

RRB JE CBT-1 Memory Based Paper 20 Feb 2026

Q.1 What is the preferred unit used in the scientific literature to express the ratio between two sound intensities?

- A. Decibels
- B. Pascal
- C. Phon
- D. Hertz

Answer: A

Sol: The correct answer is **(A) Decibels**

Explanation:

- The decibel (dB) is a logarithmic unit used to express the ratio of two values of a physical quantity, often sound intensity.
- It is the standard unit for measuring the loudness of sound.

Information Booster:

- The threshold of hearing is 0 dB, while sound above 85 dB can cause hearing damage over time.

Additional Knowledge:

- Hertz (Option D): Unit of frequency (cycles per second).
- Pascal (Option B): Unit of pressure; sound pressure can also be measured in Pascals.

Q.2 Sharing borders with the states of Kerala and Karnataka, Mudumalai National Park of Tamil Nadu is a part of which biosphere reserve of India?

- A. Nokrek Biosphere Reserve
- B. Kangchenzonga Biosphere Reserve
- C. Nilgiri Biosphere Reserve
- D. Agasthyamalai Biosphere Reserve

Answer: C

Sol: The correct answer is **(C) Nilgiri Biosphere Reserve**

Explanation:

- Mudumalai National Park and Wildlife Sanctuary is located in the Nilgiri District of Tamil Nadu.
- It is a part of the Nilgiri Biosphere Reserve, which was the first biosphere reserve in India established in 1986.

Information Booster:

- It shares boundaries with Wayanad Wildlife Sanctuary (Kerala) and Bandipur National Park (Karnataka).

Additional Knowledge:

- Nokrek (Option A): Located in Meghalaya.
- Kangchenzonga (Option B): Located in Sikkim.

Q.3 If the 6-digit number N01M22 is divisible by 11, then which of the options below can give a possible correct relation between M and N?

- A. $M - N = 1$
- B. $M + N = -1$
- C. $M - N = 5$
- D. $M = N$

Answer: A

Sol: Given

Number: N01M22

Divisible by 11

Formula Used

Divisibility rule of 11: Difference between sum of digits at odd places and sum of digits at even places must be 0 or a multiple of 11.

Solution

Number: N 0 1 M 2 2

Places (from right):

Odd places (1st, 3rd, 5th): 2, M, 0

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Even places (2nd, 4th, 6th): 2, 1, N
 Sum of digits at odd places = $2 + M + 0 = M + 2$
 Sum of digits at even places = $2 + 1 + N = N + 3$
 Difference = (Sum of odd places) - (Sum of even places)
 Diff = $(M + 2) - (N + 3)$
 Diff = $M - N - 1$
 For divisibility by 11, Diff must be 0 or 11.
 Case 1: $M - N - 1 = 0$
 $M - N = 1$
 Case 2: $M - N - 1 = 11$
 $M - N = 12$ (Not possible for single digits)
 So, the relation is $M - N = 1$
Final Answer
 So the correct answer is (a)

Q.4 What are the gross market borrowings estimated at in BE 2026-27?

- A. ₹11.7 lakh crore
- B. ₹14.0 lakh crore
- C. ₹17.2 lakh crore
- D. ₹28.7 lakh crore

Answer: C

Sol: The correct answer is (c) ₹17.2 lakh crore

Explanation:

- . Gross market borrowings for BE 2026-27 are estimated at ₹17.2 lakh crore.
- . These borrowings finance the fiscal deficit.
- . They include dated securities and treasury bills.
- . Borrowings are aligned with fiscal consolidation targets.

Information Booster:

- . Net market borrowings from dated securities are estimated at ₹11.7 lakh crore.
- . Stable borrowing plans support bond market confidence.

Q.5 A, B, C, D, Q, R and S are sitting around a circular table, facing the centre of the table. B sits third to the left of Q. R sits second to the left of S. Q is an immediate neighbour of both A and R. C is not an immediate neighbour of B. How many people sit between D and R, when counted from the right of D?

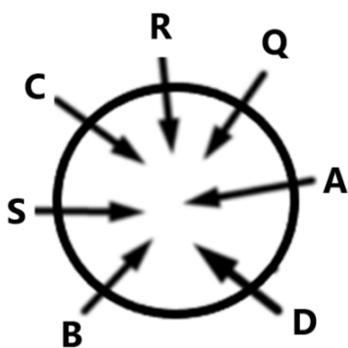
- A. Three
- B. One
- C. Two
- D. Four

Answer: C

Sol: Given:

- A, B, C, D, Q, R and S are sitting around a circular table, facing the centre of the table.
- B sits third to the left of Q.
- R sits second to the left of S.
- Q is an immediate neighbour of both A and R. C is not an immediate neighbour of B.

From the given information seating arrangement will be:



So, **Two** people sit between D and R, when counted from the right of D.
 Thus, the correct option is: (c)

Q.6 A hemispherical bowl is of radius 7.7 cm. It is to be painted from inside as well as outside. Find the cost (in ₹) of painting the bowl at a rate of ₹17 per 7 cm^2 .
[Take $\pi = \frac{22}{7}$]

- A. 1810.16
- B. 745.36
- C. 1025.24
- D. 1620.35

Answer: A

Sol: Given:

Radius of hemispherical bowl (r) = 7.7 cm

Painting rate = ₹17 per 7 cm^2

Bowl is painted inside and outside

Formula Used:

Surface area of a hemisphere = $2\pi r^2$

Total surface area to be painted = $2 \times$ (surface area of hemisphere)

Solution:

Surface area = $2\pi r^2$

$$\text{Surface area} = 2 \times \frac{22}{7} \times (7.7)^2$$

$$\text{Surface area} = 2 \times \frac{22}{7} \times (7.7 \times 7.7)$$

$$\text{Surface area} = 2 \times 22 \times 1.1 \times 7.7$$

$$\text{Surface area} = 44 \times 8.47$$

$$\text{Surface area} = 372.68 \text{ cm}^2$$

$$\text{Total surface area} = 2 \times 372.68 \text{ cm}^2$$

$$\text{Total surface area} = 745.36 \text{ cm}^2$$

$$\text{Cost per } 7 \text{ cm}^2 = ₹17$$

$$\text{Number of } 7 \text{ cm}^2 \text{ units} = \frac{745.36}{7} = 106.48$$

$$\text{Total cost} = 106.48 \times 17$$

$$\text{Total cost} = 1810.16$$

Q.7 Who was the Chairman and Chief Executive Officer (CEO) of the Railway Board as on 1st May 2025?

- A. Naveen Gulati
- B. Hitendra Malhotra
- C. Satish Kumar
- D. Braj Mohan Agrawal

Answer: C

Sol:

The correct answer is (c) Satish Kumar

Explanation:

- As of May 1, 2025, Satish Kumar held the position of **Chairman and CEO of the Railway Board**.
- The Railway Board is the apex body of the Indian Railways, responsible for its administration and policy-making.
- The role of CEO was introduced in 2020 as part of the restructuring of the Railway Board to streamline operations.

Information Booster:

- The Chairman and CEO is the highest-ranking civil servant in the Ministry of Railways.
- This position involves overseeing the modernization of tracks, safety protocols, and the expansion of Vande Bharat trains.

Additional Knowledge:

- Indian Railways is one of the world's largest railway networks under a single management.
- The first railway in India ran between Roorkee and Piran Kaliyar in 1851, though the first passenger train ran between Bombay and Thane in 1853.

Q.8 This question is based on the five, three-digit numbers given below.

(Left) 625 247 156 289 362 (Right)

(NOTE: All operations to be done from left to right.)

What will be the resultant if the third digit of the highest number is added to the second digit of the lowest number?

- A. 8
- B. 7
- C. 10
- D. 12

Answer: C

Sol: Given: (Left) 625 247 156 289 362 (Right)

Highest = 625

Lowest = 156

Third digit of highest (625) = 5

Second digit of lowest (156) = 5

Add: $5 + 5 = 10$

So, **10** will be the resultant if the third digit of the highest number is added to the second digit of the lowest number.

Thus, correct option is (c).

Q.9 Which area of the main stem and roots contains the spongy, soft parenchyma cells that carry and store nutrients for the plant?

- A. Metaxylem
- B. Stele
- C. Cortex
- D. Pith

Answer: D

Sol:

The correct answer is (d) Pith

Explanation:

- Pith consists mainly of parenchyma cells.
- Parenchyma cells store food and nutrients.
- Pith is located at the central part of the stem.
- It provides storage and internal support.
- Therefore, pith is the correct answer.

Information Booster:

- Parenchyma cells are living cells.
- They have thin cell walls.
- Important for storage and transport.

Additional Knowledge (Incorrect Options):

- Metaxylem – Conducts water.
- Stele – Central vascular region.
- Cortex – Lies between epidermis and stele.

Q.10 Which two signs should be interchanged to make the given equation correct ?

$$84 - 12 + 72 \div 8 \times 7 = 23$$

- A. \times and \div
- B. $+$ and \times
- C. \div and $-$
- D. $+$ and $-$

Answer: C

Sol: Given: $84 - 12 + 72 \div 8 \times 7 = 23$

Using **BODMAS** rule.

Operation preference wise	Symbol
Brackets	$[], (), \{\}$
Orders, of	$(power), \sqrt{(root)}, of$
Division	\div
Multiplication	\times
Addition	$+$
Subtraction	$-$

Now, we check each options.

Option (a): \times and \div

New equation: $84 - 12 + 72 \times 8 \div 7 = 23$

8 is not divisible by 7.

Option (b): $+$ and \times

New equation: $84 - 12 \times 72 \div 8 + 7 = 23$

$84 - 12 \times 9 + 7 = 23$

$84 - 108 + 7 = 23$

$-17 \neq 23$

Option (c): \div and $-$

New equation: $84 \div 12 + 72 - 8 \times 7 = 23$

$7 + 72 - 8 \times 7 = 23$

$7 + 72 - 56 = 23$

23 = 23

Option (d): $+$ and $-$

New equation: $84 + 12 - 72 \div 8 \times 7 = 23$

$84 + 12 - 9 \times 7 = 23$

$84 + 12 - 63 = 23$

$33 \neq 23$

Thus, correct option is (c).

Q.11 An electric generator is a device that converts ___ energy into electrical energy.

- A. Sound
- B. Chemical
- C. Nuclear
- D. Mechanical

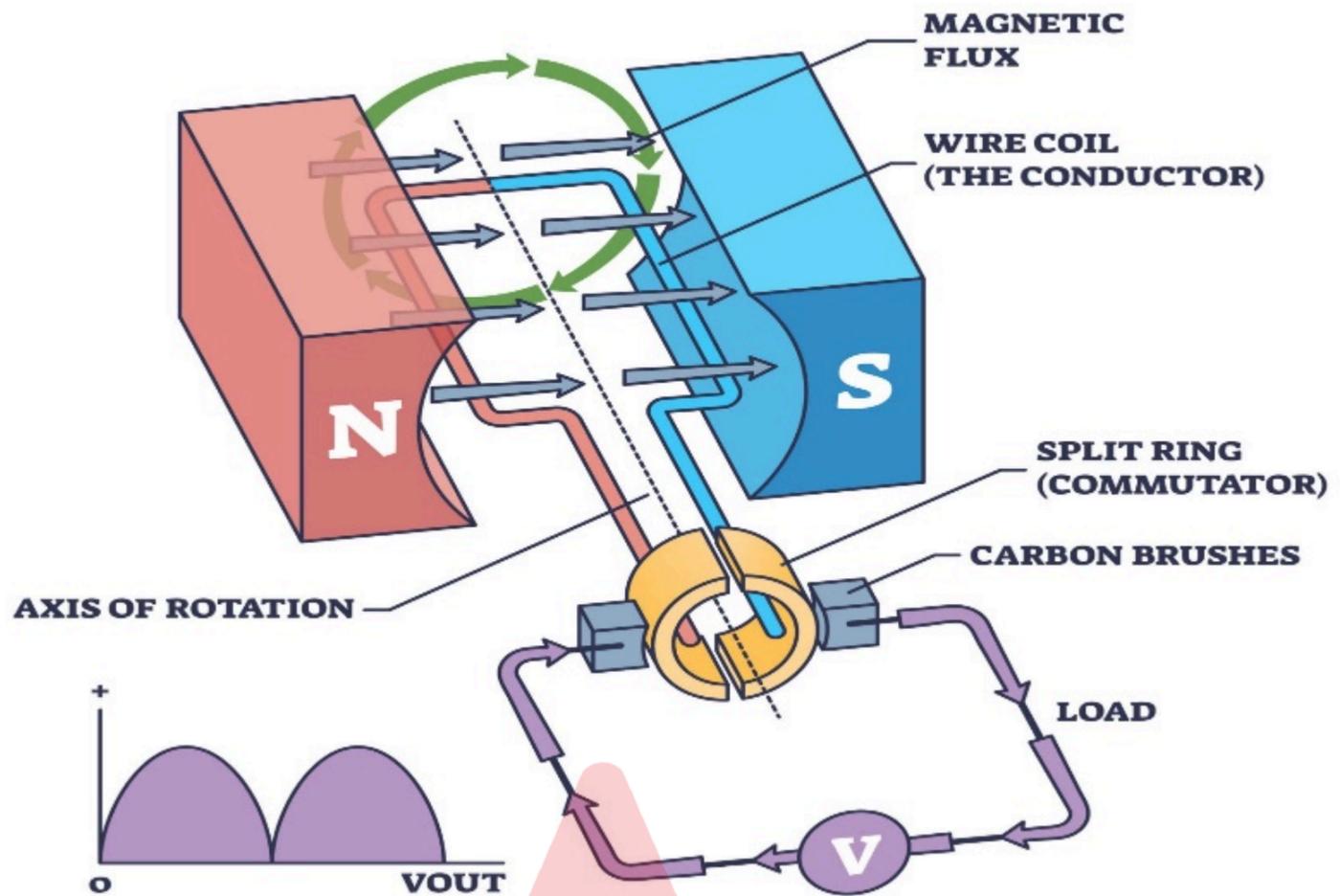
Answer: D

Sol: The correct answer is **(d) Mechanical**

Explanation:

- An electric generator works on the principle of **electromagnetic induction**, discovered by Michael Faraday.
- It uses mechanical energy to rotate a conductor (usually a copper coil) within a magnetic field.
- This rotation changes the magnetic flux, which induces an electromotive force (EMF) and generates an electric current.

DC GENERATOR



Information Booster:

- Generators do not "create" electricity; instead, they use the mechanical energy supplied to them to force the movement of electric charges present in the wire of its coils through an external electric circuit.
- This is the opposite of an **Electric Motor**, which converts electrical energy back into mechanical energy.

Additional Knowledge:

- **Sound Energy:** Energy produced by vibrations; it is usually converted into electrical signals by a microphone.
- **Chemical Energy:** Energy stored in the bonds of chemical compounds; batteries convert chemical energy into electrical energy.
- **Nuclear Energy:** Energy released during nuclear fission or fusion; in nuclear power plants, this energy is first used to create steam (thermal energy) to drive turbines (mechanical energy) before becoming electrical energy.

Q.12 What should come in place of the question mark (?) in the given series based on the English alphabetical order?
LEB QJG VOL ATQ ?

- A. FYV
- B. FVY
- C. FYU
- D. FRT

Answer: A

Sol: Given:

LEB QJG VOL ATQ ?

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: Each letter increases by +5 in alphabetically,

First letters:

L +5 → Q +5 → V +5 → A +5 → F

Second letters:

E +5 → J +5 → O +5 → T +5 → Y

Third letters:

B +5 → G +5 → L +5 → Q +5 → V

So the next term is: **FYV**

Thus, the correct option is: (a)

Q.13 Refer to the following number, symbol series and answer the question. Counting to be done from left to right only.

(Left) 2 / \ < > 2 5 \$ % + 6 3 / 6 5 6 9 3 @ < & (Right)

How many such numbers are there each of which is immediately preceded by another number and also immediately followed by a symbol?

- A. Two
- B. Four
- C. One
- D. Three

Answer: D

Sol: Given:

(Left) 2 / \ < > 2 5 \$ % + 6 3 / 6 5 6 9 3 @ < & (Right)

Logic: Number | Number | Symbol

(Left) 2 / \ < > **2 5 \$ % + 6 3 / 6 5 6 9 3 @ < &** (Right)

So, such **Three** numbers are there each of which is immediately preceded by another number and also immediately followed by a symbol.

Thus, the correct option is: (d)

Q.14 Which of the following animals excretes uric acid in a semi-solid state?

- A. Fish
- B. Birds
- C. Mammals
- D. Amphibians

Answer: B

Sol: The correct answer is **(B) Birds**

Explanation:

- Animals that excrete uric acid are called uricotelic animals.
- Uric acid is excreted in the form of a pellet or paste (semi-solid state) with a minimum loss of water.
- This is a crucial adaptation for water conservation in terrestrial habitats.

Information Booster:

- Examples of uricotelic animals include reptiles, birds, land snails, and insects.

Additional Knowledge:

- Fish (Option A): Most aquatic animals like bony fishes are ammonotelic (excrete ammonia).
- Mammals (Option C): Most mammals are ureotelic (excrete urea).
- Amphibians (Option D): Adult amphibians are generally ureotelic, while their aquatic larvae (tadpoles) are ammonotelic.

Q.15 In a certain code language, 'BIRTH' is written as 'ELUWK'. What is the code for 'HELLO' in that code language?

- A. KHOOR
- B. JHOOQ
- C. KHNNR
- D. KHOOQ

Answer: A

Sol: Given:

BIRTH → ELUWK, HELLO → ?

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: Each letter is shifted +3 in alphabetically.

BIRTH → ELUWK

B+3 → E

I+3 → L

R+3 → U

T+3 → W

H+3 → K

Similarly,

HELLO → ?

H+3 → K

E+3 → H

L+3 → O

L+3 → O

O+3 → R

So, **HELLO → KHOOR**

Thus, the correct option is: (a)

Q.16 What is the largest 4-digit number that is exactly divisible by 72?

- A. 9936
- B. 9960
- C. 9984
- D. 9992

Answer: A

Sol: Given:

Divisor = 72.

We need the largest 4-digit number divisible by 72.

Formula Used:

Dividend = Divisor × Quotient + Remainder

Solution:

The largest 4-digit number is 9999.

Divide 9999 by 72:

$9999 \div 72 = 138$ with a remainder of 63

To find the largest divisible number, subtract the remainder from 9999:

Number = $9999 - 63$

Number = 9936

Final Answer

So the correct answer is (a)

Q.17 Find the value of p so that the expression $(15.97)^3 + 1.4373 \times p + (0.03)^3$ is a perfect cube.

- A. 0.000027
- B. 4096
- C. 16
- D. 47.91

Answer: C

Sol: Given:

Expression: $(15.97)^3 + 1.4373 \times p + (0.03)^3$

Need value of (p) so the entire expression becomes a perfect cube

Concept Used:

Binomial identity for cubes:

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

Solution:

Here, $15.97 = 16 - 0.03$, so $a = 16$, $b = 0.03$

$$(16 - 0.03)^3 + (0.03)^3$$

$$= 16^3 - 3(16)^2(0.03) + 3(16)(0.03)^2$$

$$= 4096 - 23.04 + 0.0432$$

$$= 4073.0032$$

$$\text{Perfect cube condition: } (15.97)^3 + (0.03)^3 + 1.4373p = 16^3$$

Now,

$$4073.0032 + 1.4373p = 4096$$

$$1.4373p = 22.9968$$

$$p = \frac{22.9968}{1.4373} = 16$$

Q.18 A man travels from A to B at a speed of 40 km/h and next from B to C at 60 km/h, where B is between A and C. The ratio of distances between A B and BC is 2 : 3. He travels back from C to A at x km/h. If his average speed for the whole journey is $61\frac{7}{13}$ km/h, then what is the value of x?

- A. 70
- B. 75
- C. 65
- D. 80

Answer: D

Sol: Given:

The ratio of distances between A to B and B to C is 2 : 3

Speed from A to B = 40 km/h

Speed from B to C = 60 km/h

Speed from C to A = x km/h

The average speed for the entire journey = $61\frac{7}{13}$ km/h

Formula Used:

$$\text{Average Speed} = \frac{\text{Total Distance}}{\text{Total Time}}$$

Solution:

Let the distances be 2D and 3D

Total Distance (AB + BC + CA) = 10D

$$\text{Total Time} = \frac{2D}{40} + \frac{3D}{60} + \frac{5D}{x}$$

$$= \frac{D}{20} + \frac{D}{20} + \frac{5D}{x}$$

$$= \frac{2D}{20} + \frac{5D}{x}$$

$$\frac{D}{10} + \frac{5D}{x}$$

Using the formula for average speed:

$$\frac{800}{13} = \frac{10D}{D\left(\frac{1}{10} + \frac{5}{x}\right)}$$

$$\frac{800}{13} = \frac{10}{\frac{1}{10} + \frac{5}{x}}$$

$$\frac{1}{10} + \frac{5}{x} = \frac{10 \times 13}{800} = \frac{130}{800} = \frac{13}{80}$$

$$\frac{5}{x} = \frac{13}{80} - \frac{1}{10}$$

$$\frac{5}{x} = \frac{13}{80} - \frac{8}{80} = \frac{5}{80}$$

$$\frac{5}{x} = \frac{5}{80} \Rightarrow x = 80$$

The value of x is 80 km/h

Q.19 Mahendragiri is the second highest peak of Odisha located in which range?

- A. Eastern Ghats
- B. Western Ghats
- C. Aravalli Range
- D. Vindhya Range

Answer: A

Sol: The correct answer is **(a) Eastern Ghats**

Explanation:

- Mahendragiri is a mountain peak situated in the **Gajapati district** of Odisha.
- It is part of the **Eastern Ghats** and stands at an elevation of approximately 1,501 meters.
- Historically and culturally significant, it is mentioned in ancient literature and associated with the Ramayana and Mahabharata.

Information Booster:

- While Mahendragiri is often cited as a major peak in Odisha, **Deomali** (in Koraput district) is the highest peak in the state, standing at about 1,672 meters.
- The Mahendragiri hill forest is known for its rich biodiversity and was proposed as a **Biosphere Reserve**.

Additional Knowledge:

- **Western Ghats:** A continuous mountain range along the western coast of India, with its highest peak being Anamudi in Kerala.
- **Aravalli Range:** One of the oldest fold mountain systems in the world, located primarily in Rajasthan; its highest peak is Guru Shikhar.
- **Vindhya Range:** A complex system of mountains and hills in central India, acting as a geographical barrier between North and South India

Q.20 Five consecutive even numbers are written in descending order. If 6, 8 and 10 are added to the first, second and third numbers. respectively, and 13 is added to each of the last two numbers. the new sum of the numbers becomes 120% of the sum of the consecutive even numbers initially given. Find the square of the second largest of these five numbers.

- A. 2704
- B. 2116
- C. 1936
- D. 2304

Answer: A

Sol: Given:

Five consecutive even numbers written in descending order

Add 6 to the first

Add 8 to the second

Add 10 to the third

Add 13 to each of the last two

The new total becomes 120% of the original total

Solution:

$$\text{Original sum} = (x + 4) + (x + 2) + x + (x - 2) + (x - 4) = 5x$$

$$\text{New sum} = (x + 4 + 6) + (x + 2 + 8) + (x + 10) + (x - 2 + 13) + (x - 4 + 13)$$

$$= (x + 10) + (x + 10) + (x + 10) + (x + 11) + (x + 9)$$

Now,

$$\text{New sum} = 120\% \text{ of original sum}$$

$$5x + 50 = 1.2 \times 5x$$

$$5x + 50 = 6x$$

$$6x - 5x = 50$$

$$x = 50$$

So, numbers

$$(x + 4 = 54), (x + 2 = 52), (x = 50), (x - 2 = 48), (x - 4 = 46)$$

$$\text{Second largest} = 52$$

$$(52)^2 = 2704$$

Q.21 A cylindrical storage container has a base radius of 4 cm. It consists of 6 stacked disks whose heights form an arithmetic progression, starting from 1 cm for the bottom and 11 cm for the top. What is the total volume? (Use $\pi = 3.14$)

- A. 1808.64 cm³
- B. 1507.20 cm³
- C. 2010.50 cm³
- D. 1205.76 cm³

Answer: A

Sol: Given:

Radius of cylinder (r) = 4 cm

Number of disks = 6

Heights are in Arithmetic Progression

First height (a) = 1 cm

Last height (l) = 11 cm

$\pi = 3.14$

Concept Used:

Sum of Arithmetic Progression and Volume of Cylinder

Formula Used:

$$\text{Sum of AP} = \frac{n}{2} \times (a + l)$$

$$\text{Volume of cylinder} = \pi r^2 h$$

Solution:

$$\text{Total height} = (6/2)(1 + 11)$$

$$= 3 \times 12$$

$$= 36 \text{ cm}$$

$$r^2 = 4^2 = 16$$

$$\text{Total Volume} = \pi r^2 \times (\text{Total height})$$

$$= 3.14 \times 16 \times 36$$

$$= 3.14 \times 576$$

$$= 1808.64 \text{ cm}^3$$

$$\text{Answer} = 1808.64 \text{ cm}^3$$

Q.22 A covered wooden box has the inner measures as 128 cm, 90 cm, 25 cm and the thickness of wood is 5.5 cm. Find the volume of the wood.

- A. 329431 cm³
- B. 217404 cm³
- C. 819832 cm³
- D. 192392 cm³

Answer: B

Sol: .

Given:

Inner dimensions of the box : 128cm ,90cm, 25cm

Thickness of wood = 5.5cm

Formula Used:

Volume of cuboid = L×B×H

Volume of wood =Volume of outer box - Volume of inner box

Solution:

Inner dimensions:

Length =128cm ,Breadth =90cm, Height=25cm

Outer dimensions:

Length =128+2×5.5 =139cm

Breadth =90+2×5.5=101cm

Height=25+2×5.5=36cm

Volume of inner box = 128× 90 × 25 =2,88,000 cubic cm

Volume of outer box = 139× 101 × 36 =5,05,404 cubic cm

Volume of wood = 5,05,404 - 2,88,000 =2,17,404 cubic cm

Q.23 Amit borrowed Rs. 1500 at simple interest for a number of years equal to the rate of interest. At the end of the loan term, he paid Rs. 540 in interest. What was the interest rate?

- A. 6%
- B. 5%
- C. 7%
- D. 8%

Answer: A

Sol: Given

Principal (P) = Rs. 1500

Simple Interest (SI) = Rs. 540

Time (T) = Rate (R)

Formula Used

$$SI = \frac{P \times R \times T}{100}$$

Solution

Since T = R, we substitute T with R in the formula:

$$540 = \frac{1500 \times R \times R}{100}$$

$$540 = 15 \times R^2$$

$$R^2 = \frac{540}{15}$$

$$R^2 = 36$$

$$R = \sqrt{36} = 6$$

So, the interest rate is 6%.

Final Answer

So the correct answer is (a)

Q.24 How many atoms are there in a methane molecule?

- A. 3
- B. 5
- C. 4
- D. 2

Answer: B

Sol: Correct Answer: (B) 5

Explanation:

A methane molecule has the chemical formula **CH₄**, which means:

- **1 carbon atom**
- **4 hydrogen atoms**

Total atoms = 1 + 4 = **5 atoms**

Information Booster:

- Methane is the **simplest hydrocarbon**.
- It is the main component of **natural gas**.
- It has a **tetrahedral structure**.
- Methane is a potent **greenhouse gas**, stronger than CO₂ in trapping heat.

Q.25 Which among the following is not an example of an abiotic natural resource?

- A. Iron
- B. Coal
- C. Silver
- D. Gold

Answer: B

Sol: Correct Answer: (b) Coal

Explanation:

- Abiotic natural resources are **non-living components** of the environment such as minerals and metals.
- Coal is formed from the **remains of ancient plants**, making it a **biogenic (biotic-origin) resource**.
- Hence, coal is **not considered a true abiotic natural resource** in exam classification.

Information Booster:

- Abiotic resources include **metals, minerals, water, air, sunlight**.
- Coal, petroleum, and natural gas are often grouped as **biotic-origin fossil fuels** in EVS/Geography.

Additional Knowledge:

- (a) Iron: A **metallic mineral**; non-living and abiotic.
- (c) Silver: A **precious metal**; abiotic mineral resource.
- (d) Gold: A **metallic mineral**; abiotic natural resource.

Q.26 Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 9 8 5 @ 8 σ 9 π % 2 8 # 1 2 \$ * 8 1 π 5 (Right)

How many such even numbers are there, which are immediately preceded by a symbol and also immediately followed by an even number?

- A. Four
- B. One
- C. Two
- D. None

Answer: B

Sol: Given:

(Left) 9 8 5 @ 8 σ 9 π % 2 8 # 1 2 \$ * 8 1 π 5 (Right)

Logic: Symbol | Even Number | Even Number

Let's check:

(Left) 9 8 5 @ 8 σ 9 π % 2 8 # 1 2 \$ * 8 1 π 5 (Right)

So, such **One** even numbers are there, which are immediately preceded by a symbol and also immediately followed by an even number.

Thus, the correct option is: (b)

Q.27 Which of the following statements regarding human immunoglobulins is/are correct?

1. IgM is usually the first antibody produced in a primary immune response.
2. IgD is mainly found on the surface of B cells and functions as a receptor.
3. IgG is the principal antibody present in mucosal secretions like tears and saliva.

- A. Only 1 and 2 are correct
- B. Only 2 and 3 are correct
- C. Only 1 and 3 are correct
- D. 1, 2 and 3 all are correct

Answer: A

Sol: The correct answer is **(A) Only 1 and 2 are correct**

Explanation:

- **Statement 1 is correct:** IgM (Immunoglobulin M) is the largest antibody and the first to be secreted by the adaptive immune system in response to a fresh infection.
- **Statement 2 is correct:** IgD is present in small amounts in serum but is primarily found on the surface of mature B-lymphocytes, where it acts as an antigen receptor to initiate B cell activation.
- **Statement 3 is incorrect:** IgG is the most abundant antibody in the blood and can cross the placenta. However, **IgA** is the principal antibody found in mucosal secretions like tears, saliva, and colostrum (first milk).

Information Booster:

- **IgE:** Responsible for allergic reactions and protection against parasitic worms.
- **IgG:** Provides long-term immunity and is the only class that can cross the placenta to protect the fetus.

Additional Knowledge:

- The error in Statement 3 lies in the functional description of IgG versus IgA. In competitive exams, the specific location (secretions vs. blood) is a common point of testing for these five classes of antibodies (GAMED: IgG, IgA, IgM, IgE, IgD).

Q.28 In a certain code language,

- A + B means 'A is the son of B',
 - A - B means 'A is the brother of B',
 - A x B means 'A is the wife of B' and
 - A ÷ B means 'A is the father of B'.
- How is C related to M if 'C x V - R ÷ N + M'?

- A. Brother's daughter
- B. Brother's wife
- C. Husband's brother's wife
- D. Husband's brother's daughter

Answer: C

Sol: Given A + B means 'A is the son of B',

Sign + - x ÷

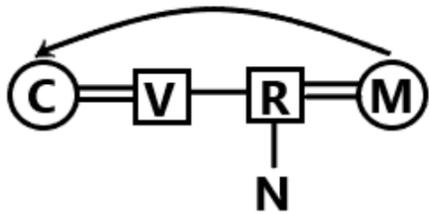
Relationship Son Brother Wife Father

Expression: C x V - R ÷ N + M'?

Symbol in Diagram	Meaning
- / O	Female
+ / □	Male
=	Married Couple
—	Siblings
	Difference Of Generation

According to the given information, family tree will be:

Husband's brother's wife



As per the diagram, C is the **Husband's brother's wife** of M.
Thus, the correct option is **(C) Husband's brother's wife**.

Q.29 In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

TOES - SETO - TEOS
CLAP - PACL - CALP

- A. CALF - FLCA - ALCF
- B. RUST - RSUT - TSUR
- C. TUNE - UNTE - UNET
- D. MICK - KCMI - MCIK

Answer: D

Sol: Given:

TOES - SETO - TEOS
CLAP - PACL - CALP

Let's check:

TOES - SETO - TEOS



CLAP - PACL - CALP



Similarly,

Option D: MICK - KCMI - MCIK



Thus, the correct option is: (d)

Q.30 Which harmful gas has a greater affinity for haemoglobin than oxygen and thus severely impairs human respiration?

- A. Methane (CH₄)
- B. Carbon dioxide (CO₂)
- C. Carbon monoxide (CO)
- D. Nitrogen dioxide (NO₂)

Answer: C

Sol: The correct answer is (c) Carbon monoxide (CO).

- Carbon monoxide binds with haemoglobin **200–250 times more strongly** than oxygen.
- This forms **carboxyhaemoglobin**, reducing oxygen transport in blood.
- Leads to **hypoxia and potential death**.

Information Booster:

- CO is a **colourless, odourless gas**.
- Major source: **incomplete combustion of fuels**.
- Common cause of **accidental poisoning**.

Additional Knowledge:

- CO₂ causes suffocation only at very high concentrations.
- Methane is mainly an **asphyxiant**, not haemoglobin-binding.
- CO poisoning symptoms include **headache, dizziness, and nausea**.

Q.31 What was a major cause behind the 'Deccan Riots' of 1875?

- A. Decline in textile exports
- B. Heavy taxation and exploitation by moneylenders
- C. Introduction of railways
- D. Partition of Bengal

Answer: B

Sol: The correct answer is **(B) Heavy taxation and exploitation by moneylenders**

Explanation:

- The riots began in Supa village (Pune) and spread across the Deccan region.
- Farmers were burdened by high land revenue under the Ryotwari system and trapped in debt cycles by moneylenders (Sahukars).

Information Booster:

- Following the riots, the British government passed the Deccan Agriculturists' Relief Act of 1879 to protect farmers from moneylenders.

Additional Knowledge:

- Partition of Bengal (Option D): Occurred in 1905, much later than the Deccan Riots.

Q.32 Which of the following is an example of a synthetic polymer used in industry?

- A. Starch
- B. Nylon-6,6
- C. Cellulose
- D. Rubber

Answer: B

Sol:

The correct answer is: (b) Nylon-6,6

Explanation:

- Nylon-6,6 is a synthetic polyamide polymer produced by the condensation of hexamethylenediamine and adipic acid.
- It is widely used in textiles, ropes, automotive components, and engineering plastics.
- NCERT Class 12 Chemistry lists nylon as a major example of man-made polymers.
- It exhibits high tensile strength, durability, and resistance to abrasion.
- Synthetic polymers are artificially prepared unlike natural polymers such as starch and cellulose.

Information Booster:

- Nylon-6,6 was the first fully synthetic fiber introduced commercially.
- Used extensively in industrial machinery, gears, bearings, and fabrics.

Additional Knowledge (Incorrect Options):

- Starch (Option a) – Natural polymer (carbohydrate).
- Cellulose (Option c) – Natural plant polymer.
- Rubber (Option d) – Natural rubber is obtained from latex; only vulcanized forms become synthetic-like.

Q.33 What should come in place of the question mark (?) in the given series?

154, 181, 208, ?, 262, 289

- A. 242
- B. 235
- C. 228

D. 260

Answer: B

Sol: Given: 154, 181, 208, ?, 262, 289

Logic: Numbers are increasing + 27 place.

$$154 + 27 = 181$$

$$181 + 27 = 208$$

$$208 + 27 = \mathbf{235}$$

$$235 + 27 = 262$$

$$262 + 27 = 289$$

So, the missing term is **235**.

Thus, correct option is (b).

Q.34 Which acid and its salts are widely used as food preservatives to prevent the growth of mould, yeast and fungi?

- A. Malic acid
- B. Boric acid
- C. Perchloric acid
- D. Sorbic acid

Answer: D

Sol:

The correct answer is (D) Sorbic acid

Explanation:

- Sorbic acid is widely used as a food preservative.
- It effectively inhibits the growth of moulds, yeasts, and fungi.
- Sorbic acid and its salts are used in bakery products, cheese, and beverages.
- Its preservative action works by inhibiting microbial enzyme systems.
- Therefore, sorbic acid is the correct answer.

Information Booster:

- Common salts of sorbic acid include potassium sorbate.
- It is considered safe for consumption within prescribed limits.
- Frequently asked in food chemistry and biology sections.

Additional Knowledge (Incorrect Options):

(A) Malic acid

- Used mainly as an acidulant and flavour enhancer.
- Does not act as a preservative against fungi.

(B) Boric acid

- Toxic when ingested.
- Not permitted as a food preservative.

(C) Perchloric acid

- A strong laboratory acid.
- Not used in food processing or preservation.

Q.35 About enzymes:

1. They lower activation energy.
2. They are substrate specific.
3. They are unaffected by temperature.

- A. 1 and 2
- B. 2 and 3
- C. 1 and 3
- D. 1, 2, and 3

Answer: A

Sol: The correct answer is **(A) 1 and 2**

Explanation:

- **Statement 1 is correct:** Enzymes are biological catalysts. They work by lowering the **activation energy** required for a chemical reaction to occur, thereby speeding up the rate of reaction.
- **Statement 2 is correct:** Enzymes are **substrate-specific**. Due to their unique three-dimensional shapes (active sites), they typically catalyze only one specific reaction or act on a specific class of molecules (Lock and Key hypothesis).
- **Statement 3 is incorrect:** Enzymes are highly sensitive to temperature. Most enzymes have an 'optimum temperature' at which they function best. High temperatures can **denature** (destroy the shape of) enzymes, making them non-functional.

Information Booster:

- **Chemical Nature:** Almost all enzymes are proteins (with the exception of some catalytic RNA molecules called ribozymes).
- **pH Sensitivity:** Like temperature, enzymes also have an optimum pH. For example, Pepsin works best in acidic conditions (pH 2), while Salivary Amylase works near neutral pH.
- **Cofactors:** Some enzymes require non-protein components called cofactors (like vitamins or metal ions) to be active.

Additional Knowledge:

- **Option B and C:** These are incorrect because they include Statement 3, which is fundamentally wrong in biology.
- **Option D:** Incorrect as Statement 3 is false. Understanding that enzymes are proteins is key to realizing why they are affected by temperature (proteins unfold/denature when heated).

Q.36 In a triangle PQR, points M and N lie on QR such that $PM = PN$ and $\angle QPM = \angle RPN$.
If $PQ = (3x + 2)$ units, $QM = x$ units, $PR = (2y + 5)$ units, $RN = y$ units, find the value of $(x + y)$.

- A. 4
- B. 5
- C. 6
- D. 3

Answer: C

Sol: Given:

$$PM = PN$$

$$\angle QPM = \angle RPN$$

$$PQ = 3x + 2$$

$$QM = x$$

$$PR = 2y + 5$$

$$RN = y$$

Formula Used:

$$PQ = PR, \quad QM = RN$$

Solution:

$$QM = RN \Rightarrow x = y \quad (1)$$

$$PQ = PR \Rightarrow 3x + 2 = 2y + 5 \quad (2)$$

Substitute (1) in (2):

$$3x + 2 = 2x + 5$$

$$x = 3$$

$$y = 3$$

$$x + y = 6$$

Final Answer:

6



Q.37 Which statement best explains the Law of Conservation of Energy?

- A. Force equals mass multiplied by acceleration
- B. Energy can neither be created nor destroyed
- C. Every action has an equal and opposite reaction
- D. Pressure is force per unit area

Answer: B

Sol: The correct answer is **(B) Energy can neither be created nor destroyed**

Explanation:

- The Law of Conservation of Energy states that the total energy of an isolated system remains constant.
- Energy can only be transformed from one form to another (e.g., potential to kinetic energy).

Information Booster:

- This is also the First Law of Thermodynamics.

Additional Knowledge:

- Option A: Newton's Second Law of Motion.
- Option C: Newton's Third Law of Motion.

Q.38 Which of the following statements is NOT correct with reference to the main group elements?

- A. Their reactivity does not follow any periodic trend.
- B. They include both s-block and p-block elements.
- C. Their valence shell configurations help predict chemical behaviour.
- D. They are also called representative elements.

Answer: A

Sol: The correct answer is (A) Their reactivity does not follow any periodic trend.

Explanation:

• **Main group elements do follow periodic trends** such as increasing metallic character down a group and increasing non-metallic character across a period.

• Therefore, saying their reactivity "does not follow any trend" is **incorrect**.

Information Booster:

• Main group elements include **Groups 1, 2, and 13–18**.

• Their chemical behaviour is predictable because of **valence shell configurations**.

• They exhibit trends in ionisation energy, atomic radius, electronegativity, and reactivity.

Additional Knowledge:

• **Option B – Correct:** Main group elements include **s-block and p-block**.

• **Option C – Correct:** Their **valence shell configuration** determines their chemical properties.

• **Option D – Correct:** They are indeed called **representative elements**.

Q.39 A shopkeeper claims that he is selling sugar at ₹ 25 per kg which costs him ₹ 30 per kg but he is giving 800 grams of sugar instead of 1000 grams. What is his profit percentage? (correct to two decimal places)

- A. 5.25%
- B. 3.12%
- C. 4.17%
- D. 6.16%

Answer: C

Sol: Given:

Cost price (CP) per kg = Rs. 30

Selling price (SP) per kg = Rs. 25

Instead of selling 1 kg, the shopkeeper gives only 800 grams (i.e., 0.8 kg).

Formula Used:

$$\text{Profit Percentage} = \left(\frac{\text{Profit}}{\text{Cost Price}} \right) \times 100$$

Solution:

Cost Price of 800 gm = $0.8 \times 30 = 24$ Rs.

The shopkeeper sells 800 g for Rs. 25 (even though he claims it's 1 kg).

Selling Price of 800 g = Rs. 25

Profit = Selling Price – Cost Price = $25 - 24 = 1$ Rs

Substituting the values in above formula

$$\text{Profit Percentage} = \left(\frac{1}{24} \right) \times 100 = 4.17\%$$

Thus, profit percentage is 4.17%.

Alternate Method:

C.P. S.P.

30 25

800 1000

24000 25000

24 : 25

$$\text{Profit} = \frac{25 - 24}{24} \times 100 = 4.17\%$$

Q.40 Which mountain range is bound by the Satpura range on the south and the Aravalli on the northwest?

- A. Maikal
- B. Malwa
- C. Bagelkhand
- D. Vindhyan

Answer: D

Sol: The correct answer is (d) Vindhyan

Explanation

- The Vindhyan Range lies between the Aravalli Range to the northwest and the Satpura Range to the south.
- It stretches across central India, mainly through Madhya Pradesh, Uttar Pradesh, and Bihar.
- The Vindhyan Range forms an important watershed dividing the rivers flowing northwards and southwards.

Information Booster

- Rivers like the Son and Chambal originate from the Vindhyan region.
- The range acts as a natural boundary between North India and the Deccan Plateau.

Additional Knowledge

- The Narmada River valley lies between the Vindhyan Range (north) and the Satpura Range (south).
- The Vindhyan Range are geologically older fold mountains, composed mainly of sedimentary rocks.

Q.41 Which Article of the Indian Constitution guarantees freedom of speech and expression?

- A. Article 14
- B. Article 19
- C. Article 21
- D. Article 25

Answer: B

Sol: The correct answer is **(B) Article 19**

Explanation:

- Article 19(1)(a) guarantees to all citizens the right to freedom of speech and expression.
- However, this right is not absolute and is subject to 'reasonable restrictions'.

Information Booster:

- Article 19 also includes the right to assemble peacefully, form associations, and move freely throughout India.

Additional Knowledge:

- Article 25 (Option D): Deals with the freedom of religion.

Q.42 Which situation best represents the law of conservation of momentum?

- A. Falling object accelerating under gravity
- B. Vehicle stopping due to friction
- C. Recoil of a rifle after firing
- D. Satellite revolving around Earth

Answer: C

Sol: The correct answer is **(C) Recoil of a rifle after firing**

Explanation:

- According to the law of conservation of momentum, in an isolated system, the total momentum remains constant.
- When a bullet is fired, the forward momentum of the bullet is balanced by the backward momentum (recoil) of the rifle.

Information Booster:

- Momentum (mv) is the product of mass (m) and velocity (v).

Additional Knowledge:

- Vehicle stopping (Option B): Momentum is not conserved for the vehicle alone because external friction force acts on it.
- Falling object (Option A): Gravity is an external force that changes the object's momentum.

Q.43 Which among the following is not an exhaustible resource?

- A. Natural gas
- B. Petroleum
- C. Biogas
- D. Coal

Answer: C

Sol: Correct Answer: (c) Biogas

Explanation: Biogas is a renewable resource produced from the decomposition of organic waste and can be regenerated continuously, so it is not exhaustible.

Information Booster:

- Exhaustible resources are limited and can be depleted
- Renewable resources can be replenished naturally
- Biogas is produced from animal dung, plant waste, and sewage

Additional Knowledge:

- (a) Natural gas: Fossil fuel, limited in quantity
- (b) Petroleum: Non-renewable fossil fuel
- (d) Coal: Exhaustible fossil fuel

Q.44 Simplify: $3 \left(\left(\frac{7}{3} \right) x^2 - 22x + 19 \right) - 7(x^2 + 9x - 14)$

- A. $-129x - 155$
- B. $-129x + 155$
- C. $129x + 155$
- D. $129x - 155$

Answer: B

Sol: Given:

Expression: $3 \left(\frac{7}{3} x^2 - 22x + 19 \right) - 7(x^2 + 9x - 14)$

Formula Used:

Distribution Law and combining like terms.

Solution:

Multiplying the terms:

$$3 \times \frac{7}{3} x^2 - 3 \times 22x + 3 \times 19 - 7 \times x^2 - 7 \times 9x - 7 \times (-14)$$

Simplifying each term:

$$7x^2 - 66x + 57 - 7x^2 - 63x + 98$$

Grouping like terms:

$$(7x^2 - 7x^2) + (-66x - 63x) + (57 + 98)$$

$$= 0 - 129x + 155$$

$$= -129x + 155$$

Q.45 Which of the following is NOT a prion-related disease?

- A. Kuru
- B. Scrapie
- C. Alzheimer's disease
- D. Creutzfeldt-Jakob disease

Answer: C

Sol: The correct answer is **(C) Alzheimer's disease**

Explanation:

- **Prions** are misfolded proteins that have the ability to transmit their misfolded shape onto normal variants of the same protein. They cause several fatal neurodegenerative diseases.
- **Alzheimer's disease** is a neurodegenerative disorder characterized by the buildup of amyloid-beta plaques and tau tangles, but it is not classified as a prion disease, although research into its 'prion-like' spread of proteins is ongoing.
- Prion diseases are often characterized by a 'spongiform' appearance of the brain under a microscope.

Information Booster:

- **Bovine Spongiform Encephalopathy (BSE):** Commonly known as 'Mad Cow Disease,' this is a well-known prion disease in cattle.
- **Nobel Prize:** Stanley B. Prusiner won the Nobel Prize in 1997 for his discovery of prions.

Additional Knowledge:

- **Kuru (Option A):** A prion disease identified in Papua New Guinea, associated with ritualistic cannibalism.
- **Scrapie (Option B):** A fatal, degenerative prion disease affecting the nervous systems of sheep and goats.
- **Creutzfeldt-Jakob disease (Option D):** The most common human prion disease, which leads to rapid mental deterioration and death.

Q.46 Who among the following passed an Act in 1898, making it an offence to provoke people against the British rulers?

- Lord Mayo
- Lord Northbrook
- Lord Elgin
- Lord Curzon

Answer: D

Sol:

The correct answer is (D) Lord Curzon

Explanation:

- The Indian Penal Code was amended in 1898.
- Section 124A (Sedition Law) was strengthened.
- It made provoking hatred against British rule an offence.
- This amendment was passed during Lord Curzon's tenure.
- Hence, option D is correct.

Information Booster:

- Sedition law became a major tool against nationalist leaders.
- It was widely used against the freedom movement.

Additional Knowledge (Incorrect Options):

- Lord Mayo
 - Served earlier; not associated with 1898 amendment.
- Lord Northbrook
 - No sedition-related law during his tenure.
- Lord Elgin
 - Not linked to IPC amendment of 1898.

Q.47 Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All lions are tigers.

No lion is a cat.

Conclusions (I): Some cats are lions.

Conclusions (II): Some tigers are lions.

- Neither conclusion (I) nor (II) follows.
- Only conclusion (II) follows.
- Only conclusion (I) follows.
- Both conclusions (I) and (II) follow.

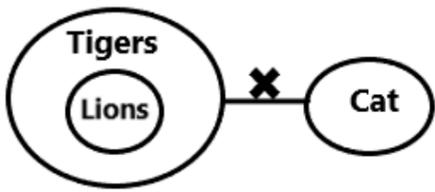
Answer: B

Sol: Statements:

All lions are tigers.

No lion is a cat.

According to the given statement, Venn diagram will be:



Analyse the conclusions:

Conclusions (I): Some cats are lions. → False

If no lion is a cat, then "some cats are lions" cannot be true.

Conclusions (II): Some tigers are lions. → True

If all lions are tigers, then at least some tigers are lions (those lions themselves).

Thus, the correct option is **(B) Only conclusion (II) follows.**

Q.48 Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week. Q has the exam on Monday. P has the exam before R. Only two people have exams between U and Q. V has the exam immediately before U but after S. R has the exam before T. How many people have exams between P and S?

- A. Two
- B. Three
- C. Five
- D. Four

Answer: A

Sol: Given:

Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week.

Q has the exam on Monday.

P has the exam before R.

Only two people have exams between U and Q.

V has the exam immediately before U but after S.

R has the exam before T.

From the given information arrangement will be.

Days	Persons
Monday	Q
Tuesday	S
Wednesday	V
Thursday	U
Friday	P
Saturday	R
Sunday	T

Two people have exams between P and S.

Thus, correct option is (a).

Q.49 Kavya invested amounts in three schemes P, Q, and R at simple interest rates of 11% p.a., 13% p.a., and 16% p.a. respectively. If the total interest in one year was ₹2,850 and the amount in Scheme R was 200% of Scheme P and 300% of Scheme Q, what was the amount invested in Scheme Q?

- A. ₹3677
- B. ₹2750
- C. ₹3000
- D. ₹3250

Answer: A

Sol: Given:

$$\text{Rate of P} = 11\%$$

$$\text{Rate of Q} = 13\%$$

$$\text{Rate of R} = 16\%$$

$$\text{Total interest in 1 year} = 2850$$

$$R = 200\% \text{ of P and } 300\% \text{ of Q}$$

Concept Used:

Simple Interest with ratio-based investments

Formula Used:

$$SI = \frac{P \times R \times T}{100}$$

Solution:

$$\text{Let amount in Q} = x$$

$$R = 3x$$

$$P = \frac{3x}{2}$$

$$\text{Interest from P} = \frac{\frac{3x}{2} \times 11}{100} = \frac{33x}{200}$$

$$\text{Interest from Q} = \frac{13x}{100}$$

$$\text{Interest from R} = \frac{48x}{100}$$

$$\frac{33x}{200} + \frac{13x}{100} + \frac{48x}{100} = 2850$$

$$\frac{33x + 26x + 96x}{200} = 2850$$

$$\frac{155x}{200} = 2850$$

$$155x = 570000$$

$$x = \frac{570000}{155} \approx 3677$$

Final Answer:

3677

Q.50 Which of the following bacterial shapes is capable of forming spores for survival under unfavorable conditions?

- A. Cocci
- B. Bacilli
- C. Spirilla
- D. Vibrio

Answer: B

Sol: The correct answer is **(B) Bacilli**

Explanation:

- Bacilli (rod-shaped bacteria) are the group most commonly associated with endospore formation.
- Examples include *Bacillus* and *Clostridium* genera, which form spores to survive extreme heat, drought, or radiation.

Information Booster:

- Spores are dormant structures, not reproductive ones in this context.

Additional Knowledge:

- Cocci (Option A): Spherical bacteria.
- Spirilla (Option C): Spiral-shaped bacteria.

Q.51 Based on the English alphabetical order, three of the following four letter cluster pairs are alike in a certain way and thus form a group. Which is the one that DOES NOT belong to that group? (NOTE: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster.)

- A. TM-WR
- B. OH-RN
- C. NG-QL
- D. JC-MH

Answer: B

Sol:

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: The first letter increases by +3 and the second letter increases by +5

Option A: TM – WR

T (20) → W (23) = +3

M (13) → R (18) = +5

Option B: OH – RN

O (15) → R (18) = +3

H (8) → N (14) = +6

Pattern: +3, +6

Option C: NG – QL

N (14) → Q (17) = +3

G (7) → L (12) = +5

Option D: JC – MH

J (10) → M (13) = +3

C (3) → H (8) = +5

So, odd one out is: **OH – RN**

thus, the correct option is: (b)



Q.52 Seven boxes V, W, X, Y, Z, Q and R are kept one over the other but not necessarily in the same order. V is kept second from the bottom. Only three boxes are kept between V and Y. Z is kept at one of the positions below V. Only Q is kept between Y and R. W is kept at one of the positions above Y. How many boxes are kept between X and Y?

- A. Three
- B. Four
- C. Two
- D. One

Answer: C

Sol: Given:

Seven boxes V, W, X, Y, Z, Q and R are kept one over the other but not necessarily in the same order.

V is kept second from the bottom.

Only three boxes are kept between V and Y.

Z is kept at one of the positions below V.

Only Q is kept between Y and R.

W is kept at one of the positions above Y.

PositionBox

6 V

5 X

4 R

3 Q

2 Y

1 W

Two boxes are kept between X and Y.
Thus, correct option is (c).

Q.53 What is the pressure (in Pa) exerted when a thrust of 1000 N is applied to an area of 5 m²?

- A. 200
- B. 50
- C. 100
- D. 25

Answer: A

Sol: The correct answer is **(A) 200**

Explanation:

- Pressure (P) is defined as Thrust (Force) per unit Area.
- Formula: $P = \frac{F}{A}$
- Calculation: $P = \frac{1000 \text{ N}}{5 \text{ m}^2} = 200 \text{ Pa}$ (Pascals).

Information Booster:

- The SI unit of pressure is the Pascal (Pa), named after Blaise Pascal.

Additional Knowledge:

- If the area decreases, the pressure increases for the same force.

Q.54 Which postulate of Dalton's atomic theory explains the Law of Definite Proportions?

- A. Atoms of different elements have different masses and properties.
- B. Atoms of the same element are identical in mass and size.
- C. Atoms are indivisible and indestructible.
- D. Atoms combine in simple whole-number ratios to form compounds.

Answer: D

Sol:

The correct answer is (d) Atoms combine in simple whole-number ratios to form compounds

Explanation:

- Law of Definite Proportions states fixed composition of compounds.
- Dalton explained this using fixed atomic ratios.
- Chemical combination follows simple numerical relationships.

Information Booster:

- Supports law proposed by Joseph Proust.
- Foundation for modern stoichiometry concepts.

Additional Knowledge (Incorrect Options):

- (a) Different masses
 - Explains elemental distinction, not proportions.
- (b) Identical atoms
 - Relates to elemental uniformity.
- (c) Indivisible atoms
 - Later disproved by subatomic particles.

Q.55 The marks obtained by the students of a class are given. Find the standard deviation of the marks (rounded off to 2 decimal places).
65, 47, 59, 75, 82, 91, 55 and 78

- A. 12.53
- B. 13.99
- C. 14.25
- D. 15.05

Answer: B

Sol: Given:

Marks = 65, 47, 59, 75, 82, 91, 55, 78

Formula Used:

The standard deviation (σ) for ungrouped data is given by:

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

where \bar{x} is the mean and n is the number of observations.

$$\bar{x} = \frac{\sum x}{n}$$

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

Solution:

Mean:

$$\bar{x} = \frac{65 + 47 + 59 + 75 + 82 + 91 + 55 + 78}{8} = \frac{552}{8} = 69$$

Find deviations ($x - \bar{x}$) and squares:

x	x - 69	(x - 69) ²
65	-4	16
47	-22	484
59	-10	100
75	6	36
82	13	169
91	22	484
55	-14	196
78	9	81

$$\sum (x - \bar{x})^2 = 1566$$

$$\text{Variance} = \frac{1566}{8} = 195.75$$

Standard Deviation:

$$\sigma = \sqrt{195.75} = 13.99$$

Q.56 Simplify: $2 \left(\left(\frac{7}{2} \right) x^2 - 28x + 17 \right) - 7(x^2 + 6x - 11)$.

- A. $-98x - 111$
- B. $98x - 111$
- C. $-98x + 111$
- D. $98x + 111$

Answer: C

Sol: Given:

Expression: $2 \left(\frac{7}{2} x^2 - 28x + 17 \right) - 7(x^2 + 6x - 11)$

Solution:

Expand the terms using the distributive property.

First part: $2 \times \frac{7}{2} x^2 - 2 \times 28x + 2 \times 17$
 $= 7x^2 - 56x + 34$

Second part: $-7 \times x^2 - 7 \times 6x - 7 \times (-11)$
 $= -7x^2 - 42x + 77$

Combine the like terms from both parts:

$$(7x^2 - 7x^2) + (-56x - 42x) + (34 + 77)$$

$$= 0x^2 - 98x + 111$$

$$= -98x + 111$$

Final Answer

So the correct answer is (c)

Q.57 All children, regardless of whether they are boys or girls, will inherit which of the following chromosomes from their mother?

- A. A Y chromosome
- B. Only Chromosome 21
- C. Only Chromosome 13
- D. An X chromosome

Answer: D

Sol: The correct answer is **(D) An X chromosome**

Explanation:

- Females have two X chromosomes (XX). Therefore, an egg cell always carries an X chromosome.
- Males have one X and one Y chromosome (XY). The father determines the sex of the child by contributing either an X or a Y chromosome.

Information Booster:

- Humans have 23 pairs of chromosomes, where the 23rd pair is the sex chromosome.

Additional Knowledge:

- Y chromosome (Option A): Only inherited from the father.
- Chromosome 21 (Option B): An autosome; everyone inherits two copies (one from each parent). Abnormalities here lead to Down Syndrome.

Q.58 Which of the following processes is absent in C_4 plants?

- A. Transpiration
- B. Photorespiration
- C. Photosynthesis
- D. Respiration

Answer: B

Sol: The correct answer is (b) Photorespiration

Explanation:

- C₄ plants possess a special mechanism to minimise or virtually eliminate photorespiration.
- In C₄ plants, CO₂ is first fixed in mesophyll cells by the enzyme PEP carboxylase, which has a high affinity for CO₂ and does not bind oxygen.
- The fixed CO₂ is then transported to bundle sheath cells, where the Calvin cycle operates in a high-CO₂ environment.
- This spatial separation prevents RuBisCO from reacting with oxygen, thereby suppressing photorespiration.
- According to INFORMATION BOOSTER: Biology (Class 11 – Photosynthesis in Higher Plants), absence of photorespiration makes C₄ plants more efficient, especially under high temperature and low CO₂ conditions.

Information Booster:

- Examples of C₄ plants include maize, sugarcane, sorghum, and millet.
- C₄ plants show Kranz anatomy, a characteristic arrangement of bundle sheath cells.
- Due to reduced photorespiration, C₄ plants have higher productivity than C₃ plants.

Additional Knowledge (Information about incorrect options):

Transpiration (Option a)

- Present in all green plants; essential for water movement and cooling.

Photosynthesis (Option c)

- C₄ plants perform photosynthesis efficiently using a modified pathway.

Respiration (Option d)

- Cellular respiration occurs in all living plants, including C₄ plants.

Q.59 Seven people, A, B, L, M, N, S, and T are sitting in a row, facing north. Only L sits to the left of S. Only four people sit between L and N. Only M sits between A and B, and A is not an immediate neighbour of N.

Who sits at the extreme right of the line?

- A. A
- B. N
- C. D
- D. T

Answer: D

Sol: Given:

Seven people, A, B, L, M, N, S, and T are sitting in a row, facing north.

Only L sits to the left of S.

Only four people sit between L and N.

Only M sits between A and B, and A is not an immediate neighbour of N.



So, **T** sits at the extreme right of the line.

Thus, the correct option is: (d)

Q.60 Which of the following properties generally increases across a period (left to right) in the periodic table?

- A. Atomic radius
- B. Ionisation enthalpy
- C. Reduction
- D. Metallic character

Answer: B

Sol:

The correct answer is (b) Ionisation enthalpy

Explanation:

- Effective nuclear charge increases across a period.
- Atomic size decreases from left to right.
- Higher energy required to remove electrons.

Information Booster:

- Ionisation enthalpy measured in kJ/mol.
- Non-metals show higher ionisation enthalpy.

Additional Knowledge (Incorrect Options):

(a) Atomic radius

- Decreases across a period.

(c) Reduction

- Chemical tendency, not periodic property.
- (d) Metallic character
- Decreases across a period.

Q.61 Chara belongs to which of the following plant kingdoms?

- A. Gymnosperms
- B. Angiosperms
- C. Thallophyta
- D. Bryophyta

Answer: C

Sol: Correct Answer: (c)

Explanation:

- **Chara** is a genus of green algae that belongs to the division **Thallophyta**.
- Plants in this group are characterized by a body that is not differentiated into true roots, stems, or leaves; this body is called a **thallus**.
- It is primarily an aquatic plant, found in fresh water, and is often called "stonewort" because it can become encrusted with calcium carbonate.

Information Booster:

- Within the Algae group, Chara belongs to the class **Chlorophyceae** (Green Algae).
- It is unique among algae because it possesses complex multicellular sex organs: the male **antheridium** (globule) and the female **oogonium** (nucule).

Additional Knowledge:

- **Gymnosperms:** These are "naked-seeded" plants where the ovules are not enclosed by an ovary wall. Examples include *Pinus* and *Cycas*.
- **Angiosperms:** These are flowering plants where the seeds are enclosed within fruits. This is the most diverse and dominant group of land plants.
- **Bryophyta:** Known as the "amphibians of the plant kingdom," these plants live in soil but depend on water for sexual reproduction. Examples include *Mosses* and *Liverworts*.

Q.62 What will come in the place of the question mark '?' in the following equation, if '÷' and '×' are interchanged and '+' and '-' are interchanged?

$$11 - 9 \div 2 + 16 \times 8 = ?$$

- A. 27
- B. 28
- C. 26
- D. 25

Answer: A

Sol: Given: $11 - 9 \div 2 + 16 \times 8 = ?$

Given Sign $\div +$

Interchanged Sign $\times -$

Given equation is solve by **BODMAS** rule.

Operation preference wise	Symbol
Brackets	$[], , ()$
Orders, of	$(power), \sqrt{(root), of}$
Division	\div
Multiplication	\times
Addition	$+$
Subtraction	$-$

New equation: $11 + 9 \times 2 - 16 \div 8 = ?$

$$11 + 9 \times 2 - 2 = ?$$

$$11 + 18 - 2 = ?$$

$$29 - 2 = ?$$

$$? = 27$$

Thus, correct option is (a).

Q.63 Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

- A. LGK

- B. HCF
- C. PKO
- D. UPT

Answer: B

Sol:

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Pattern: -5, +4 in alphabetically.

A) LGK

$L(12) \rightarrow G(7) = -5$

$G(7) \rightarrow K(11) = +4$

B) HCF

$H(8) \rightarrow C(3) = -5$

$C(3) \rightarrow F(6) = +3$ X

C) PKO

$P(16) \rightarrow K(11) = -5$

$K(11) \rightarrow O(15) = +4$

D) UPT

$U(21) \rightarrow P(16) = -5$

$P(16) \rightarrow T(20) = +4$

Only option B does not follow -5, +4 pattern.

So, odd one out is: **HCF**

Final Correct Option:

(B)

Q.64 Which sector of the economy is mainly concerned with converting raw materials into finished goods?

- A. Primary sector
- B. Secondary sector
- C. Tertiary sector
- D. Quaternary sector

Answer: B

Sol: The correct answer is **(B) Secondary sector**

Explanation:

- The secondary sector includes industries where finished products are made from natural materials produced in the primary sector.
- It is also called the industrial or manufacturing sector.

Information Booster:

- Examples include steel factories, car manufacturing, and textile mills.

Additional Knowledge:

- Primary sector (Option A): Direct use of natural resources (Agriculture, Mining).
- Tertiary sector (Option C): Service sector (Banking, Tourism).

Q.65 In a certain code language,

A \$ B means 'A is the daughter of B'

A + B means 'A is the brother of B'

A @ B means 'A is the wife of B'

A ÷ B means 'A is the father of B'

Based on the above, how is E related to N if 'E \$ F @ G ÷ M + N'?

- A. Mother
- B. Daughter
- C. Wife
- D. Sister

Answer: D

Sol: Given:

In a certain code language,
A \$ B means 'A is the daughter of B'

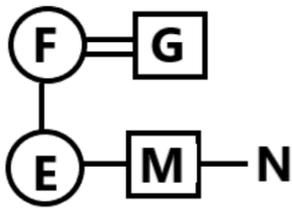
Sign \$ + @ ÷

Relations Daughter Brother Wife Father

Symbol in Diagram	Meaning
- / O	Female
+ / □	Male
=	Married Couple
—	Siblings
	Difference Of Generation

'E \$ F @ G ÷ M + N'?

From the given information relationship diagram will be:



Therefore, E is **sister** of N.
Thus, the correct option is: (d)

Q.66 Solve the system of equations and find the values of three variables.

$$p + q - 3r = -10$$

$$p - q + 2r = 3$$

$$2p + q - r = -6$$

- A. $p = -2, q = 1, r = 3$
- B. $p = 3, q = -2, r = 4$
- C. $p = 2, q = -1, r = 3$
- D. $p = -3, q = 2, r = -4$

Answer: A

Sol: Given:

$$p + q - 3r = -10$$

$$p - q + 2r = 3$$

$$2p + q - r = -6$$

Solution:

$$(p + q - 3r) + (p - q + 2r) = -10 + 3$$

$$2p - r = -7 \quad (A)$$

$$(p + q - 3r) - (2p + q - r) = -10 + 6$$

$$-p - 2r = -4$$

$$p + 2r = 4 \quad (B)$$

$$p = 4 - 2r$$

$$2(4 - 2r) - r = -7$$

$$8 - 5r = -7$$

$$5r = 15$$

$$r = 3$$

$$p = 4 - 6 = -2$$

$$-2 - q + 6 = 3$$

$$4 - q = 3$$

$$q = 1$$

Final Answer:

$$p = -2, q = 1, r = 3$$

Q.67 In a certain code language, 'TAME' is coded as '4257' and 'MIND' is coded as '1365'. What is the code for 'M' in the given code language?

- A. 6
- B. 7
- C. 5
- D. 1

Answer: C

Sol: Given:

In a certain code language, 'TAME' is coded as '4257' and 'MIND' is coded as '1365'.

T A M E = 4 2 5 7

M I N D = 1 3 6 5

So, the missing term is M is 5.

Thus, correct option is (c).

Q.68 Which team won the Fair Play Award in the IPL 2025 season?

- A. Chennai Super Kings
- B. Royal Challengers Bangalore
- C. Mumbai Indians
- D. Punjab Kings

Answer: A

Sol: The correct answer is option (a) Chennai Super Kings.

Explanation

Chennai Super Kings (CSK) won the **Fair Play Award** in the IPL 2025 season, which was a recognition of their exemplary conduct on and off the field. The award, worth **₹10 lakh (US\$12,000)**, was presented to CSK for maintaining the highest level of sportsmanship, discipline, and respect throughout the season. This award is given to the team that showcases the best behavior and fair play during the tournament.

Information Booster

- **Chennai Super Kings (CSK)** won the **Fair Play Award** in IPL 2025.
- The award carried a **prize money of ₹10 lakh (US\$12,000)**.
- CSK was recognized for their high level of **sportsmanship and discipline**.
- The **Fair Play Award** is given to the team that displays the best conduct both on and off the field.
- CSK has a history of being one of the most respected and disciplined teams in the IPL.

Additional Knowledge

- CSK has a longstanding reputation for fair play and discipline, making them one of the most respected franchises in the IPL. Their emphasis on **sportsmanship** and **teamwork** led them to win the **Fair Play Award** in 2025.
- **Royal Challengers Bangalore (RCB) (Option b)**, **Mumbai Indians (MI) (Option c)**, and **Punjab Kings (PBKS) (Option d)** were all competitive teams during the 2025 season, but CSK stood out with its **ethical standards** and consistent conduct, earning them the recognition of the **Fair Play Award**.

Q.69 A television set is sold for ₹Q and the shopkeeper earns a profit of 25%. During a clearance sale, he marks the same set at 1.4Q and allows a discount of 15% on the marked price. What is his profit percentage during the sale?

- A. 45.75%
- B. 40%
- C. 48.75%
- D. 50%

Answer: C

Sol: Given:

Original selling price = Q

Original profit = 25%

Marked price during sale = 1.4Q

Discount = 15%

Formula Used:

$$\text{Cost Price} = \frac{\text{Selling Price}}{1 + \frac{\text{Profit}}{100}}$$

$$\text{Profit \%} = \frac{\text{Profit}}{\text{Cost Price}} \times 100$$

Solution:

$$CP = \frac{Q}{1.25} = 0.8Q$$

$$SP = 1.4Q \times 0.85$$

$$= 1.19Q$$

$$\text{Profit} = 1.19Q - 0.8Q$$

$$= 0.39Q$$

$$\text{Profit \%} = \frac{0.39Q}{0.8Q} \times 100$$

$$= 48.75\%$$

Final Answer

48.75%profit

Q.70 An observer on a cliff 200 m high notices the angles of depression to two ships located on opposite sides as 60° and 30°. Find the distance between the two ships.

- A. $\frac{400}{\sqrt{3}}$ m
- B. $200\sqrt{3}$ m
- C. $\frac{800\sqrt{3}}{3}$ m
- D. $200(\sqrt{3} + 1)$ m

Answer: C

Sol: Given:

Height of the cliff h = 200 m.

Angle of depression to Ship 1 = 60°.

Angle of depression to Ship 2 = 30°.

Ships are on opposite sides of the cliff.

Concept Used:

Heights and distances using trigonometry, alternate interior angles.

Formula Used:

$$\tan \theta = \frac{\text{Perpendicular}}{\text{Base}}$$

Solution:

[Image illustrating an observer on a cliff and the angles of depression to two ships on opposite sides]

Relate angles of depression to angles of elevation.

By alternate interior angles, the angles of elevation from the ships to the cliff top are 60° and 30° respectively.

Find the distance of Ship 1 from the cliff base d_1

$$\tan 60^\circ = \frac{200}{d_1}$$

$$\sqrt{3} = \frac{200}{d_1} \Rightarrow d_1 = \frac{200}{\sqrt{3}}$$

Find the distance of Ship 2 from the cliff base

$$\tan 30^\circ = \frac{200}{d_2}$$

$$\frac{1}{\sqrt{3}} = \frac{200}{d_2} \Rightarrow d_2 = 200\sqrt{3}$$

Calculate the total distance between the ships.

$$\text{Total distance} = d_1 + d_2 = \frac{200}{\sqrt{3}} + 200\sqrt{3}$$

$$\text{Total distance} = \frac{200 + 200(3)}{\sqrt{3}} = \frac{800}{\sqrt{3}}$$

Rationalizing the denominator gives $\frac{800\sqrt{3}}{3}$ m

So the correct answer is (c)

Q.71 Given $a + b + c = 0$, and $a^3 + b^3 + c^3 = 3abc$, evaluate $(a-b)^3 + (b-c)^3 + (c-a)^3$.

- A. 0
- B. $9(a-b)(b-c)(c-a)$
- C. $27abc$
- D. $3(a-b)(b-c)(c-a)$

Answer: D

Sol: Given:

$$a+b+c=0$$

$$a^3 + b^3 + c^3 = 3abc$$

Concept Used:

Algebraic Identity: If $x+y+z=0$, then $x^3 + y^3 + z^3 = 3xyz$.

Solution:

Let $x = (a-b)$, $y = (b-c)$, and $z = (c-a)$.

Check the sum $x + y + z$:

$$(a-b) + (b-c) + (c-a) = a - b + b - c + c - a = 0.$$

Since the sum of the terms inside the cubes is 0, their cubes sum to $3 \times \text{product of terms}$

$$(a-b)^3 + (b-c)^3 + (c-a)^3 = 3(a-b)(b-c)(c-a).$$

Q.72 What should come in place of the question mark (?) in the given series?

1, 2, 4, 8, 10, 20, 22, ?

- A. 44
- B. 42
- C. 26
- D. 24

Answer: A

Sol: Given: 1, 2, 4, 8, 10, 20, 22, ?

Logic: Numbers are multiply by 2 and + 2 alternately.

$$1 \times 2 = 2$$

$$2 + 2 = 4$$

$$4 \times 2 = 8$$

$$8 + 2 = 10$$

$$10 \times 2 = 20$$

$$20 + 2 = 22$$

$$22 \times 2 = \mathbf{44}$$

So, the missing term is **44**.

Thus, correct option is (a).

Q.73 A can do a work in 20 days and B in 30 days. With the help of C, they finish the work in 10 days. If the total wage is ₹600, what is C's share?

- A. ₹100
- B. ₹200
- C. ₹300
- D. ₹50

Answer: A

Sol: Given:

Time A = 20 days, Time B = 30 days.

Time (A+B+C) = 10 days.

Total Wage = ₹600.

Solution:

$$\text{Work done by A in 10 days} = \frac{10}{20} = \frac{1}{2}$$

$$\text{Work done by B in 10 days} = \frac{10}{30} = \frac{1}{3}$$

$$\begin{aligned} \text{Remaining work (done by C)} &= 1 - \left(\frac{1}{2} + \frac{1}{3}\right) \\ &= 1 - \frac{5}{6} \\ &= \frac{1}{6} \end{aligned}$$

$$\text{C's Share} = \frac{1}{6} \times 600 = ₹100$$

Final Answer

So the correct answer is (a)

Q.74 What is the median of the following distribution?

Class 150-200 200-250 250-300 300-350 350-400

Frequency 20 19 32 27 12

- A. 261
- B. 286
- C. 293
- D. 275

Answer: D

Sol: Given:

Classes and frequencies are provided.

Formula Used:

$$\text{Median} = l + \left(\frac{\frac{N}{2} - c_f}{f}\right) \times h$$

Solution:

$$N = 20 + 19 + 32 + 27 + 12 = 110$$

$$\frac{N}{2} = 55$$

Cumulative frequencies:

20, 39, 71

Median class = 250 – 300

$l = 250, c_f = 39, f = 32, h = 50$

$$\text{Median} = 250 + \left(\frac{55 - 39}{32}\right) \times 50$$

$$= 250 + \frac{16}{32} \times 50$$

$$= 250 + 25$$

$$= 275$$

Final Answer:

275

Q.75 What is the allocation for Deendayal Antyodaya Yojana – National Rural Livelihoods (DAY-NRLM) in Union Budget 2026-27?

- A. Rs 16,000 crore
- B. Rs 19,200 crore
- C. Rs 95,692 crore
- D. Rs 67,670 crore

Answer: B

Sol: The correct answer is (b) Rs 19,200 crore

Explanation:

- . Union Budget 2026-27 allocates Rs 19,200 crore to Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM).
- . This is a marginal increase over Rs 19,005 crore in Budget Estimates 2025-26.
- . The allocation is higher than the Revised Estimates of Rs 16,000 crore.
- . The scheme focuses on promoting sustainable livelihoods for rural poor households.
- . Special emphasis is placed on women-led Self-Help Groups (SHGs).

Information Booster:

- . DAY-NRLM supports nearly 10 crore rural women through SHGs.
- . Around 90.9 lakh SHGs have been mobilised under the mission.
- . Credit disbursement of about Rs 11 lakh crore has been facilitated to women SHGs.
- . The scheme converges with PMAY-G and Jal Jeevan Mission for holistic rural development.
- . A special allocation of about Rs 1,920 crore is earmarked for the North-Eastern states.

Q.76 Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

- All parks are meadows.
- All meadows are forests.
- Some forests are gardens.

Conclusions:

- (I): Some parks are gardens.
- (II): Some meadows are gardens.

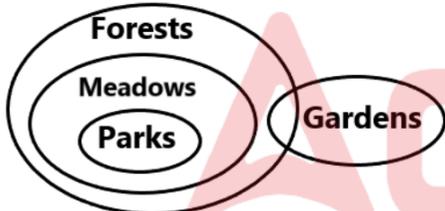
- A. Neither conclusion I nor II follows
- B. Both conclusions I and II follow
- C. Only conclusion I follows
- D. Only conclusion II follows

Answer: A

Sol: Statements:

- All parks are meadows.
- All meadows are forests.
- Some forests are gardens.

According to the given information, Venn diagram will be:



Analyze the conclusions:

Conclusions:

- (I): Some parks are gardens. → **False**
It's possible but not certain that those "some gardens" include parks.
 - (II): Some meadows are gardens. → **False**
It's possible but not definite that meadows overlap with gardens.
- Thus, the correct option is **(A) Neither conclusion I nor II follows.**

Q.77 When light travels from air to glass, what happens to its speed?

- A. Increases
- B. Decreases
- C. Remains same
- D. Becomes zero

Answer: B

Sol: The correct answer is **(B) Decreases**

Explanation:

- Light travels at its maximum speed in a vacuum (approximately 3×10^8 m/s) and slightly slower in air.
- When light enters a denser medium like glass, it interacts with the atoms of the medium, which causes its effective speed to **decrease**.
- This change in speed when light moves from one medium to another is the fundamental cause of **refraction** (the bending of light).
- The extent to which speed decreases is determined by the refractive index (n) of the medium ($n = c/v$).

Information Booster:

- **Refractive Index:** The refractive index of glass is typically around 1.5, meaning light travels 1.5 times slower in glass than in a vacuum.
- **Frequency:** When light changes medium, its **speed and wavelength change**, but its **frequency remains constant**.
- **Bending:** When light travels from a rarer medium (air) to a denser medium (glass), it bends towards the normal.

Additional Knowledge:

- **Increases (Option A):** This would happen if light moved from a denser medium (like water) to a rarer medium (like air).
- **Remains same (Option C):** Speed only remains the same if the refractive indices of both media are identical.
- **Becomes zero (Option D):** Light does not stop; it is either transmitted, reflected, or absorbed. If it were zero, the material would be perfectly opaque and non-interactive in a way that 'stops' light entirely, which isn't the case for glass.

Q.78 Wuchereria, the filarial worms are the cause of:

- A. Ringworms
- B. Amoebiasis
- C. Elephantiasis
- D. Malaria

Answer: C

Sol: The correct answer is (c) Elephantiasis

Explanation:

- Elephantiasis (Lymphatic Filariasis) is caused by filarial worms like Wuchereria bancrofti.
- It is transmitted by mosquito bites and results in extreme swelling of limbs.

Information Booster:

- The worms live in the human lymphatic system.
- WHO target is to eliminate Lymphatic Filariasis as a public health problem.

Additional Knowledge:

- Ringworm – Fungal infection.
- Amoebiasis – Protozoan infection.
- Malaria – Caused by Plasmodium (Protozoa), transmitted by female Anopheles mosquito.

Q.79 Two workers, A and B, working together can complete a task in 14 days. A alone can complete the same task in 24 days. They start the work together, but after 5 days, A falls sick and B completes the remaining work alone. In how many total days was the work completed?

- A. 23.8
- B. 25.6
- C. 26.6
- D. 22.5

Answer: C

Sol: Given

Time (A + B) = 14 days

Time (A) = 24 days

Solution

Let Total Work = LCM(14, 24) = 168 units.

Efficiency (A + B) = $168 / 14 = 12$ units/day

Efficiency (A) = $168 / 24 = 7$ units/day

Efficiency (B) = $12 - 7 = 5$ units/day

Work done in first 5 days (A + B) = $12 \times 5 = 60$ units.

Remaining work = $168 - 60 = 108$ units.

Time for B to finish remaining work = $108 / 5 = 21.6$ days.

Total Time = $5 + 21.6 = 26.6$ days.

Final Answer

So the correct answer is (c)

Q.80 If 1 is added to each even digit and each odd digit in the number 57831426, what will be the sum of the first two and the last two digits from the left in the new number thus formed?

- A. 26
- B. 20
- C. 24
- D. 22

Answer: C

Sol: Given Number: 57831426

Rule: Add 1 to each even digit and each odd digit.

Original: 5 7 8 3 1 4 2 6

New: 6 8 9 4 2 5 3 7

First two digits: **6 + 8 = 14**

Last two digits: **3 + 7 = 10**

Total sum = **14 + 10 = 24**

Thus, the correct option is: (c)

Q.81 There are 80 students in a hostel. Due to new admissions, 30 new students join the mess, and the daily expense of the mess increases by ₹260, while the average expenditure per head diminishes by ₹10. What was the original daily expenditure (in ₹, rounded off to the nearest tens) of the mess?

- A. 3,720
- B. 3,630
- C. 4,020
- D. 4,220

Answer: B

Sol: Given:

Original students = 80

New students = 30 → Total = 110

Increase in total expense = ₹260

Average expense per head decreases by ₹10

Formula Used:

Average = Total expense ÷ Number of students.

Solution:

Let original average expense per head = x.

Then original total expense = 80x

$$\frac{80x + 260}{110} = x - 10$$

$$80x + 260 = 110(x - 10)$$

$$80x + 260 = 110x - 1100$$

$$260 + 1100 = 110x - 80x$$

$$1360 = 30x$$

$$x = \frac{1360}{30} = 45.33$$

Original total daily expenditure:

$$80x = 80 \times 45.33 = 3626.4$$

Rounded off to nearest tens:

₹3630

Q.82 When 12, 15, 18, 20 and 25 divide the least number x, the remainder in each case was 3 but x was divisible by 7. What is the value of x?

- A. 390
- B. 930
- C. 903
- D. 309

Answer: C

Sol: Given:

When x is divided by 12, 15, 18, 20, and 25, the remainder in each case is 3.

x is divisible by 7.

Formula Used:

If a number x leaves the same remainder r when divided by several numbers, then:

$$x = \text{LCM}(a, b, c, \dots) \times k + r$$

where k is a positive integer.

Solution:

LCM of 12, 15, 18, 20, and 25

Prime factorization of the numbers:

$$12 = 2^2 \times 3^1, \quad 15 = 3^1 \times 5^1, \quad 18 = 2^1 \times 3^2, \quad 20 = 2^2 \times 5^1, \quad 25 = 5^2$$

$$\text{LCM}(12, 15, 18, 20, 25) = 2^2 \times 3^2 \times 5^2 = 4 \times 9 \times 25 = 900$$

$$\text{So, } x = 900k + 3$$

Checking divisibility by 7

$$x = 900k + 3 \text{ to be divisible by 7.}$$

Putting $k = 1, 2, 3, \dots$

For $k = 1$

$$= 900(1) + 3 = 903 \text{ divisible by 7}$$

So, the least number which satisfy the given condition is 903.

Q.83 When burned in air, a magnesium strip burns with a bright _____ flame.

- A. Green
- B. White
- C. Red
- D. Blue

Answer: B

Sol: Correct Answer: (B) White

Explanation:

- When **magnesium** is burned in air, it reacts vigorously with oxygen.
- It produces a **bright white flame**, which is characteristic of burning magnesium.
- The reaction forms **magnesium oxide (MgO)** as a white powder.

Information Booster:

- Magnesium is often used in **fireworks, flares, and flash photography** due to its intense white light.
- The reaction is highly exothermic.
- The equation for the reaction:
Magnesium + Oxygen → Magnesium Oxide

Q.84 If $x + y = 7$ and $xy = 10$, find: $(x^3 + y^3)^2 - 9x^2y^2(x + y)^2$

- A. 24011
- B. -26411
- C. 12255
- D. -12251

Answer: B

Sol: Given:

$$x + y = 7$$

$$xy = 10$$

Formula Used:

$$x^3 + y^3 = (x + y)^3 - 3xy(x + y)$$

Solution:

$$x^3 + y^3 = 7^3 - 3(10)(7)$$

$$= 343 - 210$$

$$= 133$$

$$(x^3 + y^3)^2 = 133^2$$

$$= 17689$$

$$9x^2y^2(x + y)^2 = 9(10^2)(7^2)$$

$$= 9(100)(49)$$

$$= 44100$$

$$\text{Required expression} = 17689 - 44100$$

$$= -26411$$

Final Answer:

$$-26411$$

Q.85 What is the specific heat of copper, which is often used for pots and pans because it heats up quickly?

- A. 604.2 J kg⁻¹ K⁻¹
- B. 239.3 J kg⁻¹ K⁻¹
- C. 712.1 J kg⁻¹ K⁻¹
- D. 386.4 J kg⁻¹ K⁻¹

Answer: D

Sol:

The correct answer is (d) 386.4 J kg⁻¹ K⁻¹

Explanation:

- Copper has a specific heat capacity of 386.4 J kg⁻¹ K⁻¹, meaning it requires relatively little heat energy to rise in temperature.
- This property allows copper utensils to heat up rapidly, making them ideal for cooking.
- Low specific heat ensures faster thermal response compared to metals like iron or aluminium.

Information Booster:

- Copper is also an excellent thermal conductor, further increasing its efficiency for cookware.
- Materials with low specific heat and high conductivity are preferred in professional kitchens.

Additional Knowledge:

- Option (a) and (c) are too high for copper's specific heat capacity.
- Option (b) 239.3 J kg⁻¹ K⁻¹ is close to aluminium's value, not copper's.
- Metals with lower specific heat get hot faster, which is why copper is widely used.

Q.86 Which of the following is a feature of the State Legislative Council (Vidhan Parishad) in India?

- A. The people directly elect their members
- B. It has a fixed term of five years
- C. It can be dissolved like the Legislative Assembly
- D. It is a permanent body and cannot be dissolved

Answer: D

Sol: The correct answer is **(D) It is a permanent body and cannot be dissolved**

Explanation:

- Similar to the Rajya Sabha, the State Legislative Council is a permanent chamber.
- One-third of its members retire every second year.

Information Booster:

- Not all Indian states have a Legislative Council; it is currently present in only 6 states (UP, Bihar, Maharashtra, Karnataka, AP, and Telangana).

Additional Knowledge:

- Direct Election (Option A): Members are indirectly elected by local bodies, graduates, teachers, and MLAs.
- Fixed term (Option B): While the body is permanent, individual members have a term of 6 years.

Q.87 What is the relation between the speed of sound $\{v\}$, its wavelength $\{\lambda\}$ and time period $\{T\}$?

- A. $\{v = \lambda \times T\}$
- B. $\{v = \lambda / T\}$
- C. $\{v = T / \lambda\}$
- D. $\{v = \lambda + T\}$

Answer: B

Sol:

The correct answer is (b) $\{v = \lambda / T\}$

Explanation:

- Speed is defined as distance divided by time. In wave mechanics, the distance covered in one cycle is the wavelength $\{\lambda\}$.
- The time taken for one complete cycle is the time period $\{T\}$.
- Therefore, the formula for speed is $\{v = \lambda / T\}$.

Information Booster:

- Since frequency $\{f\}$ is the reciprocal of the time period $\{f = 1/T\}$, the formula can also be written as $\{v = f \times \lambda\}$.
- In a given medium under constant physical conditions, the speed of sound remains constant for all frequencies.

Additional Knowledge:

- The speed of sound is highest in solids and lowest in gases.
- Sound waves are longitudinal waves, meaning particles of the medium vibrate parallel to the direction of wave travel.

Q.88 Which of the following elements is used as a doping agent in semiconductors for solid state devices?

- A. Lithium
- B. Nitrogen
- C. Neon
- D. Arsenic

Answer: D

Sol: The correct answer is **(d) Arsenic**

Explanation:

- **Arsenic** is commonly used as a **doping agent** in semiconductors like **silicon** to create **n-type semiconductors**.
- Doping introduces **impurities** that increase the **number of charge carriers**, enhancing the material's **electrical conductivity**.
- Arsenic adds extra **electrons** to the silicon lattice, making it negatively charged (n-type).

Information Booster:

- **N-type semiconductors** have electrons as the **majority carriers**.
- **P-type semiconductors** are doped with elements like **boron**, which create **holes** as majority carriers.
- Doping is crucial for **transistors, diodes, and integrated circuits**.
- Other n-type dopants include **phosphorus and antimony**.
- Semiconductor doping controls the **electrical properties** essential for **solid-state devices**.

Q.89 A shopkeeper marks his products 50% above the cost price and allows a discount of 20% on the marked price. He also gives an additional cash discount of ₹120 and still makes a profit of 16% on cost. What is the cost price of the product?

- A. ₹1,800
- B. ₹3,000
- C. ₹2,200
- D. ₹2,400

Answer: B

Sol: Given:

Marked Price (MP) = 50% above Cost Price (CP)

Discount = 20% on MP

Additional cash discount = ₹120

Final Profit = 16% on CP

Find Cost Price (CP)

Formula Used:

$$MP = CP \times (1 + \text{Markup}\%)$$

$$\text{Selling Price (SP)} = MP \times (1 - \text{Discount}\%) - \text{Cash Discount}$$

$$\text{Profit}\% = \frac{SP - CP}{CP} \times 100$$

Solution:

Let Cost Price = ₹x

Marked Price = 1.5x

After 20% discount:
 $SP_1 = 1.5x \times 0.8 = 1.2x$

After additional ₹120 discount:
Final SP = $1.2x - 120$

Given profit = 16%

So, Final SP = 1.16x

Therefore,

$$1.2x - 120 = 1.16x$$

$$0.04x = 120$$

$$x = 3000$$

Cost Price = ₹3000

Q.90 A body increases its velocity from 10 m/s to 30 m/s in 4 seconds under uniform acceleration. What is the acceleration?

- A. 2 m/s²
- B. 4 m/s²

- C. 5 m/s^2
- D. 10 m/s^2

Answer: C

Sol: The correct answer is **(C) 5 m/s^2**

Explanation:

- Acceleration is defined as the rate of change of velocity with respect to time.
- The formula for uniform acceleration is $a = \frac{v - u}{t}$, where 'v' is the final velocity, 'u' is the initial velocity, and 't' is the time interval.
- Given: Initial velocity (u) = 10 m/s, Final velocity (v) = 30 m/s, Time (t) = 4 seconds.
- Calculation: $a = \frac{30 - 10}{4} = \frac{20}{4} = 5 \text{ m/s}^2$.

Information Booster:

- **SI Unit:** The standard unit for acceleration is meters per second squared (m/s^2).
- **Vector Quantity:** Acceleration has both magnitude and direction. If the velocity decreases, it is termed as deceleration or retardation (negative acceleration).
- **Equations of Motion:** This calculation is based on the first equation of motion: $v = u + at$.

Additional Knowledge:

- **Option A (2 m/s^2):** Incorrect; this would only result in a velocity increase of 8 m/s over 4 seconds ($10 + 8 = 18$).
- **Option B (4 m/s^2):** Incorrect; this would result in a velocity of 26 m/s after 4 seconds.
- **Option D (10 m/s^2):** Incorrect; this represents the approximate acceleration due to gravity ($g \approx 9.8 \text{ m/s}^2$), which would make the velocity 50 m/s after 4 seconds.

Q.91 Which of the following is NOT a thermometric property?

- A. Pressure of a gas
- B. Colour of a substance
- C. Electrical resistance
- D. Length of a metal rod

Answer: B

Sol: The correct answer is **(B) Colour of a substance**

Explanation:

- A **thermometric property** is any physical property that changes **uniformly and measurably with temperature** and can be used to construct a thermometer.
- **Colour** of a substance does not change predictably or uniformly with temperature and **cannot be used for accurate temperature measurement**, so it is *not* a thermometric property.

Information Booster:

Common thermometric properties include:

- **Pressure of a gas** (used in gas thermometers)
- **Electrical resistance** (used in resistance thermometers, RTDs)
- **Length of a metal rod** (basis of mercury and alcohol thermometers—thermal expansion)

Q.92 Find the value of $(0.02^3 + 0.002^3) \div (0.04^3 + 0.004^3)$

- A. $1/2$
- B. $1/4$
- C. $1/8$
- D. $1/16$

Answer: C

Sol: Given:

Expression: $(0.02^3 + 0.002^3) \div (0.04^3 + 0.004^3)$

Formula Used:

$$(kx)^3 = k^3 x^3$$

Solution:

Observe that each term in the denominator is exactly 2 times the corresponding term in the numerator.

$$0.04 = 2 \times 0.02$$

$$0.004 = 2 \times 0.002$$

Rewrite the denominator.

$$\text{Denominator} = (2 \times 0.02)^3 + (2 \times 0.002)^3$$

$$= 2^3(0.02^3) + 2^3(0.002^3)$$

$$= 8(0.02^3 + 0.002^3)$$

Substitute and simplify.

$$\frac{0.02^3 + 0.002^3}{8(0.02^3 + 0.002^3)} = \frac{1}{8}$$

So the correct answer is (c)

Q.93 Simplify: $(0.12^3 + 0.04^3) \div (0.36^3 + 0.12^3)$

- A. 1/3
- B. 1/9
- C. 1/27
- D. 1/81

Answer: C

Sol: Given:

$$\text{Expression: } (0.12^3 + 0.04^3) \div (0.36^3 + 0.12^3)$$

Formula Used:

$$(kx)^3 = k^3x^3$$

Solution:

Notice that each term in the denominator is exactly 3 times the corresponding term in the numerator.

$$0.36 = 3 \times 0.12$$

$$0.12 = 3 \times 0.04$$

Rewrite the denominator.

$$\text{Denominator} = (3 \times 0.12)^3 + (3 \times 0.04)^3$$

$$= 3^3(0.12^3) + 3^3(0.04^3)$$

$$= 27(0.12^3 + 0.04^3)$$

Substitute and simplify.

$$\frac{0.12^3 + 0.04^3}{27(0.12^3 + 0.04^3)} = \frac{1}{27}$$

So the correct answer is (c)

Q.94 Match the dance–state:

1. Bihu – Assam
2. Ghoomar – Rajasthan
3. Lavni – Maharashtra
4. Yakshagana – Karnataka

- A. All correct
- B. 1,2,3 only
- C. 2,3,4 only
- D. 1,3,4 only

Answer: A

Sol: The correct answer is **(A) All correct**

Explanation:

- **Bihu:** The most popular folk dance of Assam, performed during the Bihu festivals by both men and women.
- **Ghoomar:** A traditional folk dance of Rajasthan, performed by women in swirling robes, originally developed by the Bhil tribe.
- **Lavni:** A combination of traditional song and dance from Maharashtra, particularly noted for its powerful rhythm and performed to the beats of the *Dholki*.
- **Yakshagana:** A traditional theater form from Karnataka that combines dance, music, dialogue, costume, and stage techniques with a unique style and form.

Information Booster:

- **Sattriya:** The classical dance form of Assam (distinct from the folk Bihu).
- **Kalbelia:** Another famous UNESCO-recognized folk dance from Rajasthan.

Additional Knowledge:

- Understanding the difference between **Classical Dances** (recognized by Sangeet Natak Akademi, currently 8 or 9) and **Folk Dances** (diverse regional forms) is crucial for GS preparation. All four listed here are iconic representatives of their respective states.

Q.95 A question is followed by two statements numbered I and II. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the most appropriate answer.

Five boxes A, D, F, L, and R are of different weights. How many boxes are heavier than F?

(I) Only A is lighter than L. Only R is heavier than F.

(II) Exactly two boxes are heavier than D. A is lighter than R.

- A. Both statements I and II together are NOT sufficient to answer the question
 B. Data in Statement I alone is sufficient to answer the question while data in statement II is not
 C. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
 D. Data in Statement II alone is sufficient to answer the question while data in statement I is not

Answer: B

Sol: Given: Boxes: A, D, F, L, R, all of different weights.

Statement (I) Only A is lighter than L. Only R is heavier than F.

As per the statement →

$R > F > D > L > A$

Boxes are heavier than F is only R.

So, Statement I alone is sufficient.

Statement (II) Exactly two boxes are heavier than D. A is lighter than R.

As per the statement →

Exactly two boxes are heavier than D. A is lighter than R.

"Exactly two boxes heavier than D" → D is 3rd heaviest.

$A < R$, but no relation of F with others is fixed.

Different possible orders give different counts for boxes heavier than F.

So we cannot uniquely determine how many are heavier than F.

So, Statement II alone is NOT sufficient.

Thus, the correct option is **(B) Data in Statement I alone is sufficient to answer the question while data in statement II is not.**

Q.96 Match the Scientific Law with its Propounder:

- A. Law of Constant Proportions - 1. Joseph Proust
 B. Law of Multiple Proportions - 2. John Dalton
 C. Law of Conservation of Mass - 3. Antoine Lavoisier

- A. A-1, B-2, C-3
 B. A-2, B-1, C-3
 C. A-3, B-2, C-1
 D. A-1, B-3, C-2

Answer: A

Sol: The correct answer is **(A) A-1, B-2, C-3**

Explanation:

- **Law of Constant Proportions (A-1):** Proposed by Joseph Proust in 1794. It states that a chemical compound always contains exactly the same proportion of elements by mass, regardless of its source or method of preparation.
- **Law of Multiple Proportions (B-2):** Proposed by John Dalton in 1803. It states that if two elements form more than one compound between them, then the ratios of the masses of the second element which combine with a fixed mass of the first element will be ratios of small whole numbers.
- **Law of Conservation of Mass (C-3):** Proposed by Antoine Lavoisier in 1789. It states that mass is neither created nor destroyed in a chemical reaction; the total mass of reactants equals the total mass of products.

Information Booster:

- **Antoine Lavoisier:** Often referred to as the 'Father of Modern Chemistry' for his meticulous weighing experiments.
- **John Dalton:** Also famous for his Atomic Theory, which provided a physical explanation for these chemical laws.
- **Gay-Lussac's Law of Gaseous Volumes:** Another fundamental law stating that when gases react, they do so in volumes which bear a simple ratio to one another.

Additional Knowledge:

- **Joseph Proust (Option A):** His work was contested by Claude Berthollet, but Proust's meticulous experiments with copper carbonate eventually

proved him correct.

- **Dalton's Atomic Theory:** Postulated that atoms of different elements combine in simple whole-number ratios to form compounds.
- **Avogadro's Law:** States that equal volumes of all gases, at the same temperature and pressure, have the same number of molecules.

Q.97 Find the discriminant of the quadratic equation $3x^2 - 4x + 2 = 0$, and hence determine the nature of its roots.

- A. Discriminant = -8 , roots are imaginary
 B. Discriminant = 8 , roots are real and equal
 C. Discriminant = -8 , roots are real and distinct
 D. Discriminant = 8 , roots are real and distinct

Answer: A

Sol: Given:

Quadratic equation:
 $3x^2 - 4x + 2 = 0$

Formula Used:

The discriminant of a quadratic equation $ax^2 + bx + c = 0$ is given by:

$$D = b^2 - 4ac$$

If ($D > 0$): Roots are real and unequal

If ($D = 0$): Roots are real and equal

If ($D < 0$): Roots are imaginary (complex conjugates)

Solution:

$$D = (-4)^2 - 4(3)(2)$$

$$D = 16 - 24 = -8$$

Nature of Roots:

Since ($D < 0$), the roots are non-real (imaginary and distinct).

Answer: Discriminant = -8 , Nature of roots = Imaginary (non-real and unequal)

Q.98 In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the most appropriate answer.

Question:

Among 5 students, F, A, K, E and D each having a different height, which student is the shortest?

Statements:

- I. A is shorter than E. K is shorter than F.
 II. K is taller than A.

- A. Data in statement I alone is sufficient to answer the question while data in statement II is not
 B. Data in statements I and II together are NOT sufficient to answer the question
 C. Data in statement II alone is sufficient to answer the question while data in statement I is not
 D. Data in statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question

Answer: B

Sol: Question:

Among 5 students, F, A, K, E and D each having a different height, which student is the shortest?

Statements:

- I. A is shorter than E. K is shorter than F. (**Not sufficient**)
 $A < E$ and $K < F$

We know only two partial comparisons, and nothing about D. We can't determine who is shortest.

II. K is taller than A. **(Not sufficient)**

$K > A$

Only one comparison. We still don't know about F, E, or D.

Combining (I) and (II):

From (I): $A < E, K < F$

From (II): $K > A \rightarrow$ So order among A, K, F, E (partial) is:

$A < K < F$ and $A < E$

D is still unrelated.

We still can't find the shortest, because D's height is unknown. Even together, not sufficient.

So, **Data in statements I and II together are NOT sufficient to answer the question.**

Thus, correct option is (b).

Q.99 Rishabh starts from Point A and drives 9 km towards west. He then takes a left turn, drives 8 km, turns left and drives 15 km. He then takes a right turn and drives 6 km. He takes a final right turn, drives 6 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

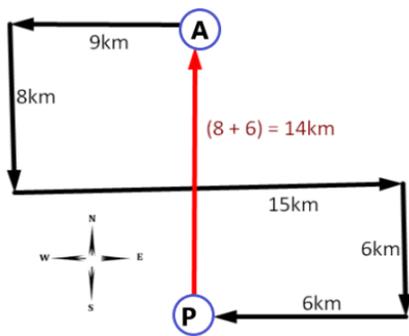
- A. 16 km towards east
- B. 14 km towards north
- C. 16 km towards west
- D. 14 km towards south

Answer: B

Sol: Given:

Rishabh starts from Point A and drives 9 km towards west.
He then takes a left turn, drives 8 km, turns left and drives 15 km.
He then takes a right turn and drives 6 km.
He takes a final right turn, drives 6 km and stops at Point P.

From the given information path diagram will be:



So, he drive **14 km towards north** to reach Point A again.

Thus, the correct option is: (b)

Q.100 If $p : q = 4 : 5$, then find $(8p + 3q) : (8p - 3q)$.

- A. 47 : 17
- B. 21 : 37
- C. 15 : 33
- D. 3 : 5

Answer: A

Sol: Given:

$$\frac{p}{q} = \frac{4}{5}$$

Solution:

Let $p = 4x$ and $q = 5x$.

$$\text{Required Ratio} = \frac{8p + 3q}{8p - 3q}$$

$$= \frac{8(4x) + 3(5x)}{8(4x) - 3(5x)}$$

$$= \frac{32x + 15x}{32x - 15x}$$

$$= \frac{47x}{17x} = \frac{47}{17}$$

Final Answer

47 : 17

