Q.79) If 10^m x 1000 x n = 75^{25} x 25^{32} x 32^{75}, where n is not divisible by 10, then the value of m is

a) 101
b) 111
c) 121
d) 131

Ans) b
Exp) Option b is the correct answer

Given

$10^m \times 1000 \times n = 75^{25} \times 25^{32} \times 32^{75}$, where n is not divisible by 10.

Find the value of m.

We use prime factorisation focusing on 2 and 5 since 10 = 2 × 5.

Simplify LHS

$1000 = 10^3$

So: $10^m \times 1000 \times n = 10^m \times 10^3 \times n = 10^{m+3} \times n$

Now: $10 = 2 \times 5$

So: $10^{m+3} = 2^{m+3} \times 5^{m+3}$

Therefore: LHS = $2^{m+3} \times 5^{m+3} \times n$

Factorise RHS

$75 = 3 \times 5^2$
$\rightarrow 75^{25} = 3^{25} \times 5^{50}$

$25 = 5^2$
$\rightarrow 25^{32} = 5^{64}$

$32 = 2^5$
$\rightarrow 32^{75} = 2^{375}$

So: RHS = $2^{375} \times 5^{114} \times 3^{25}$

Extract powers of 10

We form $10 = 2 \times 5$ pairs.

- 2-power = 375
- 5-power = 114

So number of 10 pairs = 114

Rewrite: $2^{375} \times 5^{114} = (2^{114} \times 5^{114}) \times 2^{261} = 10^{114} \times 2^{261}$

So: RHS = $10^{114} \times (2^{261} \times 3^{25})$

Compare both sides

LHS = $10^{m+3} \times n$
RHS = $10^{114} \times (2^{261} \times 3^{25})$

So: n = $2^{261} \times 3^{25}$ (not divisible by 10, condition satisfied)

Now equate powers of 10:

$m + 3 = 114$
$m = 111$

Conclusion

$m = 111$

Therefore, Option b is the correct answer.

Q.80) The speed of a train T is 100 km per hour and the speed of a person P is 4 km per hour. *T* crosses *P* in 15 seconds, if *P* travels along the direction of motion of *T*. If *P* travels along the opposite direction of *T*, then in how much time does *T* cross *P*, in seconds, approximately?
a) 13.51
b) 13.65
c) 13.85
d) 14.05

Ans) c
Exp) Option c is the correct answer.

Given:

Speed of train (T) = 100 km/h
Speed of person (P) = 4 km/h
Time taken when both move in same direction = 15 seconds

When P moves in the same direction as the train, T crosses P in 15 seconds.
When P moves in the opposite direction of the train, find the time taken (in seconds, approximately).

We use the concept of relative speed and the relation:

Distance = Speed × Time

Case 1 (Same Direction)

Relative speed = 100 − 4 = 96 km/h

Convert to m/s: 96 × (5/18) = 80/3 m/s

Let length of train = L

Since train crosses person in 15 seconds:

L = (80/3) × 15
L = 80 × 5 = 400 meters

So, train length = 400 m

Case 2 (Opposite Direction)

Relative speed = 100 + 4 = 104 km/h

Convert to m/s: 104 × (5/18) = 260/9 m/s

Time Calculation

Time = Distance / Speed
Time = 400 ÷ (260/9)

Time = 400 × 9 / 260
Time = 3600 / 260
Time ≈ 13.846 seconds ≈ 13.85 seconds

Conclusion

The time taken when moving in opposite directions is approximately **13.85 seconds**.

Therefore, Option c is the correct answer.