RRB NTPC Graduate Level CBT-I Official Paper (Held On: 12 Jun, 2025 Shift 2) (Previous Year Paper)

RRB Group D • 2025 • 100 questions • 90 minutes • Answer key and solutions

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Q1. D, E, F, G, M, N and O are sitting around a circular table, facing the centre of the table. Only E sits between N and M. M sits third to the left of O. G sits to the immediate left of O. D is not an immediate neighbour of M. Who sits third to the left of F?

(a) D
(b) N
(c) M
(d) E

Q2. On selling a stool for Rs. 8,378, the value of gain is 20% more than the value of loss incurred on selling it for Rs. 1,756. In order to gain 50%, find the selling price (in Rs.).

(a) 7,151
(b) 7,149
(c) 7,150
(d) 7,148

Q3. In March 2025, which region was announced as the site for the world’s first high-altitude para sports centre to boost preparations for the 2028 Paralympics?

(a) Auli, Uttarakhand
(b) Leh, Ladakh
(c) Kargil, Ladakh
(d) Manali, Himachal Pradesh

Q4. Two positive numbers differ by 2134. When the greater number is divided by the smaller number, the quotient is 2 and the remainder is 147. What is the HCF of the greater of the two given numbers and 4225?

(a) 16
(b) 13
(c) 11
(d) 10

Q5. A rectangular tin sheet is 32 cm long and 14 cm wide. It is rolled along its length to form a cylinder, with opposite edges just touching each other. Find the volume (in cm^3) of the cylinder.

(a) 3585/π
(b) 3584/π
(c) 3588/π
(d) 3582/π

Q6. Which Article of the Constitution of India prevents any child below the age of 14 years from being employed in the factory, mine or hazardous occupation?

(a) Article 21
(b) Article 23
(c) Article 24
(d) Article 19

Q7. A person who spends 50% of his monthly income is able to save Rs. 7,056 per month. His monthly expenses (in Rs.) are:

(a) 7,056
(b) 6,987
(c) 7,039
(d) 7,024

Q8. The 'Drain of Wealth' theory, which highlighted the economic exploitation of India under British rule, was prominently advocated by whom?

(a) Gopal Krishna Gokhale
(b) Bipin Chandra Pal
(c) Lala Lajpat Rai
(d) Dadabhai Naoroji

Q9. In October 2024, the Mediation Act, 2023 came into force. What is a key feature introduced by this legislation?

(a) It replaces arbitration and conciliation with mediation as the sole dispute resolution method.
(b) It mandates that all mediation proceedings must be conducted only by retired judges.
(c) It abolishes the role of mediators in public sector disputes.
(d) It makes mediation compulsory for all civil and commercial disputes before court proceedings.

Q10. Which version of Windows introduced the Start menu?

(a) Windows 10
(b) Windows 7
(c) Windows 95
(d) Windows XP

Q11. Simplify: $(3z - 9y)^2 + (9z + 3y)^2 - 81z^2$

(a) $3z^2 + 81y^2$
(b) $18z^2 + 91y^2$
(c) $7z^2 + 95y^2$
(d) $9z^2 + 90y^2$

Q12. In a certain code language,

'A + B' means 'A is the sister 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 M related to Q if 'M ÷ N × O − P + Q'?

(a) Wife's Brother
(b) Brother's Wife's Father
(c) Brother's Wife's Brother
(d) Wife's Father

Q13. Which of the following letter-number-clusters will replace the question mark (?) in the given series to make it logically complete?

VRO 6, UQN 11, TPM 16, SOL 21, ?

(a) PRN 26
(b) RNK 26
(c) PQM 25
(d) RPM 25

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Q14. If 20% of k is 10 less than 1200% of 10, then k is:

(a) 550
(b) 530
(c) 590
(d) 510

Q15. The Palk Strait separates India from which of the following countries?

(a) Bangladesh
(b) Myanmar
(c) Maldives
(d) Sri Lanka

Q16. Which of the following was the final court of appeal for India under British rule?

(a) Federal Court
(b) House of Commons
(c) Supreme Court at Calcutta
(d) Privy Council in London

Q17. Which file format is used for saving MS PowerPoint templates?

(a) .ppmx
(b) .potx
(c) .pptx
(d) .ppsx

Q18. What type of majority is required to pass laws under Articles 2 and 3, as per Article 4(2) in Indian parliament?

(a) State ratification
(b) Two-thirds majority
(c) Simple majority
(d) Special majority

Q19. Where was the World Economic Forum Annual Meeting held in January 2025?

(a) Zurich, Switzerland
(b) Davos, Switzerland
(c) Basel, Switzerland
(d) Geneva, Switzerland

Q20. 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 letter-cluster pair 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) BT – GK
(b) DV – IN
(c) IA – NR
(d) KC – PT

Q21. M, N, O, P, Y and Z live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. Only three people live between Y and Z, where Y lives below Z. P lives on an odd numbered floor and immediately above Y. O lives on one of the floors below M and on one of the floors above N. Who lives on floor numbered 4?

(a) O
(b) P
(c) M
(d) Z

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Q22. A tap fills a cistern in 9 hours. Another tap empties the full tank in 90 hours. How long (in hours) will it take to fill twice the volume of the tank, if the tank is empty initially and both the taps are open together?

(a) 10
(b) 20
(c) 15
(d) 5

Q23. Gopal bought 51 books at Rs. 1,120 per book from one shop and 45 books at Rs. 920 per book from another. What is the average price (in Rs.) he paid per book?

(a) 1,016.25
(b) 1,036.25
(c) 1,026.25
(d) 1,041.25

Q24. What should come in place of the question mark (?) in the given series?

43 27 43 41 43 55 43 ?

(a) 43
(b) 77
(c) 69
(d) 73

Q25. The average weight of 7 boys of a group is 54 kg. When a new boy joined the group, the average weight increased by 2 kg. Find the weight of the new boy.

(a) 70 kg
(b) 72 kg
(c) 77 kg
(d) 74 kg

Q26. According to NITI Aayog, what was the reduction in the Poverty Headcount Ratio in India from 2013-14 to 2022-23?

(a) From 29.17% to 11.28%
(b) From 28% to 15%
(c) From 30% to 12.5%
(d) From 25% to 10%

Q27. Which bacterial disease is specifically confirmed by a serological method?

(a) Plague
(b) Diphtheria
(c) Typhoid
(d) Pneumonia

Q28. What is the third proportional of $2x^2$ and $12xy$?

(a) $72y^2$
(b) $71y^2$
(c) $74y^2$
(d) $73y^2$

Q29. A vendor buys 42 laptop bags for Rs. 41,622 and sells them at 35 for Rs. 37,345. How many laptop bags should be bought and sold to earn a profit of Rs. 3,952?

(a) 16
(b) 52
(c) 76
(d) 34

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Q30. Samudrayaan, scheduled for 2026, involves which of the following?

(a) Testing ocean-based launch platforms
(b) Launching underwater satellites
(c) Sending scientists 6,000 meters underwater
(d) Deep-sea mining using robots

Q31. What will come in the place of '?' in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged? 41 ÷ 19 + 448 × 4 − 26 = ?

(a) 699
(b) 691
(c) 693
(d) 696

Q32. The work 'Snowmelt Runoff Forecasting in Himalayan River Basin' has been taken up by the Central Water Commission (CWC) in association with _____.

(a) Indian Council of Agricultural Research
(b) National Remote Sensing Centre
(c) Indian Space Research Organisation
(d) Central Pollution Control Board

Q33. If sin ^4θ - cos ^4θ = 1/2, find the value of $2\sin^2\theta - 1$.

(a) 1
(b) 1/2
(c) 1/√2
(d) √3/2

Q34. 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:
Some trees are flowers.
All flowers are beautiful.
Some beautiful are girls.
Conclusions:
(I) Some flowers are trees.
(II) Some beautiful are flowers

(a) Only conclusion (II) follows.
(b) Both conclusions (I) and (II) follow.
(c) Neither conclusion (I) nor (II) follows.
(d) Only conclusion (I) follows.

Q35. What should come in place of the question mark (?) in the given series?

962 960 956 950 942 ?

(a) 932
(b) 936
(c) 934
(d) 930

Q36. The product of two consecutive positive integers is 247. If the smaller of these two integers is represented by x, which of the following will correspond to the equation for finding out the value of x?

(a) $x^2 - x - 247 = 0$
(b) $x^2 - x + 247 = 0$

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(c) $x^2 + x + 247 = 0$
(d) $x^2 + x - 247 = 0$

Q37. Which of the following is NOT a dimension measured by the Gender Inequality Index (GII)?
(a) Labour market participation
(b) Empowerment
(c) Reproductive health
(d) Access to clean drinking water

Q38. In Windows XP, which component provides a graphical interface for users to open and access software programs and applications?
(a) Task Manager
(b) Control Panel
(c) Start Menu
(d) File Explorer

Q39. n a certain code language, 'WIND' is coded as '6482' and 'DOGS' is coded as '3671'. What is the code for 'D' in the given code language?
(a) 6
(b) 3
(c) 1
(d) 2

Q40. In March 2025, India launched 'Operation Brahma' in response to which event?
(a) A devastating earthquake in Myanmar
(b) A major flood in northeastern India
(c) A cyclone affecting the eastern coast of India
(d) A volcanic eruption in the Andaman Islands

Q41. The Monetary Policy Committee (MPC) 2025 reduced the policy repo rate under the liquidity adjustment facility (LAF) by 25 basis points with immediate effect to ____.
(a) 6.25 per cent
(b) 5.25 per cent
(c) 5.50 per cent
(d) 6.0 per cent

Q42. Mr. O starts from Point L and drives 3 km towards the south. He then takes a left turn, drives 3 km, turns right and drives 4 km. He then takes a left turn and drives 4 km. He takes a final left turn, drives 7 km and stops at Point M. How far (shortest distance) and towards which direction should he drive in order to reach Point L again? (All turns are 90 degree turns only unless specified.)
(a) 7 km towards the west
(b) 3 km towards the north
(c) 7 km towards the east
(d) 4 km towards the south

Q43. What is the region lying to the north of the Narmada River called?
(a) Deccan Plateau
(b) Chota Nagpur Plateau
(c) Central Highlands
(d) Eastern Ghats

Q44. Mohan invested Rs. 1,320 at 6% per annum simple interest in a bank. What amount (in Rs.) will he get after 6 years?
(a) 475.2
(b) 575.2
(c) 1,795.2

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(d) 1,695.2

Q45. A cistern has a hole in the bottom through which the water is leaking. A tap can fill the cistern in 6 hours and the hole in the bottom can empty the fully filled cistern in 15 hours. If both the tap and the hole are open, then what will be the time taken to completely fill the empty cistern?

(a) 26.1 hour
(b) 10 hours
(c) 22 hours
(d) 14 hours

Q46. If the eight-digit number 43377p08 is divisible by 8, then the maximum value of p is:

(a) 6
(b) 4
(c) 8
(d) 7

Q47. Which of the following statements regarding the 2024 Delhi Assembly elections are correct?

1. The candidate who won the election with the largest margin belongs to BJP.
2. Parvesh Verma defeated Arvind Kejriwal in the New Delhi Assembly constituency and was elected as the Deputy Chief Minister of Delhi.
3. The Aam Aadmi Party (AAP) secured 22 seats in this election.
4. The Indian National Congress improved its seat tally compared to the previous election.

(a) Only 2, 3 and 4
(b) Only 2 and 3
(c) Only 1 and 3
(d) Only 1 and 4

Q48. Which country took over the presidency of the G7 in January 2025?

(a) Britain
(b) France
(c) Australia
(d) Canada

Q49. The Periplus of the Erythraean Sea was written in the:

(a) 5^(th) century AD
(b) 1^(st) century AD
(c) 3^(rd) century AD
(d) 2^(nd) century B

Q50. For what values of b, the quadratic equation $4x^2 + bx + 16 = 0$ has equal real roots?

(a) −4 and −8
(b) 16 and −16
(c) 4 and −4
(d) 8 and −8

Q51. Town N is to the east of Town O. Town P is to the north of Town N. Town Q is to the south of Town P. Town R is to the west of Town Q. Town O is to the north-east of Town R. What is the position of Town N with respect to Town Q?

(a) East
(b) West
(c) North
(d) South

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Q52. In Windows OS, which of the following actions will permanently delete a file without sending it to the Recycle Bin?

(a) Press the Delete key
(b) Press Shift + Delete
(c) Rename the file
(d) Right-click and select Open

Q53. How much will a sum of Rs. 72,000 become after one year if the interest is compounded half-yearly at 10% per annum compound interest?

(a) Rs. 79,510
(b) Rs. 78,632
(c) Rs. 80,378
(d) Rs. 79,380

Q54. 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 that follows the same logic.

REAL - LRAE - RLEA

MAKE - EMKA - MEAK

(a) COPE - ECPO - CEOP
(b) HUGS - UHGS - SUGH
(c) POUR - RPUO - PORU
(d) KEYS - SKEY - EYSK

Q55. In quadrilateral PQRS, the bisectors of angle R and angle S meet at point T (inside the quadrilateral) and angle STR = 32.5°. If the ratio of angle P to angle Q is 4 : 9, then what is the difference between the measures of angle Q and angle P?

(a) 24°
(b) 27°
(c) 28°
(d) 25°

Q56. According to the Economic Survey 2023-24, what percentage of India's population is expected to reside in urban areas by 2030?

(a) 50%
(b) 45%
(c) 35%
(d) 40%

Q57. Which of the following ports is located in West Coastal Plain?

(a) Kolkata
(b) Paradip
(c) Visakhapatnam
(d) Mangalore

Q58. What happens to magnetic fields when a material becomes superconducting and experiences the Meissner effect?

(a) Magnetic fields are completely expelled from the interior of the material.
(b) Magnetic fields penetrate the material freely.
(c) Magnetic fields are increased in strength within the material.
(d) Magnetic fields are absorbed and stored inside the material.

Q59. RR 14 is related to UN 3 in a certain way. In the same way, BV 10 is related to ER −1. To which of the given options is PE 1 related, following the same logic?

(a) VS −9
(b) RI 8
(c) PV 2
(d) SA −10

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Q60. Where was the central celebration of Parakram Diwas, held in January 2025, to mark Subhas Chandra Bose's 128th birth anniversary?

(a) Victoria Memorial, Kolkata, West Bengal
(b) Netaji Bhawan, Kolkata, West Bengal
(c) Barabati Fort, Cuttack, Odisha
(d) Red Fort, New Delhi, Delhi

Q61. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

EA-GC-JL

GC-IE-LN

(a) LG-MJ-PS
(b) LG-MI-PS
(c) KG-MI-PS
(d) KG-MI-PR

Q62. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding/subtracting/multiplying to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(25, 900, 18)

(23, 874, 19)

(a) (49, 1575, 16)
(b) (40, 807, 10)
(c) (30, 1147, 19)
(d) (42, 1176, 14)

Q63. Which of these is the westernmost inhabited village in India?

(a) Lakhpat
(b) Tanot
(c) Koteshwar
(d) Ghuar Mota

Q64. What will come in the place of '?' in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

45 ÷ 12 − 75 × 5 + 13 = ?

(a) 542
(b) 544
(c) 546
(d) 545

Q65. Co-operative societies are primarily accountable to which of the following?

(a) Local Municipal Body
(b) Co-operative Society Members
(c) Central Government
(d) Reserve Bank of India

Q66. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) £ @ 5 6 3 © & 4 9 % * $ $ % 6 & # & € © 5 8 (Right)

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

(a) 2
(b) 3

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(c) 1
(d) 0

Q67. A, B, C, D, R, S and T are sitting around a circular table facing the centre of the table. S sits fourth to the left of C. R sits fourth to the right of A. Only two people sit between C and A when counted from the left of C. D is not an immediate neighbour of R or C. B is not an immediate neighbour of D. Who sits fourth to the right of T?
(a) S
(b) A
(c) C
(d) R

Q68. When were the Municipal Corporations of Calcutta and Bombay established?
(a) 1919
(b) 1850
(c) 1882
(d) 1726

Q69. Which programme of the Indian Government uses Socio-Economic and Caste Census (SECC) data for identifying beneficiaries?
(a) Mahatma Gandhi National Rural Employment Guarantee Act
(b) Pradhan Mantri Awaas Yojana - Gramin
(c) National Rural Health Mission
(d) Digital India

Q70. 'The Flying Apsara' painting is a masterpiece in which of the following caves?
(a) Elephanta
(b) Karle
(c) Ajanta
(d) Ellora

Q71. A shopkeeper marks the price of an article at Rs. 5,180. Find the cost price if after allowing a discount of 31% he still gains 5% on the cost price.
(a) Rs. 3,404
(b) Rs. 3,470
(c) Rs. 3,387
(d) Rs. 3,376

Q72. A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6. B lives on a floor that is a prime number. The product of floors on which B and D live is 3. Only 2 people live above C. F lives immediately below A. How many people live between A and C?
(a) 2
(b) 1
(c) 4
(d) 3

Q73. A swimmer can swim downstream at 37 km/hr and upstream at 27 km/hr. What is the speed of the swimmer in still water?
(a) 26 km/hr
(b) 32 km/hr
(c) 33 km/hr
(d) 31 km/hr

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Q74. If ‘W’ stands for ‘÷’, ‘X’ stands for ‘×’, ‘Y’ stands for ‘+’ and ‘Z’ stands for ‘−’, then the resultant of which of the following would be 908?

(a) 128 X 32 Y 120 Z 64 W 16
(b) 128 W 32 Z 120 Y 64 X 16
(c) 128 Z 32 X 120 Y 64 Z 16
(d) 128 Y 32 Z 120 X 64 W 16

Q75. Which of the following ratios is the greatest?

(a) 34 : 51
(b) 38 : 77
(c) 27 : 76
(d) 31 : 72

Q76. The value of 57 + [5 + { 72 - (24 ÷ 6)} ÷ 4] is:

(a) 79
(b) 81
(c) 89
(d) 82

Q77. Where was the 2024 Regional World Children's Day commemorated by UNICEF from 15 to 17 November?

(a) Johannesburg, South Africa
(b) Victoria Falls, Zimbabwe
(c) Nairobi, Kenya
(d) Addis Ababa, Ethiopia

Q78. DG 24 is related to WT 20 in a certain way based on the English alphabetical order. In the same way, IL 18 is related to BY 14. To which of the following is QT 30 related, following the same logic?

(a) JG 34
(b) RU 26
(c) JG 26
(d) HF 28

Q79. Which reformer gave the slogan 'One God, One Caste'?

(a) Dayanand Saraswati
(b) Jyotiba Phule
(c) Keshub Chandra Sen
(d) Narayana Guru

Q80. Under what circumstance can the President of India dissolve the Lok Sabha before its normal term expires?

(a) On the recommendation of the Prime Minister
(b) Whenever the President wishes, without any conditions
(c) After consulting a joint session of both Houses of Parliament
(d) When the Supreme Court orders a dissolution

Q81. The arithmetic mean of the observations 83, 17, 62, 87, 62, 96, 86, 92 and 90 is:

(a) 85
(b) 74
(c) 75
(d) 79

Q82. Three numbers are in the ratio 5/14 : 16/13 : 20/14. The difference between the largest and the smallest number is 30. Find the largest number.

(a) 40
(b) 39
(c) 41

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(d) 42

Q83. If (3, 2) are coordinates of the centroid of a triangle, whose vertices are (0, 4), (-2, 0) and (p, 2), then find the value of p.

(a) 9
(b) 11
(c) 10
(d) 8

Q84. 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) MTO
(b) JQL
(c) PWR
(d) GNJ

Q85. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

GM17, IO25, KQ33, MS41, ?

(a) OU48
(b) OV48
(c) OV49
(d) OU49

Q86. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 8132574, how many digits will appear more than once in the new number thus formed?

(a) 3
(b) 2
(c) 4
(d) 1

Q87. Ravi travels from City A to City B. If Ravi drives his car at 2/7 of his normal speed, then he reaches City B 30 minutes late. Find the time (in minutes) that Ravi would have taken to travel from City A to City B if he drove at his normal speed.

(a) 3
(b) 5
(c) 19
(d) 12

Q88. In this question, a group of letters is coded by using numbers and symbols as per the table given below and the conditions which follow.

Letter	U	M	S	J	P	T	F	E	A
Code	7	4	@	$	%	•	6	2	3

Conditions:

1. If the 1st letter is a vowel and the 3rd letter is a consonant, both to be coded as the code of the consonant.
2. If the 1st and last letters are vowels, both are to be coded as ‘N’.
3. If the 2nd and last letters are vowels, their codes are to be interchanged.

What is the correct combination of codes (by following only the applicable condition(s) for the following letters?

UJEPA

(a) N $ 2 % 3
(b) 7 $ 2 % N
(c) 7 $ 2 % 3

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(d) N $ 2 % N

Q89. What is the temperature of the triple point of water on the Celsius scale?

(a) 100°C
(b) 0°C
(c) -273.15°C
(d) 0.01°C

Q90. Harappan seals were made mostly from which of the following?

(a) Marble
(b) Terracotta
(c) Steatite
(d) Iron

Q91. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 2 @ % * 2 7 4 8 € @ % © $ 7 6 6 * $ 7 £ 7 6 (Right)

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

(a) 2
(b) 1
(c) 3
(d) 4

Q92. What happens when you press Ctrl + S while working on a document in computer system?

(a) Sends the document
(b) Saves the current document
(c) Searches the document
(d) Starts a slide show

Q93. The famous 'Trimurti' sculpture is present in which of the following caves?

(a) Ellora caves
(b) Ajanta caves
(c) Karle caves
(d) Elephanta caves

Q94. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) £ % * 3 6 £ 1 © & 8 1 5 5 3 * # © 7 1 7 3 @ (Right)

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

(a) 2
(b) 1
(c) 3
(d) 0

Q95. The cost of 15 pens and 6 pencils is Rs. 291. If the cost of a pen decreases by Rs. 9 and the cost of a pencil increases by Rs. 2, then the cost of 9 pens and 3 pencils is Rs. 75. What is the original cost of 12 pens and 3 pencils?

(a) Rs. 161
(b) Rs. 159
(c) Rs. 158
(d) Rs. 157

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Q96. If the mode of the following data is 165, then what is the value of x?

Class	150-155	155-160	160-165	165-170	170-175
Frequency	23	25	37	x	28

(a) 43
(b) 53
(c) 37
(d) 54

Q97. In January 2025, which filmmaker received the Satyajit Ray Lifetime Achievement Award?
(a) Shyam Benegal
(b) Anurag Kashyap
(c) Ramesh Sipp
(d) Aparna Sen

Q98. A cylinder is made by rolling a rectangular paper along its breadth. Find the curved surface area of the cylinder, if the length and breadth of the rectangle are 12 m and 7.48 m, respectively. (Use π = 22/7)
(a) 89.76 m²
(b) 100.24 m²
(c) 44.88 m²
(d) 98.66 m²

Q99. Shubham ranked 19^(th) from the top and 46^(th) from the bottom in his class. How many students are there in his class?
(a) 62
(b) 63
(c) 65
(d) 64

Q100. A group of numbers and symbols is coded using letter codes as per the codes given below and the conditions that follow. Study the given codes and conditions and answer the question that follows.

Note: If none of the conditions apply, then codes for the respective number/symbol are to be followed directly as given in the table.

Number/symbol	@	4	6	9	$	•	3	%	#	7	&	5	$	2
Code	L	V	C	M	K	P	B	Q	Z	Y	R	B	U	F

Conditions:

If the first element is a symbol and the last an odd number, the codes for these two (the first and the last elements) are to be interchanged.

If the first element is an odd number and the last an even number, the first and last elements are to be coded as ©.

If both second and third elements are perfect squares, the third element is to be coded as the code for the second element.

What will be the code for the following group?

• 6 # 5

(a) PCZB
(b) BCZP
(c) PCCB
(d) PZZB

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ANSWER KEY

1	b	2	b	3	b	4	b	5	b	6	c	7	a	8	d	9	d	10	c
11	d	12	b	13	b	14	a	15	d	16	d	17	b	18	c	19	b	20	b
21	a	22	b	23	c	24	c	25	a	26	a	27	c	28	a	29	b	30	c
31	c	32	b	33	b	34	b	35	a	36	d	37	d	38	c	39	a	40	a
41	d	42	a	43	c	44	c	45	b	46	c	47	b	48	d	49	b	50	b
51	c	52	b	53	d	54	a	55	d	56	d	57	d	58	a	59	d	60	c
61	d	62	d	63	d	64	a	65	b	66	c	67	a	68	d	69	b	70	c
71	a	72	b	73	b	74	b	75	a	76	a	77	b	78	c	79	d	80	a
81	c	82	a	83	b	84	d	85	d	86	b	87	d	88	d	89	d	90	c
91	a	92	b	93	d	94	b	95	b	96	c	97	d	98	a	99	d	100	b

SOLUTIONS

Q1. Answer: (b) N

Given: D, E, F, G, M, N and O are sitting around a circular table, facing the centre of the table.

1) M sits third to the left of O.

2) G sits to the immediate left of O.

3) Only E sits between N and M.

4) D is not an immediate neighbour of M.

After positioning D only one position is left which will be occupied by the only person left i.e. F.

Thus, N sits third to the left of F.

Hence, "Option 2" is the correct answer.

Q2. Answer: (b) 7,149

Shortcut Trick

Total difference in Selling Prices = 8,378 − 1,756 = 6,622.

Ratio of Gain to Loss = 120 : 100 = 6 : 5.

Sum of ratio parts = 6 + 5 = 11 units. So, 11 units = 6,622.

1 unit = 602. Loss (5 units) = 5 × 602 = 3,010.

Cost Price (CP) = 1,756 + 3,010 = 4,766.

New SP (50% gain) = 4,766 × 1.5 = 7,149.

Therefore The correct answer is Rs. 7,149.

Alternate Method

Given → SP1 = 8,378, SP2 = 1,756, Gain = Loss + 20% of Loss, New Gain% = 50%.

Formulas: Gain = SP − CP | Loss = CP − SP | SP = CP × (100 + Gain%) ÷ 100.

=> Let Loss be x. Then Gain = 1.2x.

=> (8,378 − CP) = 1.2 × (CP − 1,756).

=> 8,378 − CP = 1.2CP − 2,107.2.

=> 2.2CP = 10,485.2.

=> CP = 4,766.

=> New SP = 4,766 + (50% of 4,766) = 4,766 + 2,383 = 7,149.

Therefore The correct answer is Rs. 7,149.

Additional Information

Percentage Relationship

If value A is x% more than B, then A = B × (100 + x) ÷ 100.

Cost Price Calculation

CP can be found using CP = SP − Profit or CP = SP + Loss.

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Q3. Answer: (b) Leh, Ladakh

The correct answer is Leh, Ladakh.

Key Points

• In March 2025, the region of Leh, Ladakh was announced as the site for the world's first high-altitude para sports centre.

• The initiative aims to boost preparations for the 2028 Paralympics, enhancing India's global competitiveness in para-sports.

• The high-altitude environment in Leh is ideal for training athletes, as it helps improve endurance and performance by acclimatizing them to challenging conditions.

• The centre will also focus on training, rehabilitation, and research for para-athletes, making it a hub for innovation in para-sports.

• This project reflects India's commitment to developing infrastructure for para-sports and promoting inclusivity in athletics.

Additional Information

• Leh, Ladakh:

• Situated at an altitude of approximately 3,500 meters above sea level, Leh is known for its challenging terrain and high-altitude environment.

• The region provides natural conditions that mimic high-performance training environments, essential for athletes preparing for international competitions.

• Paralympics:

• The Paralympics is a major international multi-sport event involving athletes with disabilities.

• The 2028 Paralympics will be held in Los Angeles, USA.

• High-altitude Training Benefits:

• Training at high altitudes increases red blood cell production, improving oxygen delivery to muscles.

• This enhances athletic performance and endurance, especially in endurance sports.

• India's Para-sports Development:

• India has been investing in para-sports infrastructure and athlete development to improve its global standing.

• Initiatives like the high-altitude centre in Leh signify a strong push towards inclusivity and excellence in sports.

Q4. Answer: (b) 13

Shortcut Trick

Let the smaller number be x and greater number be y.

Given: y − x = 2134 and y = 2x + 147.

Substitute y: (2x + 147) − x = 2134 => x = 2134 − 147 = 1987.

Greater number y = 1987 + 2134 = 4121.

HCF(4121, 4225) → Difference = 4225 − 4121 = 104. Factors of 104 are 1, 2, 4, 8, 13, 26, 52, 104. Testing 13: 4121 ÷ 13 = 317.

Therefore The correct answer is 13.

Alternate Method

Given:

Difference (y − x) = 2134

Division rule: Dividend = (Divisor × Quotient) + Remainder

=> y = (x × 2) + 147

=> y = 2x + 147

Calculations:

=> (2x + 147) − x = 2134

=> x + 147 = 2134

=> x = 1987

=> y = 1987 + 2134 = 4121

Now, find HCF of 4121 and 4225:

=> 4225 = 4121 × 1 + 104

=> 4121 = 104 × 39 + 65

=> 104 = 65 × 1 + 39

=> 65 = 39 × 1 + 26

=> 39 = 26 × 1 + 13

=> 26 = 13 × 2 + 0

Therefore The correct answer is 13.

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Additional Information

Euclid's Division Lemma

For any two positive integers a and b, there exist unique integers q and r such that a = bq + r, where 0 ≤ r < b.

HCF by Difference Method

The HCF of two numbers also divides their difference. This is useful for finding HCF of large numbers quickly.

Properties of HCF

HCF(a, b) = HCF(a, b − a). If a number k divides both a and b, then k must divide the HCF of a and b.

Q5. Answer: (b) 3584/π

Shortcut Trick

When a rectangular sheet is rolled along its length, the length becomes the circumference (2πr) and the width becomes the height (h).

Circumference 2πr = 32 => r = 16/π

Volume V = πr²h = π × (16/π)² × 14

V = π × (256/π²) × 14 = (256 × 14)/π = 3584/π

Therefore The correct answer is 3584/π cm³.

Alternate Method

Given:

Length of sheet (L) = 32 cm

Width of sheet (W) = 14 cm

Formula Used:

Circumference of circle = 2πr

Volume of cylinder = πr²h

Calculations:

=> When rolled along the length, Circumference = 32 cm

=> 2 × π × r = 32

=> r = 32 / (2π) = 16/π cm

=> Height of the cylinder (h) = Width of the sheet = 14 cm

=> Volume (V) = π × r² × h

=> V = π × (16/π)² × 14

=> V = π × (256 / π²) × 14

=> V = (256 × 14) / π

=> V = 3584/π cm³

Therefore The correct answer is 3584/π cm³.

Additional Information

Cylinder Rolling (Along Width)

If the sheet is rolled along its width, the width becomes the circumference (2πr = W) and the length becomes the height (h = L).

Curved Surface Area (CSA)

The CSA of the resulting cylinder is always equal to the Area of the Rectangular Sheet (L × W), which is 2πrh.

Total Surface Area (TSA)

The TSA of a solid cylinder includes the top and bottom circles: TSA = 2πrh + 2πr² = 2πr(h + r).

Q6. Answer: (c) Article 24

The correct answer is Article 24.

Key Points

• Article 24 of the Constitution of India prohibits the employment of children below the age of 14 years in factories, mines, or any hazardous occupations.

• This provision is part of the fundamental rights under the Right against Exploitation outlined in the Constitution.

• The article aims to protect children from exploitation and hazardous working conditions that can harm their physical and mental health.

• It aligns with the government's commitment to ensuring the welfare and development of children by preventing child labor in unsafe environments.

• India has ratified international conventions such as the UN Convention on the Rights of the Child and the ILO Convention No.

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182 to combat child labor.

Additional Information

• Child Labor Prohibition and Regulation Act, 1986:

• This act regulates the working conditions for children and prohibits their employment in hazardous occupations.

• It defines hazardous occupations and processes where child labor is strictly prohibited.

• The Right to Education Act, 2009:

• This act ensures free and compulsory education for children aged 6 to 14 years, thereby indirectly combating child labor.

• Education is seen as a key tool to prevent children from being exploited in the workforce.

• National Child Labor Project (NCLP):

• Under this initiative, children withdrawn from hazardous work are enrolled in special schools to provide education, nutrition, and vocational training.

• The program aims to rehabilitate child laborers and integrate them into the mainstream education system.

• International Initiatives:

• India is a signatory to the ILO Minimum Age Convention (No. 138), which sets the minimum age for employment.

• The Sustainable Development Goals (SDGs) also emphasize the elimination of child labor under Goal 8 (Decent Work and Economic Growth).

Q7. Answer: (a) 7,056

Shortcut Trick

Since the person spends 50% of his monthly income, his savings percentage is also 50% (100% − 50%).

When Expenditure % = Savings %, then the Expenditure value = Savings value.

Given Savings = Rs. 7,056.

Therefore, Monthly Expenses = Rs. 7,056.

Therefore The correct answer is Rs. 7,056.

Alternate Method

Given:

Monthly Savings = Rs. 7,056

Expenditure Percentage = 50%

Formula Used:

Income = Expenditure + Savings

Savings % = 100% − Expenditure %

Calculations:

=> Savings % = 100% − 50% = 50%

=> 50% of Income = Rs. 7,056

=> Monthly Expenses = 50% of Income

=> Monthly Expenses = Rs. 7,056

Therefore The correct answer is Rs. 7,056.

Additional Information

Income-Expenditure Relation

Total Income is always the sum of Expenditure and Savings. Income = Expenditure + Savings.

Percentage Change

If income increases by x% and expenditure increases by y%, the change in savings depends on the initial ratio of expenditure to savings.

Base Value

In income-based problems, the Total Income is generally treated as the base value (100%) for calculating percentages of spending or saving.

Q8. Answer: (d) Dadabhai Naoroji

The correct answer is Dadabhai Naoroji.

Key Points

• Dadabhai Naoroji was an Indian political leader, educator, and economist who is famously known as the 'Grand Old Man of India.'

• He introduced the 'Drain of Wealth' theory in his book "Poverty and Un-British Rule in India," published in 1901.

• The theory highlighted how the British systematically drained India's wealth and resources for their economic benefit.

• Naoroji was the first Indian to become a member of the British Parliament, where he actively raised concerns about the economic exploitation of India.

• The 'Drain of Wealth' theory became a cornerstone for the Indian freedom movement, influencing leaders like Mahatma Gandhi and Bal Gangadhar Tilak.

Additional Information

• Key Aspects of the 'Drain of Wealth' Theory:

• The theory argued that a significant portion of India's wealth was being transferred to Britain in the form of home charges (administrative expenses and pensions).

• Export of raw materials and the import of finished goods from Britain created a massive trade imbalance.

• Indian taxpayers funded the salaries and pensions of British officials, further depleting the country's resources.

• Impact of the Theory:

• The theory exposed the economic exploitation of India under British rule, fueling nationalist sentiments.

• It provided a strong economic argument for independence and self-rule.

• Dadabhai Naoroji's Other Contributions:

• He co-founded the Indian National Congress (INC) in 1885, which later became the primary political platform for India's independence struggle.

• He was the first Indian to be elected to the British House of Commons in 1892 as a Liberal Party candidate.

• Other Advocates of Economic Nationalism:

• While Naoroji introduced the 'Drain of Wealth' theory, other leaders like Gopal Krishna Gokhale and R.C. Dutt also highlighted the economic impact of British policies.

Q9. Answer: (d) It makes mediation compulsory for all civil and commercial disputes before court proceedings.

The correct answer is It makes mediation compulsory for all civil and commercial disputes before court proceedings.

Key Points

• The Mediation Act, 2023 introduces mandatory pre-litigation mediation for civil and commercial disputes, aiming to reduce the burden on courts.

• This legislation promotes a time-bound dispute resolution mechanism, ensuring faster settlements through mediation.

• The Act establishes a Mediation Council of India to regulate the conduct of mediators and mediation institutions.

• It provides legal recognition to mediated settlement agreements, making them enforceable as court decrees.

• The Act encourages participation of trained mediators, ensuring professional and impartial facilitation in dispute resolution processes.

Additional Information

• Mediation:

• Mediation is a voluntary and collaborative process where disputing parties work with a neutral third party (mediator) to resolve their issues.

• It differs from arbitration as it does not involve binding decisions made by a third party.

• Mediation Council of India:

• Established under the Mediation Act, 2023, the council oversees the accreditation of mediators and mediation service providers.

• It aims to standardize mediation practices across India.

• Mediated Settlement Agreements:

• These agreements, reached through mediation, carry legal enforceability under the Act.

• They are treated as final and binding, similar to court decrees.

• Pre-litigation Mediation:

• This process requires disputing parties to attempt mediation before approaching the court.

• It helps in reducing litigation costs and court congestion.

Q10. Answer: (c) Windows 95

The correct answer is Windows 95.

Key Points

• Windows 95 was the first version of the Windows operating system to introduce the Start menu, a revolutionary feature for navigation.

• The Start menu combined the list of installed programs with quick access to system settings, making it user-friendly and efficient.

• It was launched on August 24, 1995, and marked a significant shift towards graphical user interfaces (GUI).

• The Start button, located at the bottom-left corner of the screen, became a hallmark of Windows operating systems.

• This version also introduced other innovations like the taskbar, long file names, and built-in support for plug-and-play hardware.

Additional Information

• Windows Operating System:

• Windows is a family of operating systems developed by Microsoft, designed for personal computers, tablets, and embedded systems.

• It is one of the most widely used operating systems globally, with billions of active installations.

• Graphical User Interface (GUI):

• The GUI allows users to interact with electronic devices through visual indicators like icons and buttons instead of text-based interfaces.

• Windows 95 was a major step forward in popularizing GUI for mainstream computer users.

• Taskbar:

• The taskbar, introduced in Windows 95, allows users to see and switch between open applications easily.

• It is located at the bottom of the screen and includes the Start button, quick launch icons, and the system clock.

• Plug and Play (PnP):

• Windows 95 introduced built-in support for PnP, allowing hardware devices to be automatically recognized and configured by the operating system.

• This feature greatly simplified the process of adding new hardware to a computer.

• Legacy of Start Menu:

• The Start menu became an iconic feature of Windows, evolving through subsequent versions like Windows XP, Windows 7, and Windows 10.

• It remains a central element for accessing applications and settings in modern Windows systems.

Q11. Answer: (d) $9z^2 + 90y^2$

Shortcut Trick

Observe that in $(3z - 9y)^2$ and $(9z + 3y)^2$, the middle terms are $-2(3z)(9y) = -54zy$ and $+2(9z)(3y) = +54zy$.

These terms cancel each other out when added.

Remaining terms: $(3z)^2 + (9y)^2 + (9z)^2 + (3y)^2 - 81z^2$

=> $9z^2 + 81y^2 + 81z^2 + 9y^2 - 81z^2 = 9z^2 + 90y^2$

Therefore The correct answer is $9z^2 + 90y^2$.

Alternate Method

Given: $(3z - 9y)^2 + (9z + 3y)^2 - 81z^2$

Formula Used: $(a - b)^2 = a^2 - 2ab + b^2$ and $(a + b)^2 = a^2 + 2ab + b^2$

=> $(3z - 9y)^2 = (3z)^2 - 2 \times 3z \times 9y + (9y)^2 = 9z^2 - 54zy + 81y^2$

=> $(9z + 3y)^2 = (9z)^2 + 2 \times 9z \times 3y + (3y)^2 = 81z^2 + 54zy + 9y^2$

=> Adding both expansions: $(9z^2 - 54zy + 81y^2) + (81z^2 + 54zy + 9y^2) = 90z^2 + 90y^2$

=> Final simplification: $90z^2 + 90y^2 - 81z^2$

=> $(90z^2 - 81z^2) + 90y^2 = 9z^2 + 90y^2$

Therefore The correct answer is $9z^2 + 90y^2$.

Additional Information

Binomial Square Identities

The identities $(a + b)^2 = a^2 + 2ab + b^2$ and $(a - b)^2 = a^2 - 2ab + b^2$ are fundamental algebraic identities used to expand squared binomials.

Combining Like Terms

Terms that have the same variable and exponent (like $9z^2$ and $81z^2$) can be added or subtracted by operating on their coefficients.

Sum of Squared Binomials

If the terms are identical, $(a + b)^2 + (a - b)^2 = 2(a^2 + b^2)$. In this problem, while terms differed, the middle terms still canceled due to the structure $2(3z)(9y) = 2(9z)(3y)$.

Q12. Answer: (b) Brother's Wife's Father

Decoding the Symbols:

A is				
Symbol	•	−	×	÷

Meaning	Sister	Brother	Wife	Father
to B				

Given: M ÷ N × O − P + Q

M ÷ N → M is the father of N.

N × O → N is the wife of O.

O − P → O is the brother of P.

P + Q → P is the sister of Q.

Thus, M is Q's brother's wife's father.

Hence, "Option 2" is the correct answer.

Q13. Answer: (b) RNK 26

The logic followed here is:

Hence, "Option 2" is the correct answer.

Q14. Answer: (a) 550

Shortcut Trick

Convert percentages to decimals: 20% = 0.2 and 1200% = 12.

The equation becomes: 0.2 × k = (12 × 10) − 10

0.2k = 120 − 10 = 110

k = 110 ÷ 0.2 = 1100 ÷ 2 = 550

Therefore The correct answer is 550.

Alternate Method

Given: 20% of k = (1200% of 10) − 10

Calculations:

=> 20/100 × k = (1200/100 × 10) − 10

=> 1/5 × k = (12 × 10) − 10

=> k/5 = 120 − 10

=> k/5 = 110

=> k = 110 × 5

=> k = 550

Therefore The correct answer is 550.

Additional Information

Percentage to Fraction Conversion

To convert x% to a fraction, divide by 100: x/100. For example, 1200% = 1200/100 = 12.

Percentage Change Formula

Percentage change = [(New Value − Original Value) ÷ Original Value] × 100.

A% of B property

A% of B is always equal to B% of A. This can simplify many mental calculations.

Q15. Answer: (d) Sri Lanka

The correct answer is Sri Lanka.

Key Points

• The Palk Strait is a narrow stretch of water separating India and Sri Lanka.

• It connects the Bay of Bengal in the northeast with the Gulf of Mannar in the southwest.

• On the Indian side, the Palk Strait borders the state of Tamil Nadu, while on the Sri Lankan side, it borders the Northern Province.

• Adam's Bridge (also known as Ram Setu), a chain of limestone shoals, lies within the Palk Strait and historically connected India to Sri Lanka.

• The Palk Strait is named after Robert Palk, a British governor of Madras during the 18th century.

Additional Information

• Geography of the Palk Strait:

• The strait is approximately 40 to 85 miles (64 to 137 km) wide.

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• It is relatively shallow, making navigation challenging for large ships.
• Adam's Bridge (Ram Setu):
• A chain of natural limestone shoals, believed to have formed naturally.
• It holds mythological significance in the Indian epic Ramayana as the bridge built by Lord Rama’s army to reach Lanka.
• Economic and Strategic Importance:
• The strait supports fishing and trade activities between India and Sri Lanka.
• It holds strategic importance for maritime routes in the Indian Ocean region.
• Marine Biodiversity:
• The Palk Strait is home to diverse marine life, including fish, crustaceans, and seaweed.
• Efforts are being made to preserve its unique ecosystem due to overfishing and habitat destruction.

Q16. Answer: (d) Privy Council in London

The correct answer is Privy Council in London.

Key Points

• The Privy Council in London served as the highest court of appeal for India during British rule.
• It was established as the final judicial authority to resolve disputes from colonies, including India, under the British Empire.
• Indian cases were appealed to the Privy Council after decisions from the Federal Court or provincial courts under colonial judicial hierarchy.
• The Privy Council's decisions were binding and considered the ultimate authority in legal matters during British rule.
• After independence, the jurisdiction of the Privy Council over Indian cases was abolished with the enactment of the Federal Court (Enlargement of Jurisdiction) Act, 1948, and later replaced by the Supreme Court of India.

Additional Information

• Federal Court of India
• Established in 1937 under the Government of India Act, 1935 to function as India's highest court below the Privy Council.
• It dealt with disputes between provinces and the central government and had appellate jurisdiction over certain cases.
• Its role was significant but limited compared to the Privy Council.
• Privy Council's Role
• The Privy Council was composed of legal experts and judges in London.
• It played a crucial role in shaping colonial law and ensuring uniformity in legal decisions across British territories.
• Abolition of Privy Council Appeals
• Post-independence, the appeals to the Privy Council were abolished through legislative measures.
• The Supreme Court of India became the highest judicial authority in the country.
• Supreme Court of India
• Established on January 28, 1950, as the apex court of India under the Constitution.
• It replaced the Federal Court and took over the judicial functions previously held by the Privy Council.

Q17. Answer: (b) .potx

The correct answer is .potx.

Key Points

• The .potx file format is used for saving MS PowerPoint templates, which store pre-designed slides and layouts for presentations.
• It is a part of the Office Open XML file formats introduced in Microsoft Office 2007 and later versions.
• Templates saved in .potx format allow users to create new presentations with consistent designs and formatting.
• .potx files are XML-based, making them more efficient and easier to integrate with other applications compared to older formats.
• Unlike .pptx (presentation files), .potx files are specifically designed to be reused as templates for multiple presentations.

Additional Information

• .pptx File Format:
• Used for saving regular PowerPoint presentations.
• Supports multimedia elements like images, audio, and video.
• Introduced with Microsoft Office 2007 and uses XML-based compression.
• .ppsm and .ppsx File Formats:
• .ppsm files enable macro-enabled presentations.
• .ppsx files save presentations that directly open in slideshow mode.
• Difference Between .potx and .pptx:

• .potx files are templates for creating new presentations, while .pptx files are standalone presentations.
• .potx files ensure consistency across presentations based on the same template.
• Office Open XML Formats:
• Introduced in Microsoft Office 2007.
• Includes file formats like .docx, .xlsx, .pptx, and .potx.
• Offers better compression, integration, and data recovery than legacy formats.

Q18. Answer: (c) Simple majority

The correct answer is Simple majority.

Key Points

• Articles 2 and 3 of the Indian Constitution deal with the admission or establishment of new states and the alteration of areas, boundaries, or names of existing states.
• As per Article 4(2), laws made under Articles 2 and 3 require only a simple majority in Parliament, not a special or two-thirds majority.
• A simple majority means that the majority of members present and voting in each house of Parliament is sufficient to pass the law.
• Unlike constitutional amendments (which often require special or two-thirds majorities), these laws are considered ordinary legislation.
• This provision ensures flexibility in reorganizing states to address administrative and political needs.

Additional Information

• Simple Majority:
• A simple majority is achieved when more than 50% of the members present and voting support a motion.
• This is the most commonly used voting method for passing ordinary bills in Parliament.
• It excludes abstentions and absent members from the total count.
• Special Majority:
• A special majority requires a higher threshold, such as two-thirds of the members present and voting, or in some cases, two-thirds of the total membership of the house.
• It is typically required for constitutional amendment bills under Article 368.
• State Reorganization:
• State reorganization involves altering the boundaries, names, or areas of states to address linguistic, cultural, or administrative concerns.
• Examples include the formation of Telangana in 2014 and the bifurcation of Andhra Pradesh.
• Articles 2 and 3:
• Article 2 allows Parliament to admit new states or establish new states on terms it deems fit.
• Article 3 enables the reorganization of states through changes in boundaries, areas, and names.
• Article 4(2):
• It specifies that laws made under Articles 2 and 3 are not considered constitutional amendments.
• Thus, they can be enacted through a simple majority, unlike constitutional amendment bills.

Q19. Answer: (b) Davos, Switzerland

The correct answer is Davos, Switzerland.

Key Points

• The World Economic Forum (WEF) Annual Meeting traditionally takes place in Davos, Switzerland, a small ski resort town in the Alps.
• The event gathers global leaders, including heads of state, policymakers, business executives, and thought leaders, to discuss pressing international issues and shape global, regional, and industry agendas.
• Davos is chosen for its remote and secure location, which provides an ideal setting for high-level discussions and networking opportunities.
• The WEF Annual Meeting is known for its theme-based discussions, with each year focusing on a critical global issue. The agenda is designed to address the most urgent challenges of the time.
• The 2025 Annual Meeting, as in previous years, is expected to focus on sustainability, innovation, and inclusive economic growth, continuing the WEF's mission of improving the state of the world.

Additional Information

• World Economic Forum (WEF)

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• Founded in 1971 by Klaus Schwab, the WEF is a non-governmental organization based in Cologny, Switzerland.
• It is best known for its Annual Meeting in Davos, which brings together leaders to address global issues.
• The WEF operates as a platform for public-private cooperation, emphasizing sustainable development and economic progress.
• Davos and its significance
• Davos is a resort town in the Swiss Alps, famous for its ski slopes and hosting the WEF Annual Meeting.
• Its remote location ensures privacy and security, making it an ideal venue for high-profile discussions.
• WEF Themes and Discussions
• Each year, the WEF focuses on a theme that aligns with current global challenges, such as climate change, economic inequality, or technological advancements.
• The discussions are aimed at fostering innovation, collaboration, and actionable solutions to global issues.
• Global Influence
• The WEF brings together leaders from over 100 countries, making it a significant platform for shaping international policies and strategies.
• It has played a role in initiating major global initiatives like the Global Shapers Community and the Fourth Industrial Revolution framework.

Q20. Answer: (b) DV – IN

The logic followed here is:

Option 1) BT – GK

Option 2) DV – IN

Option 3) IA – NR

Option 4) KC – PT

Thus, out of all the options, 'DV – IN' is the odd one out.

Hence, "Option 2" is the correct answer.

Q21. Answer: (a) O

Given: M, N, O, P, Y and Z live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6.

1) Only three people live between Y and Z, where Y lives below Z.

2) P lives on an odd numbered floor and immediately above Y.

Floor	Person
6	Z
5	
4	
3	P
2	Y
1	

3) O lives on one of the floors below M and on one of the floors above N.

Floor	Person
6	Z
5	M
4	O
3	P
2	Y
1	N

Thus, O lives on floor numbered 4.

Hence, "Option 1" is the correct answer.

Q22. Answer: (b) 20

Shortcut Trick

Net efficiency = 1/9 − 1/90 = (10 − 1)/90 = 9/90 = 1/10 per hour.

Time to fill one tank = 10 hours.

Time to fill twice the volume = 10 × 2 = 20 hours.

Therefore The correct answer is 20 hours.

Alternate Method

Given: Filling tap time = 9 hours, Emptying tap time = 90 hours.

Formula Used: Total Work = LCM of time | Efficiency = Total Work ÷ Time

Person	Hours	Total Work	Efficiency
Filling Tap	9	90 units	+10
Emptying Tap	90	−1	

=> Combined efficiency = 10 − 1 = 9 units/hour

=> Capacity of tank = 90 units

=> Target volume (twice) = 90 × 2 = 180 units

=> Time required = 180 ÷ 9 = 20 hours

Therefore The correct answer is 20 hours.

Additional Information

Inlet and Outlet Taps

Inlet pipes have positive efficiency as they add water, while outlet/leakage pipes have negative efficiency as they remove water.

Net Work Done

If two pipes fill and empty at rates 'a' and 'b', the net rate is (1/a − 1/b) per unit time.

Volume Scaling

If the volume to be filled is multiplied by a factor 'k', the total time taken also scales by 'k' assuming constant rates.

Q23. Answer: (c) 1,026.25

Shortcut Trick

Let the assumed average be Rs. 1,000.

Deviation of Group 1 (51 books): 51 × (+120) = +6,120

Deviation of Group 2 (45 books): 45 × (−80) = −3,600

Net deviation = 6,120 − 3,600 = +2,520

Average deviation = 2,520 ÷ (51 + 45) = 2,520 ÷ 96 = 26.25

Actual Average = 1,000 + 26.25 = 1,026.25

Therefore The correct answer is Rs. 1,026.25.

Alternate Method

Given:

Quantity of books from Shop 1 (n1) = 51 | Price (p1) = Rs. 1,120

Quantity of books from Shop 2 (n2) = 45 | Price (p2) = Rs. 920

Formula Used:

Average Price = (Total Cost) ÷ (Total Quantity)

Average = (n1p1 + n2p2) ÷ (n1 + n2)

Calculations:

=> Total cost from Shop 1 = 51 × 1,120 = Rs. 57,120

=> Total cost from Shop 2 = 45 × 920 = Rs. 41,400

=> Total cost of all books = 57,120 + 41,400 = Rs. 98,520

=> Total number of books = 51 + 45 = 96

=> Average price = 98,520 ÷ 96

=> Average price = Rs. 1,026.25

Therefore The correct answer is Rs. 1,026.25.

Additional Information

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Weighted Average

It is the average where each observation is assigned a weight based on its importance or quantity. Formula: $A_w = \Sigma(w_i \times x_i) \div \Sigma w_i$.

Deviation Method for Averages

Instead of multiplying large numbers, assume a mean and calculate the algebraic sum of differences from that mean to find the correction.

Average Speed and Price Relationship

Average price/speed is not just the arithmetic mean of the individual prices/speeds unless the quantities/times are equal.

Q24. Answer: (c) 69

The logic followed here is:

Hence, "Option 3" is the correct answer.

Q25. Answer: (a) 70 kg

Shortcut Trick

Weight of new boy = New Average + (Initial number of boys × Increase in average)

=> New Average = 54 + 2 = 56 kg

=> Weight = 56 + (7 × 2) = 56 + 14 = 70 kg

Therefore The correct answer is 70 kg.

Alternate Method

Given: Average weight of 7 boys = 54 kg, Average increase = 2 kg.

Formula: Total Weight = Average × Number of persons

=> Total weight of 7 boys = 7 × 54 = 378 kg

=> Total number of boys after 1 boy joins = 8

=> New average weight = 54 + 2 = 56 kg

=> Total weight of 8 boys = 8 × 56 = 448 kg

=> Weight of the new boy = Total weight of 8 boys − Total weight of 7 boys

=> Weight of the new boy = 448 − 378 = 70 kg

Therefore The correct answer is 70 kg.

Additional Information

Weighted Average

When two groups are combined, the combined average is (n1A1 + n2A2) ÷ (n1 + n2).

Average of Consecutive Numbers

For a series of consecutive numbers or an AP, the average is simply (First Term + Last Term) ÷ 2.

Replacement Rule

Weight of New person = Weight of Removed person + (Total Number × Change in Average).

Q26. Answer: (a) From 29.17% to 11.28%

The correct answer is From 29.17% to 11.28%.

Key Points

• According to NITI Aayog, India's Poverty Headcount Ratio reduced significantly from 29.17% in 2013-14 to 11.28% in 2022-23.

• This reduction is attributed to the government's focus on poverty alleviation programs and economic growth.

• The data reflects improved living standards across various demographics in India over the given period.

• The report emphasizes the importance of targeted welfare schemes, such as rural development initiatives, skill development programs, and employment generation schemes.

• This reduction aligns with India's commitment to achieving Sustainable Development Goal (SDG) 1, which aims to eliminate poverty.

Additional Information

• Poverty Headcount Ratio (PHCR):

• PHCR measures the percentage of the population living below the poverty line.

• It is an important indicator used to assess poverty levels and monitor progress in poverty reduction.

• Role of NITI Aayog:

• NITI Aayog is India's premier policy think tank that works on socio-economic planning and sustainable development.

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• It provides data and analysis to inform policy decisions on poverty alleviation, health, education, and infrastructure.

• Government Schemes Impacting Poverty:

• Programs like MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) and Pradhan Mantri Awas Yojana have contributed to poverty reduction.

• Skill development initiatives under Skill India have improved employment opportunities and incomes for low-income groups.

• Sustainable Development Goal (SDG) 1:

• SDG 1 aims to end poverty in all its forms everywhere by 2030.

• India's significant reduction in poverty aligns with global efforts to achieve SDG 1.

Q27. Answer: (c) Typhoid

The correct answer is Typhoid.

Key Points

• Typhoid is a bacterial infection caused by Salmonella typhi, which spreads through contaminated food and water.

• The disease is commonly diagnosed using the Widal test, a serological test that detects antibodies against S. typhi antigens.

• The Widal test evaluates the presence of O (somatic) and H (flagellar) antigens in the blood, which are specific to typhoid fever.

• This method is preferred in areas with limited access to advanced diagnostic tools and is widely used for diagnosing typhoid in endemic regions.

• While the Widal test is widely used, its results must be interpreted cautiously alongside the patient’s clinical history and other diagnostic findings.

Additional Information

• Widal Test:

• Developed in 1896 by Georges-Fernand Widal, it remains one of the most common methods to diagnose typhoid fever.

• A fourfold increase in antibody titers in two consecutive samples taken 7–10 days apart confirms the diagnosis of typhoid.

• False-positive results may occur due to previous infections or vaccination with S. typhi.

• Other Diagnostic Methods for Typhoid:

• Blood Culture: The most reliable method, especially in the early stages of the disease.

• Bone Marrow Culture: Considered the most sensitive diagnostic method but is invasive and rarely used.

• Typhidot Test: A rapid diagnostic test that detects IgM and IgG antibodies specific to typhoid.

• Symptoms of Typhoid:

• High fever, abdominal pain, weakness, headache, loss of appetite, and constipation or diarrhea.

• In severe cases, it can lead to intestinal perforation and sepsis.

• Prevention of Typhoid:

• Vaccination: Typhoid conjugate vaccines and oral live-attenuated vaccines are available.

• Ensure safe drinking water, proper sanitation, and hygiene to prevent transmission.

Q28. Answer: (a) $72y^2$

Shortcut Trick

For two numbers a and b, the third proportional (c) is calculated as b^2 / a.

Given: $a = 2x^2$ and $b = 12xy$.

Third Proportional = $(12xy)^2 \div 2x^2$

=> $(144x^2y^2) \div 2x^2 = 72y^2$

Therefore The correct answer is $72y^2$.

Alternate Method

Given:

First term (a) = $2x^2$

Second term (b) = $12xy$

Formula Used:

If a, b, and c are in continued proportion, then a : b = b : c, where c is the third proportional.

=> a / b = b / c

Calculations:

=> $2x^2 / 12xy = 12xy / c$

=> $c = (12xy \times 12xy) / 2x^2$

=> $c = 144x^2y^2 / 2x^2$

=> $c = 72y^2$

Therefore The correct answer is $72y^2$.

Additional Information

Mean Proportional

The mean proportional between two numbers a and b is given by √(ab).

Fourth Proportional

For three numbers a, b, and c, the fourth proportional d is given by (b × c) / a such that a : b = c : d.

Continued Proportion

Three quantities a, b, c are in continued proportion if the ratio of the first to the second is equal to the ratio of the second to the third (a:b = b:c).

Q29. Answer: (b) 52

Shortcut Trick

Cost Price (CP) of 1 bag = 41,622 ÷ 42 = Rs. 991.

Selling Price (SP) of 1 bag = 37,345 ÷ 35 = Rs. 1,067.

Profit per bag = SP − CP = 1,067 − 991 = Rs. 76.

Number of bags required for total profit = Total Profit ÷ Profit per bag.

Number of bags = 3,952 ÷ 76 = 52.

Therefore The correct answer is 52 laptop bags.

Alternate Method

Given: Total CP of 42 bags = Rs. 41,622 | Total SP of 35 bags = Rs. 37,345 | Target Profit = Rs. 3,952.

Formulas: CP per unit = Total CP ÷ Quantity | SP per unit = Total SP ÷ Quantity | Profit per unit = SP − CP | Required Quantity = Total Profit ÷ Profit per unit.

=> Step 1: Calculate CP of one bag = 41,622 ÷ 42 = Rs. 991.

=> Step 2: Calculate SP of one bag = 37,345 ÷ 35 = Rs. 1,067.

=> Step 3: Calculate Profit per bag = 1,067 − 991 = Rs. 76.

=> Step 4: Calculate Number of bags = 3,952 ÷ 76 = 52.

Therefore The correct answer is 52 laptop bags.

Additional Information

Unitary Method in Profit and Loss

When buying and selling quantities are different, always find the Cost Price and Selling Price for a single unit (1 item) to simplify calculations.

Profit Percentage Calculation

Profit% = (Profit ÷ CP) × 100. In this case, Profit% = (76 ÷ 991) × 100 ≈ 7.67%.

Q30. Answer: (c) Sending scientists 6,000 meters underwater

The correct answer is Sending scientists 6,000 meters underwater.

Key Points

• Samudrayaan is India's first manned deep-sea mission aimed at sending a submersible vessel with scientists to explore the deep ocean at a depth of up to 6,000 meters.

• It is a part of the Deep Ocean Mission launched by the Ministry of Earth Sciences (MoES), Government of India.

• The submersible, named MATSYA 6000, is designed to carry three people and is equipped with advanced scientific instruments for deep-sea exploration.

• The mission is set to be completed by 2026 and aims to study deep-sea biodiversity, mineral resources, and the impact of climate change on the ocean ecosystem.

• Samudrayaan will position India among the elite nations like the USA, Russia, Japan, France, and China that have developed deep-sea manned submersible technologies.

Additional Information

• Deep Ocean Mission (DOM):

• The Deep Ocean Mission is a flagship initiative of the Ministry of Earth Sciences to explore the deep oceans and sustainably harness ocean resources.

• The mission consists of multiple components, including deep-sea mining, underwater robotics, and research on marine biodiversity.

• MATSYA 6000 Submersible:

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• MATSYA 6000 is an indigenously developed deep-sea submersible capable of diving to depths of 6,000 meters.
• It features a titanium alloy sphere to withstand extreme pressure and advanced imaging systems for underwater research.
• Potential Benefits:
• Exploration of polymetallic nodules, which are rich in minerals like manganese, nickel, cobalt, and copper.
• Understanding deep-sea ecosystems, which is crucial for biodiversity conservation and climate change research.
• Global Context:
• Countries like the USA (Alvin submersible), China (Jiaolong submersible), and Japan have advanced capabilities in manned deep-sea missions.
• Samudrayaan will help India achieve technological self-reliance in deep-sea exploration and research.

Q31. Answer: (c) 693

Given: 41 ÷ 19 + 448 × 4 − 26 = ?

According to the question, after '+' and '−' are interchanged and '×' and '÷' are interchanged:

41 ÷ 19 + 448 × 4 − 26 = ? => 41 × 19 - 448 ÷ 4 + 26 = ?

=> 41 × 19 - 448 ÷ 4 + 26 = ?

=> 41 × 19 - 112 + 26 = ?

=> 779 + 26 - 112 = ?

=> 805 - 112 = ?

=> 693 = ?

Hence, "Option 3" is the correct answer.

Q32. Answer: (b) National Remote Sensing Centre

The correct answer is National Remote Sensing Centre.

Key Points

• The Central Water Commission (CWC) has collaborated with the National Remote Sensing Centre (NRSC) to develop snowmelt runoff forecasting systems in Himalayan river basins.
• NRSC is a part of the Indian Space Research Organisation (ISRO) and is responsible for satellite data acquisition and remote sensing applications.
• The system uses advanced satellite-based remote sensing technology to monitor snow cover and predict water flow due to snowmelt in Himalayan rivers.
• The forecasting system aims to provide accurate data for managing water resources effectively, especially during peak snowmelt periods.
• This initiative plays a crucial role in mitigating water-related risks such as floods and ensuring sustainable water management in the region.

Additional Information

• National Remote Sensing Centre (NRSC)
• NRSC is a key wing of ISRO that specializes in acquiring, processing, and analyzing satellite imagery for various applications.
• It is involved in activities such as disaster management, environmental monitoring, and resource planning using remote sensing technologies.
• NRSC operates through a network of regional centers across India to cater to localized needs.
• Snowmelt Runoff
• Snowmelt runoff refers to the flow of water resulting from the melting of accumulated snow, particularly in mountainous regions.
• This phenomenon is a significant source of freshwater for rivers and streams, especially in regions like the Himalayas.
• Accurate forecasting helps in managing water resources and preventing flood risks in downstream areas.
• Himalayan River Basins
• The Himalayan river basins are major drainage systems originating from the Himalayan mountain range.
• Key rivers such as the Ganga, Brahmaputra, and Indus depend heavily on snowmelt for their water flow.
• Effective water management in these basins is essential for agriculture, drinking water, and hydropower generation.
• Remote Sensing Technology
• Remote sensing involves collecting and analyzing data from satellites or aircraft to monitor the Earth's surface.
• It plays a critical role in applications like weather forecasting, environmental monitoring, and resource mapping.
• Satellite imagery enables precise monitoring of snow cover, vegetation, and water bodies.

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Q33. Answer: (b) 1/2

Shortcut Trick

Given sin^4θ − cos^4θ = 1/2.

Using $a^2 - b^2 = (a - b)(a + b)$, we get $(\sin^2\theta - \cos^2\theta)(\sin^2\theta + \cos^2\theta) = 1/2$.

Since $\sin^2\theta + \cos^2\theta = 1$, the expression becomes $\sin^2\theta - \cos^2\theta = 1/2$.

We know that $\cos^2\theta = 1 - \sin^2\theta$, so $\sin^2\theta - (1 - \sin^2\theta) = 2\sin^2\theta - 1 = 1/2$.

Therefore The correct answer is 1/2.

Alternate Method

Given: sin^4θ − cos^4θ = 1/2

Formula Used: $a^4 - b^4 = (a^2 - b^2)(a^2 + b^2)$ and $\sin^2\theta + \cos^2\theta = 1$

$\Rightarrow (\sin^2\theta)^2 - (\cos^2\theta)^2 = 1/2$

$\Rightarrow (\sin^2\theta - \cos^2\theta)(\sin^2\theta + \cos^2\theta) = 1/2$

$\Rightarrow (\sin^2\theta - \cos^2\theta) \times 1 = 1/2$

$\Rightarrow \sin^2\theta - (1 - \sin^2\theta) = 1/2$

$\Rightarrow \sin^2\theta - 1 + \sin^2\theta = 1/2$

$\Rightarrow 2\sin^2\theta - 1 = 1/2$

Therefore The correct answer is 1/2.

Additional Information

Trigonometric Identity

The fundamental identity is $\sin^2\theta + \cos^2\theta = 1$, which can be rearranged as $\cos^2\theta = 1 - \sin^2\theta$ or $\sin^2\theta = 1 - \cos^2\theta$.

Double Angle Formulas

$\cos 2\theta = \cos^2\theta - \sin^2\theta = 1 - 2\sin^2\theta = 2\cos^2\theta - 1$. In this problem, $2\sin^2\theta - 1$ is equivalent to $-\cos 2\theta$.

Q34. Answer: (b) Both conclusions (I) and (II) follow.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

(I) Some flowers are trees→ Follow (As some trees are flowers. As some part of trees is common with flowers, therefore it is true.)

(II) Some beautiful are flowers → Follow (As all flowers are beautiful. As whole flowers comes in beautiful, therefore it is true.)

Therefore Here, Both conclusions (I) and (II) follow.

Hence, the correct answer is "Option 2"

Q35. Answer: (a) 932

The logic followed here is:

Hence, "Option 1" is the correct answer.

Q36. Answer: (d) $x^2 + x - 247 = 0$

Shortcut Trick

Let the smaller integer be x and the next consecutive integer be x + 1.

The product is given as $x \times (x + 1) = 247$.

Expanding the bracket: $x^2 + x = 247$.

Rearranging into standard quadratic form: $x^2 + x - 247 = 0$.

Therefore The correct answer is $x^2 + x - 247 = 0$.

Alternate Method

Given:

Smaller integer = x

Product of two consecutive positive integers = 247

Calculation:

Since the integers are consecutive, the second integer must be (x + 1).

According to the problem, the product of these integers is 247.

$\Rightarrow x \times (x + 1) = 247$

$\Rightarrow x(x) + x(1) = 247$

$\Rightarrow x^2 + x = 247$

To form the quadratic equation, move all terms to the left side:

=> $x^2 + x - 247 = 0$

This equation represents the relationship used to find the value of the smaller integer x.

Therefore The correct answer is $x^2 + x - 247 = 0$.

Additional Information

Consecutive Integers

Integers that follow each other in order without gaps. If the first is n, the next is n + 1, followed by n + 2, and so on.

Quadratic Equation Standard Form

A quadratic equation is typically written in the form $ax^2 + bx + c = 0$, where $a \neq 0$.

Consecutive Even or Odd Integers

If the integers are specified as even or odd, the difference between them is 2, represented as x and x + 2.

Nature of Roots

For the equation $ax^2 + bx + c = 0$, the discriminant $D = b^2 - 4ac$ determines if roots are real, equal, or imaginary.

Q37. Answer: (d) Access to clean drinking water

The correct answer is Access to clean drinking water.

Key Points

• The Gender Inequality Index (GII) is a composite index measuring disparities in achievements between men and women in three dimensions: reproductive health, empowerment, and labor market participation.

• Reproductive health is measured by maternal mortality ratio and adolescent birth rates.

• Empowerment is measured by the proportion of parliamentary seats held by women and the proportion of women and men aged 25 years and older with at least some secondary education.

• Labor market participation is assessed by the labor force participation rate of women compared to men.

• Access to clean drinking water is not considered a dimension in the Gender Inequality Index, as GII focuses on gender-specific inequalities rather than general living conditions.

Additional Information

• Gender Inequality Index (GII):

• Introduced by the United Nations Development Programme (UNDP) in its 2010 Human Development Report.

• It highlights areas where women are disadvantaged compared to men.

• The GII ranges from 0 (no inequality) to 1 (complete inequality).

• Reproductive Health Indicators:

• Maternal mortality ratio: The number of maternal deaths per 100,000 live births.

• Adolescent birth rate: The number of births per 1,000 women aged 15-19 years.

• Empowerment Indicators:

• Proportion of parliamentary seats held by women: Reflects political representation and decision-making power.

• Educational attainment: Tracks the percentage of women and men with at least some secondary education.

• Labor Force Participation:

• Compares the percentage of women and men actively engaged in the labor market.

• It includes both employed individuals and those actively seeking employment.

Q38. Answer: (c) Start Menu

The correct answer is Start Menu.

Key Points

• The Start Menu is an integral component of the Windows XP operating system, providing a graphical user interface for easy access to programs and applications.

• It allows users to open software, access system tools, search files, and navigate the computer's file structure efficiently.

• The Start Menu is typically located at the bottom-left corner of the desktop screen and can be accessed by clicking the "Start" button or pressing the Windows key.

• Introduced in earlier Windows versions, the Start Menu was enhanced in Windows XP to include features like a customizable list of frequently used programs and a search bar for quicker navigation.

• Windows XP's Start Menu can be configured in either the "Classic Start Menu" style for a traditional look or the default "XP style" for a more modern interface.

Additional Information

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• Task Manager:
• This tool allows users to view and manage running processes, applications, and system performance.
• It is primarily used for troubleshooting, ending unresponsive programs, and monitoring CPU, memory, and disk usage.
• Control Panel:
• The Control Panel is a centralized interface that allows users to adjust system settings such as network connections, display options, and user accounts.
• It provides access to administrative tools and hardware configurations.
• File Explorer:
• File Explorer, also called "Windows Explorer," is used to browse and manage files and folders on a computer.
• It enables users to copy, move, and delete files, as well as to navigate through the directory structure.
• Windows XP User Interface Enhancements:
• Windows XP introduced a new visual design called "Luna," which made the interface more user-friendly and visually appealing.
• Features like the Start Menu, Taskbar, and notification area were improved to enhance accessibility and usability.

Q39. Answer: (a) 6

According to the given information,

Thus, 'D' is coded as '6'.

Hence, "Option 1" is the correct answer.

Q40. Answer: (a) A devastating earthquake in Myanmar

The correct answer is A devastating earthquake in Myanmar.

Key Points

• Operation Brahma was launched by India in March 2025 as a humanitarian mission to assist Myanmar following a devastating earthquake.
• The earthquake caused widespread destruction in Myanmar, impacting thousands of lives and infrastructure.
• India, under its "Neighbourhood First Policy," swiftly responded with relief efforts, showcasing its commitment to regional cooperation and disaster management.
• The operation included the deployment of rescue teams, medical aid, and essential supplies to assist affected communities.
• India’s National Disaster Response Force (NDRF) and other agencies played a critical role in the success of Operation Brahma.

Additional Information

• Neighbourhood First Policy:
• India’s foreign policy framework that prioritizes relations with neighboring countries to enhance regional cooperation and development.
• Emphasizes economic integration, cultural ties, and mutual assistance in times of need.
• National Disaster Response Force (NDRF):
• A specialized force in India established for disaster management under the Disaster Management Act, 2005.
• Equipped and trained to handle natural and man-made disasters, including earthquakes, floods, and industrial accidents.
• India-Myanmar Relations:
• India and Myanmar share a 1,643 km-long border and have strong cultural, historical, and economic ties.
• India has consistently supported Myanmar during crises, strengthening bilateral relations.
• Earthquake Preparedness:
• Measures include building earthquake-resistant infrastructure, conducting regular disaster preparedness drills, and promoting public awareness.
• India’s efforts in assisting Myanmar highlight the importance of international cooperation in disaster management.

Q41. Answer: (d) 6.0 per cent

The correct answer is 6.0 per cent.

Key Points

• The Monetary Policy Committee (MPC) in 2025 reduced the policy repo rate under the Liquidity Adjustment Facility (LAF) by 25 basis points to 6.0 per cent.
• Repo rate is the interest rate at which the Reserve Bank of India (RBI) lends money to commercial banks to meet their short-term funding requirements.
• This reduction is often aimed at encouraging borrowing and investment to stimulate economic growth.
• Changes in the repo rate are a key monetary policy tool used by the RBI to control inflation and ensure liquidity in the market.

• The decision of the MPC is influenced by prevailing economic conditions such as inflation, GDP growth, and global financial trends.

Additional Information

• Monetary Policy Committee (MPC):
• The MPC is a statutory body constituted under the Reserve Bank of India Act, 1934, to decide the policy interest rates.
• It consists of six members: three from the RBI and three external members appointed by the Government of India.
• The MPC meets bi-monthly to review and set the repo rate based on inflation and other economic indicators.
• Liquidity Adjustment Facility (LAF):
• LAF is a monetary policy tool that allows banks to borrow money through repurchase agreements.
• It consists of repo and reverse repo operations to regulate liquidity and short-term interest rates in the economy.
• Inflation Targeting:
• The RBI's primary mandate is to keep inflation within the target range set by the Government of India.
• As of recent guidelines, the inflation target is 4% with a tolerance band of ±2%.
• Impact of Repo Rate Changes:
• A reduction in repo rate lowers borrowing costs for businesses and individuals, boosting economic activity.
• An increase in repo rate helps curb inflation but may slow down economic growth.
• Current Economic Trends:
• Global financial conditions, geopolitical tensions, and domestic inflation trends often influence MPC decisions.
• The repo rate decision is a balance between supporting growth and ensuring price stability.

Q42. Answer: (a) 7 km towards the west

Given:

Mr. O starts from Point L and drives 3 km towards the south.

He then takes a left turn, drives 3 km, turns right and drives 4 km.

He then takes a left turn and drives 4 km.

He takes a final left turn, drives 7 km and stops at Point M.

Thus, Mr. O should drive 7 km (3 km + 4 km) in the west direction in order to reach Point L again.

Hence, "Option 1" is the correct answer.

Q43. Answer: (c) Central Highlands

The correct answer is Central Highlands.

Key Points

• The region lying to the north of the Narmada River is referred to as the Central Highlands.
• The Central Highlands are bounded by the Aravalli Hills in the northwest and the Vindhyan Range to the south.
• This region is part of the northern extension of the Peninsular Plateau of India.
• The Central Highlands include the Malwa Plateau and parts of Madhya Pradesh, Rajasthan, and Uttar Pradesh.
• The rivers in this region primarily flow from the south to the north due to the slope of the plateau.

Additional Information

• Narmada River
• The Narmada River is considered the traditional boundary separating North and South India.
• It flows westward, unlike most other rivers in India, which flow eastward.
• The Narmada originates from the Amarkantak Plateau in Madhya Pradesh and drains into the Arabian Sea.
• Vindhyan Range
• The Vindhyan Range acts as a southern boundary for the Central Highlands.
• It is one of the oldest mountain ranges in India, predominantly made of sandstone.
• It plays a significant role in separating the Indo-Gangetic Plains from the Deccan Plateau.
• Aravalli Range
• The Aravalli Range, located in northwestern India, is one of the oldest fold mountains in the world.
• It forms the northwestern boundary of the Central Highlands.
• The range is known for its rich mineral deposits and biodiversity.
• Peninsular Plateau
• The Peninsular Plateau is the oldest landmass of India, formed during the Precambrian era.

• It is divided into two major parts: the Central Highlands and the Deccan Plateau.
• This plateau is rich in natural resources, including minerals, forests, and fertile soil.

Q44. Answer: (c) 1,795.2

Shortcut Trick
Total interest percentage = Rate × Time = 6% × 6 = 36%.
Total amount percentage = 100% + 36% = 136%.
Amount = 1320 × 136% = 1320 × 1.36 = Rs. 1,795.2.
Therefore The correct answer is Rs. 1,795.2.
Alternate Method
Given:
Principal (P) = Rs. 1,320
Rate (R) = 6% per annum
Time (T) = 6 years
Formula Used:
Simple Interest (SI) = (P × R × T) ÷ 100
Total Amount (A) = Principal (P) + Simple Interest (SI)
Calculations:
=> SI = (1320 × 6 × 6) ÷ 100
=> SI = (1320 × 36) ÷ 100
=> SI = 47520 ÷ 100 = Rs. 475.2
=> Total Amount = 1320 + 475.2
=> Total Amount = Rs. 1,795.2
Therefore The correct answer is Rs. 1,795.2.
Additional Information
Direct Amount Formula (SI)
The final amount can be calculated directly using A = P(1 + RT/100).
Relationship between Interest and Time
In Simple Interest, the interest earned remains constant every year if the principal and rate are unchanged.
SI vs CI Difference
For the first year, Simple Interest and Compound Interest are identical if the interest is compounded annually.

Q45. Answer: (b) 10 hours

Shortcut Trick
Net filling time = (a × b) ÷ (b − a), where a = filling time and b = emptying time.
Net filling time = (6 × 15) ÷ (15 − 6)
Net filling time = 90 ÷ 9 = 10 hours.
Therefore The correct answer is 10 hr.
Alternate Method
Given:
Time taken by Tap (A) to fill = 6 hours
Time taken by Hole (B) to empty = 15 hours

Source	Time (hr)	Total Capacity (LCM)	Efficiency
Tap (A)	6	30 units	+5
Hole (B)	15	−2	

Calculations:
=> Total Capacity = LCM(6, 15) = 30 units
=> Efficiency of Tap (A) = 30 ÷ 6 = +5 units/hr
=> Efficiency of Hole (B) = 30 ÷ 15 = −2 units/hr
=> Combined Efficiency (A + B) = 5 − 2 = 3 units/hr
=> Time taken to fill the cistern = Total Capacity ÷ Combined Efficiency

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=> Time = 30 ÷ 3 = 10 hours

Therefore The correct answer is 10 hr.

Additional Information

Inlet and Outlet Pipes

An inlet pipe fills the tank (positive efficiency), while an outlet pipe (or leak) empties the tank (negative efficiency).

Net Work Done

If 1/x is the filling rate and 1/y is the emptying rate, net work per hour = 1/x − 1/y (when filling is faster).

Pipes & Cisterns Analogy

This concept is identical to Time & Work, where filling is positive work and emptying/leaking is negative work.

Q46. Answer: (c) 8

Shortcut Trick

For a number to be divisible by 8, its last three digits must be divisible by 8.

Last three digits of 43377p08 are p08.

Checking the maximum value of p from the options: p = 8.

The number 808 is divisible by 8 (808 ÷ 8 = 101).

Therefore The correct answer is 8.

Alternate Method

Given: An eight-digit number 43377p08 is divisible by 8.

Divisibility Rule of 8: A number is divisible by 8 if the number formed by its last three digits is divisible by 8.

=> Last three digits = p08

=> We need to find the maximum digit p in {0, 1, 2, 3, 4, 5, 6, 7, 8, 9} such that 100p + 08 is divisible by 8.

=> If p = 9, 908 ÷ 8 => Remainder = 4 (Not divisible)

=> If p = 8, 808 ÷ 8 = 101 (Divisible)

=> Since 8 is the largest digit satisfying the condition among the options, it is the maximum value.

Therefore The correct answer is 8.

Additional Information

Divisibility by 4

A number is divisible by 4 if its last two digits are divisible by 4.

Divisibility by 16

A number is divisible by 16 if its last four digits are divisible by 16.

Combined Rule

For 2^n, check the last n digits of the number for divisibility.

Q47. Answer: (b) Only 2 and 3

The correct answer is Option 2: Only 2 and 3.

Key Points

• Parvesh Verma defeated Arvind Kejriwal in the New Delhi Assembly constituency during the 2024 Delhi Assembly elections.

• He was subsequently elected as the Deputy Chief Minister of Delhi, marking a significant political shift.

• The Aam Aadmi Party (AAP) secured 22 seats in the 2024 Delhi Assembly elections, showing a decrease compared to the previous election.

• The Indian National Congress improved its seat tally, indicating a revival of its political presence in Delhi.

• The candidate with the largest winning margin did not belong to the BJP, ruling out Option 1.

Additional Information

• Delhi Assembly Elections Overview:

• The Delhi Legislative Assembly consists of 70 seats, and elections are held every five years.

• Major political parties contesting include AAP, BJP, and INC.

• The party with a majority (36 or more seats) forms the government.

• Role of Deputy Chief Minister:

• Deputy Chief Minister acts as the second-in-command in the state government.

• Responsible for assisting the Chief Minister in governance and managing specific portfolios.

• Impact of Seat Tally Reduction:

• AAP's reduced seat tally may reflect a shift in voter sentiment.

• It could lead to re-evaluation of policies and strategies by the party.

• Congress Revival:

• Improved performance in the elections could indicate efforts to regain political ground in Delhi.

• Revival strategies often include grassroots campaigns and leadership changes.

Q48. Answer: (d) Canada

The correct answer is Canada.

Key Points

• Canada assumed the presidency of the G7 in January 2025, taking over from the prior presidency country.

• The G7 (Group of Seven) is an intergovernmental organization consisting of the world's largest advanced economies, including the US, UK, Canada, France, Germany, Italy, and Japan.

• The presidency of the G7 rotates annually among its member countries, giving each the responsibility of hosting the annual summit and setting the agenda for global discussions.

• As the president, Canada is expected to focus on key issues such as climate change, global economic stability, and international security.

• The 2025 G7 Summit, under Canada's leadership, will bring together heads of state and government to discuss and coordinate policies on pressing global challenges.

Additional Information

• G7 Overview:

• The G7 was established in 1975 as a forum for the world's leading industrialized nations to discuss and coordinate economic policies.

• The group addresses global issues such as trade, climate change, development, and security.

• Unlike the G20, the G7 does not include emerging economies like China, India, or Brazil.

• Canada's Role in the G7:

• Canada joined the G7 in 1976, one year after its formation, and has hosted the summit several times, most recently in 2018.

• The country is known for championing issues like environmental sustainability, gender equality, and global health during its presidencies.

• Structure of the G7 Presidency:

• The presidency is responsible for organizing the annual summit, ministerial meetings, and setting the group’s agenda for the year.

• The host country works closely with other member states to ensure consensus on key issues.

• 2025 G7 Agenda:

• Although the official agenda is yet to be finalized, Canada is expected to prioritize climate action, energy transition, and global economic recovery.

• Other topics may include strengthening global health systems and addressing food security.

Q49. Answer: (b) 1^(st) century AD

The correct answer is 1st century AD.

Key Points

• The Periplus of the Erythraean Sea is a Greco-Roman navigational text written in the 1st century AD.

• It provides detailed information about trade routes, ports, and commodities traded across the Red Sea, Arabian Sea, and Indian Ocean.

• The text is believed to have been authored by an anonymous Greek merchant or sailor.

• It serves as a crucial historical source for understanding maritime trade and cultural exchanges between the Roman Empire, India, East Africa, and Arabian regions.

• The document mentions Muziris, an important port on the southwestern coast of India, highlighting India's significance in ancient trade networks.

Additional Information

• Periplus:

• A "Periplus" is a type of navigational text used by ancient sailors and traders to describe coastlines, ports, and trade routes.

• The term is derived from the Greek word "periplous," meaning "sailing around."

• Erythraean Sea:

• The term "Erythraean Sea" in ancient texts refers to the body of water encompassing the Red Sea, Arabian Sea, and parts of the

Indian Ocean.

• It was a crucial region for maritime trade connecting Europe, Africa, and Asia.

• Muziris:

• Muziris, located in present-day Kerala, India, was a key port mentioned in the Periplus.

• It was famous for exporting spices, pearls, ivory, and textiles to the Roman Empire.

• Impact of the Periplus:

• The text offers insights into ancient international trade, cultural exchange, and economic systems.

• It highlights the interconnectedness of civilizations during the 1st century AD.

Q50. Answer: (b) 16 and −16

Shortcut Trick

For a quadratic equation $ax^2 + bx + c = 0$ to have equal real roots, the value of b is given by $\pm 2\sqrt{(ac)}$.

$\Rightarrow b = \pm 2 \sqrt{(4 \times 16)}$

$\Rightarrow b = \pm 2 \sqrt{64}$

$\Rightarrow b = \pm 2 \times 8 = \pm 16$

Therefore The correct answer is 16 and −16.

Alternate Method

Given: The quadratic equation is $4x^2 + bx + 16 = 0$.

Formula Used: For equal real roots, the discriminant (D) of the equation $ax^2 + bx + c = 0$ must be zero.

$D = b^2 - 4ac = 0$

Calculations:

$\Rightarrow$ Comparing $4x^2 + bx + 16 = 0$ with $ax^2 + bx + c = 0$, we get:

$\Rightarrow a = 4, b = b, c = 16$

$\Rightarrow D = b^2 - 4 \times 4 \times 16 = 0$

$\Rightarrow b^2 - 256 = 0$

$\Rightarrow b^2 = 256$

$\Rightarrow b = \sqrt{256}$

$\Rightarrow b = 16$ or $b = -16$

Therefore The correct answer is 16 and −16.

Additional Information

Nature of Roots

The discriminant $D = b^2 - 4ac$ determines the nature: if $D > 0$, roots are real and distinct; if $D = 0$, roots are real and equal; if $D < 0$, roots are imaginary.

Sum and Product of Roots

For a quadratic equation, the sum of roots is $-b/a$ and the product of roots is c/a.

Perfect Square Condition

A quadratic expression is a perfect square if and only if its discriminant is zero, which results in equal roots.

Q51. Answer: (c) North

Given:

Town N is to the east of Town O.

Town P is to the north of Town N.

Town Q is to the south of Town P.

Town R is to the west of Town Q.

Town O is to the north-east of Town R.

Thus, Town N is to the north of Town Q.

Hence, "Option 3" is the correct answer.

Q52. Answer: (b) Press Shift + Delete

The correct answer is Press Shift + Delete.

Key Points

• Pressing Shift + Delete bypasses the Recycle Bin and permanently deletes a file from the system.

• This action removes the file from the file system table, making it inaccessible to the user unless recovery methods are employed.

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• The Recycle Bin is a feature in Windows OS that stores deleted files temporarily until manually cleared.
• Files deleted using Shift + Delete cannot be restored through the Recycle Bin.
• For accidental permanent deletion, specialized data recovery software may be required to retrieve the file.
Additional Information
• Recycle Bin in Windows OS
• The Recycle Bin is a special folder where deleted files are temporarily stored.
• Users can restore files from the Recycle Bin unless the bin has been emptied or files are deleted permanently using Shift + Delete.
• The Recycle Bin can be customized to allocate a specific amount of storage space for deleted files.
• Permanent Deletion
• Permanent deletion bypasses temporary storage locations like the Recycle Bin.
• It removes file references from the file system, but the actual data remains on the storage device until overwritten.
• Tools like disk shredders can be used to overwrite deleted files, ensuring complete erasure.
• Data Recovery
• Data recovery tools like EaseUS or Recuva can retrieve files that have been deleted permanently, provided the data has not been overwritten.
• Recovery is more successful if attempted promptly after deletion.
• Keyboard Shortcuts in Windows
• Shift + Delete: Permanently deletes a file without sending it to the Recycle Bin.
• Ctrl + C and Ctrl + V: Copy and paste files or content.
• Alt + Tab: Switch between open windows.
• Ctrl + Z: Undo the last action.

Q53. Answer: (d) Rs. 79,380

Shortcut Trick
For half-yearly compounding, the rate becomes half (5%) and time periods double (2 periods).
Effective interest rate for 2 periods at 5% = 5 + 5 + (5 × 5)/100 = 10.25%.
Total Amount = 110.25% of Rs. 72,000.
=> Amount = 72,000 × 1.1025 = Rs. 79,380.
Therefore The correct answer is Rs. 79,380.
Alternate Method
Given: Principal (P) = Rs. 72,000, Rate (R) = 10% p.a., Time (T) = 1 year.
Formula Used: Amount (A) = $P(1 + r/100)^n$
Since the interest is compounded half-yearly:
=> New Rate (r) = 10% ÷ 2 = 5% per half-year.
=> Total periods (n) = 1 year × 2 = 2 half-years.
=> $A = 72,000 \times (1 + 5/100)^2$
=> $A = 72,000 \times (105/100) \times (105/100)$
=> $A = 72,000 \times (21/20) \times (21/20)$
=> $A = (72,000 \div 400) \times 441$
=> $A = 180 \times 441$
=> A = Rs. 79,380
Therefore The correct answer is Rs. 79,380.
Additional Information
Compounding Frequency Rules
For Half-yearly compounding, Rate = R/2 and Time = 2T. For Quarterly compounding, Rate = R/4 and Time = 4T.
Effective Rate Formula
Effective Rate for 2 periods = x + y + (xy/100)%, where x and y are the rates for each period.
CI vs SI Difference
The difference between CI and SI for 2 years (or 2 periods) is given by $D = P(r/100)^2$.

Q54. Answer: (a) COPE - ECPO - CEOP

The logic followed here is:

REAL - LRAE - RLEA

And,

MAKE - EMKA - MEAK

Similarly,

Option 1) COPE - ECPO - CEOP

Hence, "Option 1" is the correct answer.

Q55. Answer: (d) 25°

Shortcut Trick

In a quadrilateral, the angle formed by the bisectors of two adjacent angles is half the sum of the other two angles.

=> angle STR = (angle P + angle Q) ÷ 2

=> 32.5° = (angle P + angle Q) ÷ 2 => angle P + angle Q = 65°

=> Ratio angle P : angle Q = 4 : 9 => Total units = 13

=> 13 units = 65° => 1 unit = 5°

=> Difference = (9 − 4) × 5° = 25°

Therefore The correct answer is 25°.

Alternate Method

Given: angle STR = 32.5°, Ratio of angle P to angle Q = 4 : 9.

Formula Used: Sum of interior angles of a quadrilateral = 360°.

=> In ΔSTR, angle TSR + angle TRS + angle STR = 180°

=> Since ST and RT are angle bisectors, angle TSR = angle S/2 and angle TRS = angle R/2

=> (angle S/2) + (angle R/2) + 32.5° = 180°

=> (angle S + angle R) ÷ 2 = 180° − 32.5° = 147.5°

=> angle S + angle R = 295°

=> angle P + angle Q + angle R + angle S = 360°

=> angle P + angle Q + 295° = 360° => angle P + angle Q = 65°

=> Let angle P = 4x and angle Q = 9x

=> 4x + 9x = 65° => 13x = 65° => x = 5°

=> Difference = 9x − 4x = 5x = 5 × 5° = 25°

Therefore The correct answer is 25°.

Additional Information

Angle Bisector Property in Quadrilaterals

The angle between the bisectors of two adjacent angles of a quadrilateral is equal to half the sum of the remaining two angles.

Sum of Interior Angles

For any polygon with n sides, the sum of interior angles is (n − 2) × 180°. For a quadrilateral (n=4), the sum is 360°.

Ratio and Difference

If two quantities are in ratio a : b and their sum is S, the difference between them is |a − b| × [S ÷ (a + b)].

Q56. Answer: (d) 40%

The correct answer is 0.4.

Key Points

• According to the Economic Survey 2023-24, 40% of India's population is projected to reside in urban areas by 2030.

• This reflects a trend of increasing urbanization, with a growing migration of people from rural to urban areas in search of employment and better living standards.

• India's urban population stood at around 31% in 2011, highlighting a significant rise in urbanization over two decades.

• The government has been focusing on urban development through initiatives like the Smart Cities Mission and AMRUT (Atal Mission for Rejuvenation and Urban Transformation).

• Rapid urbanization poses challenges such as housing, infrastructure, and environmental sustainability, which the government aims to address through planned urban development.

Additional Information

• Urbanization in India

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• Urbanization refers to the increasing proportion of a country's population living in urban areas.
• Factors driving urbanization include industrialization, better healthcare, and education facilities in cities.
• Challenges of urbanization include traffic congestion, inadequate infrastructure, and urban poverty.
• Smart Cities Mission
• Launched by the Government of India in 2015, the Smart Cities Mission aims to promote sustainable and inclusive urban development.
• The mission includes projects like smart transportation, efficient energy management, and e-governance systems.
• AMRUT (Atal Mission for Rejuvenation and Urban Transformation)
• AMRUT was launched in 2015 to improve infrastructure in urban areas, focusing on water supply, sewerage, and public transportation.
• The mission emphasizes the development of basic services to improve the quality of life for all, especially the poor and disadvantaged.
• Urban Challenges in India
• India faces urban challenges such as slums, inadequate public transport, and environmental degradation.
• Government policies aim to address these through integrated urban planning and sustainable development practices.

Q57. Answer: (d) Mangalore

The correct answer is Mangalore.

Key Points

• Mangalore Port is located in the state of Karnataka along the West Coastal Plain of India.
• It is a major port situated on the Arabian Sea, primarily used for the export of iron ore, coffee, spices, and other goods.
• The port is officially known as New Mangalore Port and is one of the 12 major ports in India.
• Mangalore's strategic location on the west coast makes it a crucial hub for maritime trade and economic activities in the region.
• It plays a key role in connecting Karnataka and its industries to global markets, particularly through its well-developed infrastructure and facilities.

Additional Information

• West Coastal Plain of India
• It lies between the Western Ghats and the Arabian Sea, extending from Gujarat in the north to Kerala in the south.
• The plain is divided into three sections: the Konkan Coast (Maharashtra-Goa), the Kanara Coast (Karnataka), and the Malabar Coast (Kerala).
• It is known for its fertile soil, lush greenery, and a significant number of ports facilitating maritime trade.
• Other Major Ports on the West Coast
• Mumbai Port and Jawaharlal Nehru Port (Maharashtra)
• Kandla Port (Gujarat)
• Cochin Port (Kerala)
• Role of Ports in Indian Economy
• Ports play a critical role in India's international trade, handling approximately 95% of the country's trade volume by weight.
• The west coast ports are particularly significant due to their proximity to Europe, the Middle East, and Africa.
• Arabian Sea
• The Arabian Sea is a part of the northern Indian Ocean, bordered by India, Pakistan, and Iran.
• It is a key route for international maritime trade, connecting the Indian subcontinent to global markets.

Q58. Answer: (a) Magnetic fields are completely expelled from the interior of the material.

The correct answer is Magnetic fields are completely expelled from the interior of the material..

Key Points

• The Meissner effect is a defining property of superconductors where magnetic fields are expelled from the interior of the material during the transition to the superconducting state.
• This phenomenon occurs below a critical temperature (Tc) unique to each superconducting material.
• The expulsion of magnetic fields is a result of the superconducting material forming perfect diamagnetic properties.
• As the superconducting state is achieved, the material cancels the internal magnetic field by generating surface currents that oppose the applied magnetic field.
• It is distinct from perfect conductivity, as it implies both zero electrical resistance and zero magnetic field within the material.

Additional Information

• Superconductivity:

• Superconductivity is a quantum mechanical phenomenon where certain materials exhibit zero electrical resistance and expel magnetic fields below a critical temperature.

• It was discovered in 1911 by Heike Kamerlingh Onnes in mercury cooled to 4.2 K.

• Applications include MRI machines, particle accelerators, and quantum computing.

• Meissner Effect:

• Named after Walther Meissner and Robert Ochsenfeld, who discovered it in 1933.

• It demonstrates the fundamental difference between superconductors and perfect conductors.

• The magnetic field is expelled entirely from the bulk of the material, not just reduced.

• Type I vs Type II Superconductors:

• Type I superconductors completely expel magnetic fields and are typically elemental metals.

• Type II superconductors allow partial penetration of magnetic fields in the form of vortices and are often alloys or compounds.

• Critical Temperature (Tc):

• The temperature below which a material becomes superconducting.

• Varies widely among materials, from below 1 K in some metals to above 100 K in high-temperature superconductors.

Q59. Answer: (d) SA −10

The logic followed here is:

RR 14 is related to UN 3

And,

BV 10 is related to ER −1

Similarly,

PE 1 is related to

Hence, "Option 4" is the correct answer.

Q60. Answer: (c) Barabati Fort, Cuttack, Odisha

The correct answer is Barabati Fort, Cuttack, Odisha.

Key Points

• The central celebration of Parakram Diwas to mark the 128th birth anniversary of Subhas Chandra Bose was held at Barabati Fort, Cuttack, Odisha in January 2025.

• Parakram Diwas is observed annually on January 23rd to honor the birth anniversary of Netaji Subhas Chandra Bose, one of India’s most prominent freedom fighters.

• Cuttack, Odisha, is the birthplace of Subhas Chandra Bose, making it a historically significant location for this celebration.

• The event included cultural programs, exhibitions, and tributes to commemorate Netaji's contributions to India’s independence struggle.

• Barabati Fort, a historical site in Cuttack, served as a symbolic venue for this national event, emphasizing Netaji's connection to the region.

Additional Information

• Subhas Chandra Bose

• Born on January 23, 1897, in Cuttack, Odisha, Bose is remembered for his role in India's freedom struggle.

• He was the founder of the Indian National Army (INA), which sought to overthrow British rule in India.

• He was famously referred to as "Netaji", meaning "Respected Leader".

• His famous slogan "Give me blood, and I will give you freedom" inspired countless Indians to join the independence movement.

• Parakram Diwas

• Introduced by the Government of India in 2021, the day is celebrated to inspire citizens with the spirit of patriotism.

• The announcement of this day was part of the 125th birth anniversary celebration of Subhas Chandra Bose.

• The day sees national-level programs, speeches, and events dedicated to Netaji’s legacy.

• Barabati Fort

• Located in Cuttack, Odisha, the Barabati Fort is a 14th-century fort built by the Ganga dynasty.

• The fort is of immense historical and cultural significance, symbolizing Odisha's rich heritage.

• Its selection as the venue for Parakram Diwas highlights the historical connection of the region to Subhas Chandra Bose.

• Netaji's Legacy

• Netaji Subhas Chandra Bose's efforts focused on uniting Indians across communities to fight for independence.

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• He strongly believed in the concept of armed resistance against colonial rule.

• His leadership of the INA and his collaboration with Axis powers during World War II remain topics of extensive discussion and research.

Q61. Answer: (d) KG-MI-PR

The logic followed here is:

EA-GC-JL

And,

GC-IE-LN

Similarly,

Option 4) KG-MI-PR

Hence, "Option 4" is the correct answer.

Q62. Answer: (d) (42, 1176, 14)

The logic followed here is:

(25, 900, 18) → 25 × 18 × 2 = 900

And,

(23, 874, 19) → 23 × 19 × 2 = 874

Similarly,

Option 1) (49, 1575, 16) → 49 × 16 × 2 = 1568 ≠ 1575

Option 2) (40, 807, 10) → 40 × 10 × 2 = 800 ≠ 807

Option 3) (30, 1147, 19) → 30 × 19 × 2 = 1140 ≠ 1147

Option 4) (42, 1176, 14) → 42 × 14 × 2 = 1176

Hence, "Option 4" is the correct answer.

Q63. Answer: (d) Ghuar Mota

The correct answer is Ghuar Mota.

Key Points

• Ghuar Mota is the westernmost inhabited village in India, located in the Kutch district of Gujarat.

• It is geographically situated near the Arabian Sea and lies close to the Indo-Pakistan border.

• This village is part of the Lakhpat taluka, which is known for its strategic location and historical significance.

• The region is sparsely populated, and its geographical significance stems from its position as India's westernmost settlement.

• Ghuar Mota holds strategic importance due to its proximity to the border and is part of the coastal surveillance system.

Additional Information

• Kutch District:

• Kutch is the largest district in India, located in the state of Gujarat.

• The district is known for its white salt desert, known as the Great Rann of Kutch, and its cultural heritage.

• It shares a significant portion of India's western border with Pakistan.

• Indo-Pakistan Border:

• The border between India and Pakistan runs for approximately 3,323 kilometers.

• The western border areas, including Gujarat, are closely monitored for security purposes.

• The region is equipped with advanced surveillance systems to ensure national security.

• Lakhpat Taluka:

• Lakhpat taluka is a subdivision in the Kutch district and holds historical importance as a once-thriving port town.

• The taluka is sparsely populated and is known for its proximity to the westernmost point of India.

• Westernmost Point of India:

• The westernmost point of India is located in the Sir Creek area of Gujarat.

• Ghuar Mota is the westernmost inhabited village in India, while the uninhabited westernmost point lies further west.

Q64. Answer: (a) 542

Given: 45 ÷ 12 − 75 × 5 + 13 = ?

According to the question, after '+' and '−' are interchanged and '×' and '÷' are interchanged:

45 ÷ 12 − 75 × 5 + 13 = ? => 45 × 12 + 75 ÷ 5 - 13 = ?

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=> 45 × 12 + 75 ÷ 5 - 13 = ?

=> 45 × 12 + 15 - 13 = ?

=> 540 + 15 - 13 = ?

=> 555 - 13 = ?

=> 542 = ?

Hence, "Option 1" is the correct answer.

Q65. Answer: (b) Co-operative Society Members

The correct answer is Co-operative Society Members.

Key Points

• Co-operative societies operate on the principle of mutual benefit and are primarily accountable to their members, who are both owners and stakeholders.

• Members of a co-operative society participate in decision-making and elect representatives to manage the society's operations.

• The accountability structure ensures democratic governance, with each member having equal voting rights regardless of their financial contribution.

• Co-operative societies are formed under the Co-operative Societies Act, which mandates that the society's primary focus should be serving its members' interests.

• Transparency in financial and operational matters is a key requirement to uphold members' trust and ensure accountability.

Additional Information

• Co-operative Society Definition:

• A co-operative society is a voluntary association of individuals united to meet common economic, social, or cultural needs and aspirations through a jointly-owned enterprise.

• It operates based on principles of mutual cooperation, democratic control, and equitable distribution of benefits.

• Key Principles of Co-operatives:

• Voluntary and open membership.

• Democratic member control (one member, one vote).

• Member economic participation.

• Autonomy and independence.

• Education, training, and information dissemination for members.

• Legal Framework:

• Co-operative societies are regulated under state-specific Co-operative Societies Acts or the Multi-State Co-operative Societies Act, 2002 (for societies operating across multiple states).

• They are registered with the Registrar of Co-operative Societies, who ensures compliance with statutory requirements.

• Types of Co-operative Societies:

• Consumer Co-operatives: Focus on retailing goods at fair prices.

• Producer Co-operatives: Serve the interests of producers by enabling joint production or marketing.

• Credit Co-operatives: Provide financial services to members, such as loans and savings facilities.

• Housing Co-operatives: Help members secure affordable housing solutions.

• Importance of Co-operative Societies:

• Promote self-reliance and economic independence among members.

• Encourage equitable distribution of wealth and resources.

• Foster community development and social cohesion.

• Serve as a tool for poverty alleviation and empowerment of marginalized groups.

Q66. Answer: (c) 1

Given series: (Left) £ @ 5 6 3 © & 4 9 % * $ $ % 6 & # & € © 5 8 (Right)

According to the question,

Required condition: Symbol - Number - Symbol

(Left) £ @ 5 6 3 © & 4 9 % * $ $ % 6 & # & € © 5 8 (Right)

Thus, there is one such number which is immediately preceded by a symbol and also immediately followed by a symbol.

Hence, "Option 3" is the correct answer.

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Q67. Answer: (a) S

Given: A, B, C, D, R, S and T are sitting around a circular table facing the centre of the table.

1) S sits fourth to the left of C.

2) Only two people sit between C and A when counted from the left of C.

3) R sits fourth to the right of A.

4) D is not an immediate neighbour of R or C.

5) B is not an immediate neighbour of D.

After positioning B only one position is left which will be occupied by the only person left i.e. T.

Thus, S sits fourth to the right of T.

Hence, "Option 1" is the correct answer.

Q68. Answer: (d) 1726

The correct answer is 1726.

Key Points

• The Municipal Corporations of Calcutta (now Kolkata) and Bombay (now Mumbai) were established in the year 1726.

• They were formed under the provisions of the Charter of 1726, issued by the British East India Company.

• This Charter led to the establishment of a Mayor's Court and municipal governance systems in these cities.

• The primary objective was to improve urban administration and cater to the needs of a growing British population in these trading hubs.

• These were among the earliest attempts at formal municipal governance in India during the colonial period.

Additional Information

• Charter of 1726:

• It was issued by King George I of Britain at the request of the British East India Company.

• The Charter introduced a system of civil and criminal courts in the presidency towns of Bombay, Calcutta, and Madras.

• This laid the foundation for modern municipal governance in India.

• Municipal Governance in Colonial India:

• The British introduced municipal governance to ensure better administration, sanitation, and urban development in growing cities.

• Municipal corporations were primarily established in trading centers like Bombay, Madras, and Calcutta.

• Evolution of Urban Local Bodies:

• The Indian Councils Act of 1861 and 1882 further developed local self-governance in India.

• In 1882, Lord Ripon, known as the “Father of Local Self-Government in India,” introduced reforms to make municipal bodies more representative.

• Current Status:

• Today, municipal corporations in India operate under the provisions of the 74th Constitutional Amendment Act (1992).

• This amendment provides constitutional status to Urban Local Bodies (ULBs) for decentralized governance.

Q69. Answer: (b) Pradhan Mantri Awaas Yojana - Gramin

The correct answer is Pradhan Mantri Awaas Yojana - Gramin.

Key Points

• Pradhan Mantri Awaas Yojana - Gramin (PMAY-G) is a rural housing scheme aimed at providing pucca houses to economically weaker sections in rural areas.

• The scheme uses Socio-Economic and Caste Census (SECC) data to identify beneficiaries based on deprivation criteria such as housing conditions, income, and social parameters.

• Launched in 2016, the scheme targets households without housing or living in kutcha houses with zero, one, or two rooms.

• The scheme aims to achieve its goal of "Housing for All by 2022" by constructing around 2.95 crore houses in rural areas.

• Under PMAY-G, financial assistance of up to Rs. 1.2 lakh in plain areas and Rs. 1.3 lakh in hilly or difficult terrains is provided to beneficiaries.

Additional Information

• Socio-Economic and Caste Census (SECC) 2011:

• SECC 2011 was conducted to gather comprehensive data on socio-economic status, income, and caste details of households in India.

• The census serves as a critical tool for identifying beneficiaries of various government schemes and programs.

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• It includes data on housing deprivation, occupational status, and other parameters to ensure targeted interventions.

• SECC data is widely used in programs like PMAY-G, Ayushman Bharat, and others to ensure transparency and fairness in beneficiary selection.

• Housing for All by 2022:

• This is a flagship mission launched by the Indian government to address the housing deficit in both urban and rural areas.

• It is divided into two components: PMAY-Urban for urban areas and PMAY-Gramin for rural areas.

• The initiative aims to provide affordable housing to all eligible beneficiaries, ensuring access to basic amenities like water, sanitation, and electricity.

• Deprivation Criteria:

• Under PMAY-G, SECC data identifies beneficiaries based on deprivation indicators such as households without housing or living in kutcha houses.

• These criteria ensure that the scheme targets the most vulnerable and needy sections of society.

• Implementation Process:

• PMAY-G is implemented in partnership with state governments and local bodies to ensure timely completion of projects.

• Funds are transferred directly to the beneficiaries' accounts through Direct Benefit Transfer (DBT).

• Beneficiaries are encouraged to participate in the construction process to reduce costs and ensure quality.

Q70. Answer: (c) Ajanta

The correct answer is Ajanta.

Key Points

• 'The Flying Apsara' is a famous painting located in the Ajanta Caves, a UNESCO World Heritage Site in Maharashtra, India.

• Ajanta Caves are renowned for their exquisite Buddhist rock-cut architecture and paintings depicting Jataka tales and the life of Buddha.

• 'The Flying Apsara' painting showcases the elegance and intricate artistry of ancient Indian painters, emphasizing movement and grace.

• The Ajanta frescoes are painted using the tempera technique, combining natural pigments and plant-based adhesives to create enduring artworks.

• The caves date back to 2nd century BCE to 6th century CE, representing one of the finest examples of Indian classical art traditions.

Additional Information

• Ajanta Caves:

• The Ajanta Caves consist of 30 caves, including monasteries and prayer halls, carved into the rock face of a horseshoe-shaped cliff.

• The caves are primarily dedicated to Buddhism and were used by monks for meditation and teaching.

• They are an important cultural and historical site, preserving ancient Indian art, architecture, and religious practices.

• Artistic Techniques:

• The tempera technique used in Ajanta paintings involves mixing pigments with a binding agent such as gum or egg yolk.

• The artists employed natural light in the caves, which filtered through openings, to work on the intricate details.

• The paintings depict themes like Buddhist myths, deities, and daily life activities, showcasing the harmony between religion and art.

• Apsaras in Indian Art:

• Apsaras are celestial maidens or dancers in Indian mythology, often associated with grace, beauty, and divine energy.

• 'The Flying Apsara' painting symbolizes the dynamic movement and ethereal presence of these celestial beings.

• UNESCO World Heritage Status:

• The Ajanta Caves were designated as a UNESCO World Heritage Site in 1983.

• They are recognized for their historical importance and artistic achievement, drawing visitors and scholars from around the world.

Q71. Answer: (a) Rs. 3,404

Shortcut Trick

Use the direct relation between Cost Price (CP) and Marked Price (MP): CP / MP = (100 − Discount%) / (100 + Profit%).

CP / 5,180 = (100 − 31) / (100 + 5) => CP / 5,180 = 69 / 105.

CP = (69 / 105) × 5,180.

CP = (23 / 35) × 5,180 => CP = 23 × 148.

CP = 3,404.

Therefore The correct answer is Rs. 3,404.

Alternate Method

Given → Marked Price (MP) = Rs. 5,180, Discount = 31%, Gain = 5%.

Formulas: SP = MP × (100 − D%) / 100 | CP = SP × 100 / (100 + P%).

=> Calculate Selling Price (SP): SP = 5,180 × (100 − 31) / 100.

=> SP = 5,180 × 0.69 = 3,574.2.

=> Calculate Cost Price (CP): CP = 3,574.2 × 100 / (100 + 5).

=> CP = 3,574.2 ÷ 1.05 = 3,404.

Therefore The correct answer is Rs. 3,404.

Additional Information

Marked Price and Discount

Discount is always calculated on the Marked Price (MP). SP = MP − Discount.

Profit and CP Relationship

Profit is always calculated on the Cost Price (CP). SP = CP + Profit.

Q72. Answer: (b) 1

Given: A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6.

1) B lives on a floor that is a prime number.

2) The product of floors on which B and D live is 3.

Floor	Person
6	
5	
4	
3	B/D
2	
1	B/D

3) Only 2 people live above C.

Floor	Person
6	
5	
4	C
3	B/D
2	
1	B/D

4) F lives immediately below A.

After positioning F and A only one position is left which will be occupied by the only person left i.e. E.

Floor	Person
6	A
5	F
4	C
3	B/D
2	E
1	B/D

Thus, one person live between A and C.

Hence, "Option 2" is the correct answer.

Q73. Answer: (b) 32 km/hr

Shortcut Trick

Speed of swimmer in still water = (Downstream Speed + Upstream Speed) ÷ 2

Speed = (37 + 27) ÷ 2

Speed = 64 ÷ 2 = 32 km/hr

Therefore The correct answer is 32 km/hr.

Alternate Method

Given:

Downstream Speed (u + v) = 37 km/hr

Upstream Speed (u − v) = 27 km/hr

Where u is the speed of the swimmer and v is the speed of the stream.

Adding the two equations:

=> (u + v) + (u − v) = 37 + 27

=> 2u = 64

=> u = 64 ÷ 2

=> u = 32 km/hr

Therefore The correct answer is 32 km/hr.

Additional Information

Speed of Stream

The speed of the current or stream (v) is calculated as: v = (Downstream Speed − Upstream Speed) ÷ 2.

Relative Speed in Water

Downstream speed is always greater than upstream speed because the stream's velocity adds to the swimmer's effort.

Q74. Answer: (b) 128 W 32 Z 120 Y 64 X 16

Decoding signs:

Sign	W	X	Y	Z
Stands For	÷	×	•	–

Required resultant: 908

So, checking each option one by one:

Option 1) 128 X 32 Y 120 Z 64 W 16 => 128 × 32 + 120 - 64 ÷ 16

=> 128 × 32 + 120 - 64 ÷ 16

=> 128 × 32 + 120 - 4

=> 4096 + 120 - 4

=> 4216 - 4

=> 4212

Option 2) 128 W 32 Z 120 Y 64 X 16 => 128 ÷ 32 - 120 + 64 × 16

=> 128 ÷ 32 - 120 + 64 × 16

=> 4 - 120 + 64 × 16

=> 4 + 1024 - 120

=> 1028 - 120

=> 908

Option 3) 128 Z 32 X 120 Y 64 Z 16 => 128 - 32 × 120 + 64 - 16

=> 128 - 32 × 120 + 64 - 16

=> 128 + 64 - 3840 - 16

=> 192 - 3840 - 16

=> -3664

Option 4) 128 Y 32 Z 120 X 64 W 16 => 128 + 32 - 120 × 64 ÷ 16

=> 128 + 32 - 120 × 64 ÷ 16

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=> 128 + 32 - 120 × 4

=> 128 + 32 - 480

=> 160 - 480

=> -320

Hence, "Option 2" is the correct answer.

Q75. Answer: (a) 34 : 51

Shortcut Trick

To find the greatest ratio, convert each to a decimal or compare against a benchmark like 0.5.

34 : 51 = 2/3 ≈ 0.66

All other ratios (38 : 77, 27 : 76, 31 : 72) are clearly less than 0.5 since the numerator is less than half of the denominator.

Therefore The correct answer is 34 : 51.

Alternate Method

Given: Ratios (1) 34:51, (2) 38:77, (3) 27:76, (4) 31:72.

=> Ratio 1 = 34 ÷ 51 = 2/3 = 0.666...

=> Ratio 2 = 38 ÷ 77 ≈ 0.493

=> Ratio 3 = 27 ÷ 76 ≈ 0.355

=> Ratio 4 = 31 ÷ 72 ≈ 0.430

=> Comparing all values: 0.666 > 0.493 > 0.430 > 0.355

Therefore The correct answer is 34 : 51.

Additional Information

Comparing Ratios

To compare ratios a:b and c:d, convert them to fractions a/b and c/d. Use cross-multiplication: if a×d > b×c, then a c/d.

Simplification Rule

Always check if a ratio can be simplified first. 34:51 can be simplified by dividing both terms by 17, resulting in 2:3.

Percentage Method

Multiply each ratio by 100 to compare as percentages. For example, 2/3 × 100 = 66.66%, while 38/77 × 100 ≈ 49.3%.

Q76. Answer: (a) 79

Given:

The expression to evaluate is: 57 + [5 + { 72 - (24 ÷ 6)} ÷ 4]

Calculation:

57 + [5 + { 72 - (24 ÷ 6)} ÷ 4]

=> 57 + [5 + { 72 - 4 } ÷ 4]

=> 57 + [5 + 68 ÷ 4]

=> 57 + [5 + 17]

=> 57 + 22

=> 79

Therefore The correct answer is option (1).

Q77. Answer: (b) Victoria Falls, Zimbabwe

The correct answer is Victoria Falls, Zimbabwe.

Key Points

• The 2024 Regional World Children's Day was commemorated by UNICEF at Victoria Falls, Zimbabwe, from 15 to 17 November.

• This event aimed to advocate for the rights and well-being of children globally, emphasizing the importance of child welfare and education.

• Victoria Falls, a UNESCO World Heritage Site, was chosen due to its global significance and the symbolic representation of cross-border collaboration.

• The event included discussions, workshops, and initiatives focused on addressing challenges faced by children, particularly in Africa and other developing regions.

• It brought together policymakers, activists, and children to emphasize the theme of equal opportunities and sustainable futures for all children.

Additional Information

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• UNICEF's World Children's Day:

• World Children's Day, celebrated annually on November 20, is an initiative by UNICEF to promote awareness and action on child rights globally.

• The day marks the adoption of the Declaration of the Rights of the Child (1959) and the Convention on the Rights of the Child (1989).

• The focus is on ensuring access to education, healthcare, and equal opportunities for children worldwide.

• Victoria Falls:

• Located on the Zambezi River at the border of Zambia and Zimbabwe, Victoria Falls is one of the world's largest waterfalls.

• It is a UNESCO World Heritage Site and a major tourist attraction due to its breathtaking beauty and ecological significance.

• Key Challenges for Children in Africa:

• High rates of poverty, malnutrition, and lack of access to quality education and healthcare.

• Child labor, early marriages, and conflicts remain significant barriers to child development in the region.

• UNICEF's Role:

• UNICEF works to provide humanitarian aid, advocate for child rights, and implement programs focusing on health, nutrition, and education.

• The organization collaborates with governments, NGOs, and communities to create sustainable impacts for children worldwide.

Q78. Answer: (c) JG 26

The logic followed here is:

DG 24 is related to WT 20

And,

IL 18 is related to BY 14

Similarly,

QT 30 is related to

Hence, "Option 3" is the correct answer.

Q79. Answer: (d) Narayana Guru

The correct answer is option 4.

Key Points

• The slogan “One God, One Caste” is indeed attributed to Shree Narayana Guru (1855–1928), the prominent social reformer from Kerala.

• Shree Narayana Guru worked to eradicate caste discrimination and promote social equality in Kerala.

• His teachings emphasized:

• Spiritual unity: All humans are equal before God.

• Social reform: Breaking down caste barriers and promoting education and self-respect.

• This slogan became a symbol of his reform movement, inspiring efforts against untouchability and social segregation.

Q80. Answer: (a) On the recommendation of the Prime Minister

The correct answer is On the recommendation of the Prime Minister.

Key Points

• The President of India has the authority to dissolve the Lok Sabha before its normal term expires, but this action must be taken on the advice of the Prime Minister and the Council of Ministers.

• This power is derived from Article 85(2)(b) of the Indian Constitution, which allows the President to dissolve the Lok Sabha based on the advice of the government.

• The dissolution of the Lok Sabha is usually recommended when the ruling party or coalition loses its majority in the House or during a political deadlock.

• The dissolution marks the end of the Lok Sabha's tenure, and fresh elections are conducted to reconstitute the House.

• The President does not have discretionary power to dissolve the Lok Sabha unless advised by the Prime Minister as per the principle of a parliamentary democracy.

Additional Information

• Article 85 of the Indian Constitution

• Article 85 empowers the President to summon and prorogue either House of Parliament and dissolve the Lok Sabha.

• Clause (2)(b) of Article 85 specifically mentions the President's power to dissolve the Lok Sabha on the advice of the Prime

Minister.

• Dissolution vs. Prorogation

• Dissolution: Ends the life of the Lok Sabha, necessitating general elections.

• Prorogation: Suspends the session of Parliament without dissolving it; the same members can return for the next session.

• Role of the Prime Minister

• The Prime Minister, as the head of the Council of Ministers, advises the President on matters such as dissolution of the Lok Sabha.

• This advice is binding on the President as per the principle of collective responsibility under Article 74.

• Parliamentary System of Governance

• India follows a parliamentary system where the executive is accountable to the legislature, making the Prime Minister's advice crucial in such decisions.

• The President acts as a constitutional head, exercising powers based on the advice of the Council of Ministers.

• Fresh Elections

• When the Lok Sabha is dissolved, the Election Commission of India conducts general elections to elect new members for the House.

• The dissolution ensures that the democratic process is refreshed periodically or in case of political impasses.

Q81. Answer: (c) 75

Shortcut Trick

Assume a base mean of 80 and calculate deviations from it.

Deviations: (+3), (−63), (−18), (+7), (−18), (+16), (+6), (+12), (+10).

Sum of deviations = 3 − 63 − 18 + 7 − 18 + 16 + 6 + 12 + 10 = −45.

Net change in mean = −45 ÷ 9 = −5.

Actual Arithmetic Mean = 80 − 5 = 75.

Therefore The correct answer is 75.

Alternate Method

Given observations: 83, 17, 62, 87, 62, 96, 86, 92, 90

Formula Used: Arithmetic Mean = (Sum of all observations) ÷ (Total number of observations)

Step-by-step Calculation:

=> Total number of observations (n) = 9

=> Sum of observations = 83 + 17 + 62 + 87 + 62 + 96 + 86 + 92 + 90

=> Sum of observations = 675

=> Arithmetic Mean = 675 ÷ 9

=> Arithmetic Mean = 75

Therefore The correct answer is 75.

Additional Information

Median of Data

To find the Median, arrange data in ascending order: 17, 62, 62, 83, 86, 87, 90, 92, 96. The middle term (5^(th) position) is 86.

Mode of Data

The Mode is the value that appears most frequently. In this set, 62 appears twice, so the Mode is 62.

Range

The Range is the difference between the maximum and minimum values: 96 − 17 = 79.

Q82. Answer: (a) 40

Shortcut Trick

Simplify ratio 5/14 : 16/13 : 20/14 → 5/14 : 16/13 : 10/7.

Multiply by LCM(14, 13) = 182 → 65 : 224 : 260.

Difference between Largest (260) and Smallest (65) → 195 units = 30.

Largest number → (30 ÷ 195) × 260 = (2/13) × 260 = 40.

Therefore The correct answer is 40.

Alternate Method

Given: Ratio = 5/14 : 16/13 : 20/14 and Difference = 30.

Calculations:

=> Simplified Ratio = 5/14 : 16/13 : 10/7

=> Multiply by 182: (5/14 × 182) : (16/13 × 182) : (10/7 × 182)

=> New Ratio = 65 : 224 : 260

=> Let numbers be 65k, 224k, and 260k.

=> Largest − Smallest = 260k − 65k = 195k

=> 195k = 30

=> k = 30/195 = 2/13

=> Largest number = 260 × (2/13) = 20 × 2 = 40

Therefore The correct answer is 40.

Additional Information

Ratio Simplification

To convert a fractional ratio a/b : c/d into integers, multiply all terms by the LCM of denominators b and d.

Comparison of Ratios

Once fractions are converted to a common denominator or integers, the largest numerator represents the largest number in the group.

Q83. Answer: (b) 11

Shortcut Trick

The x-coordinate of the centroid is the average of the x-coordinates of the vertices.

Sum of x-coordinates = 3 × Centroid x-coordinate

=> 0 + (−2) + p = 3 × 3

=> p − 2 = 9

=> p = 11

Therefore The correct answer is 11.

Alternate Method

Given: Vertices of the triangle are A(0, 4), B(−2, 0), and C(p, 2). The centroid G is (3, 2).

Formula Used: The coordinates of the centroid G(x, y) of a triangle with vertices (x1, y1), (x2, y2), and (x3, y3) are given by:

x = (x1 + x2 + x3) ÷ 3

y = (y1 + y2 + y3) ÷ 3

Calculations:

For the x-coordinate:

=> 3 = (0 + (−2) + p) ÷ 3

=> 3 × 3 = −2 + p

=> 9 = p − 2

=> p = 9 + 2

=> p = 11

For the y-coordinate (Verification):

=> 2 = (4 + 0 + 2) ÷ 3

=> 2 = 6 ÷ 3

=> 2 = 2 (LHS = RHS)

Therefore The correct answer is 11.

Additional Information

Centroid Definition

The centroid is the point of intersection of the three medians of a triangle (lines joining vertices to the midpoints of opposite sides).

Centroid Ratio Property

The centroid divides each median in the ratio 2 : 1, with the larger part being closer to the vertex.

Area of Triangle (Coordinates)

Area = 1/2 |x1(y2 − y3) + x2(y3 − y1) + x3(y1 − y2)|. This formula helps find the area using vertex coordinates.

Q84. Answer: (d) GNJ

The logic followed here is:

Option 1) MTO

Option 2) JQL
Option 3) PWR
Option 4) GNJ
Thus, out of all the options, 'GNJ' is the odd one out.
Hence, "Option 4" is the correct answer.

Q85. Answer: (d) OU49

The logic followed here is:
Hence, "Option 4" is the correct answer.

Q86. Answer: (b) 2

Given number: 8132574
According to the question,

Number given	8	1	3	2	5	7	4
Odd digit → (+1) Even digit → (-2)	(-2)	(+1)	(+1)	(-2)	(+1)	(+1)	(-2)
Resultant number	6	2	4	0	6	8	2

So, the number of digits that appeared more than once in the new number thus formed → 6 and 2 = Two
Hence, "Option 2" is the correct answer.

Q87. Answer: (d) 12

Shortcut Trick
Speed ratio = 2 : 7 (New : Normal)
Since distance is constant, Time ratio = 7 : 2 (New : Normal)
Difference in time units = 7 − 2 = 5 units
5 units = 30 minutes => 1 unit = 6 minutes
Normal time = 2 units = 2 × 6 = 12 minutes
Therefore The correct answer is 12 minutes.
Alternate Method
Given: New speed = 2/7 of Normal speed, Time delay = 30 minutes.
Formula Used: Distance = Speed × Time; If Speed ratio is a : b, then Time ratio is b : a for a fixed distance.
=> Let normal speed be S and normal time be T.
=> New speed = (2/7)S
=> New time = T + 30
=> S × T = (2/7)S × (T + 30)
=> T = (2/7) × (T + 30)
=> 7T = 2T + 60
=> 5T = 60
=> T = 12 minutes
Therefore The correct answer is 12 minutes.
Additional Information
Inverse Proportion of Speed and Time
When the distance traveled is constant, the speed is inversely proportional to the time taken (S prop. to 1/T).
Average Speed
If a person travels two equal distances at speeds x and y, the average speed is given by 2xy/(x + y).
Relative Speed
For two objects moving in the same direction, relative speed = S1 − S2. For opposite directions, relative speed = S1 + S2.

Q88. Answer: (d) N $ 2 % N

Given Table:

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Letter	U	M	S	J	P	T	F	E	A
Code	7	4	@	$	%	•	6	2	3

According to the given condition:

Rule no.	Condition	Result
I	1st letter is a vowel and the 3rd letter is a consonant	Both to be coded as the code of the consonant
II	1st and last letters are vowels	Both are to be coded as 'N'
III	2nd and last letters are vowels	Codes are to be interchanged

Given: UJEPA

Here, II rule applies i.e. 1st and last letters are vowels

U → coded as N

J → coded as $

E → coded as 2

P → coded as %

A → coded as N

So, UJEPA → Coded as N $ 2 % N

Hence, "Option 4" is the correct answer.

Q89. Answer: (d) 0.01°C

The correct answer is 0.01ºC.

Key Points

• The triple point of water is the temperature and pressure at which water exists simultaneously in its solid, liquid, and gaseous states.

• On the Celsius scale, the triple point of water is precisely 0.01ºC.

• This value is used as a standard fixed point in the definition of the Celsius temperature scale.

• The corresponding pressure at the triple point of water is exactly 611.657 pascals (Pa).

• The triple point of water is critical for scientific calibration of thermometers and maintaining the International Temperature Scale.

Additional Information

• Definition of Triple Point:

• The triple point is a unique thermodynamic state where three phases (solid, liquid, and gas) coexist in equilibrium.

• It is a fundamental reference point for thermodynamic measurements.

• Kelvin and Celsius Relationship:

• The triple point of water is defined as 273.16 K on the Kelvin scale.

• The Celsius scale is defined such that the triple point of water is 0.01ºC.

• Role in Metrology:

• The triple point of water is used in metrology to calibrate temperature-measuring instruments.

• It is a key reference point for defining the International Temperature Scale (ITS-90).

• Physical Significance:

• The triple point demonstrates the delicate balance of thermodynamic states under specific conditions.

• For water, it highlights the unique properties of this universal solvent, which is critical for life on Earth.

Q90. Answer: (c) Steatite

The correct answer is Steatite.

Key Points

• Harappan seals were primarily made of steatite, a soft stone that was easy to carve and shape.

• Steatite seals were often heated to harden them, which also gave them a glazed finish.

• The seals typically featured inscriptions in the Harappan script along with depictions of animals, humans, or religious symbols.

• These seals were used for trade and administrative purposes, serving as markers of ownership or identity.

• Thousands of such seals have been discovered at major Harappan sites like Mohenjo-Daro and Harappa, providing valuable insights into the civilization.

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Additional Information

• Steatite: Also known as soapstone, steatite is a type of metamorphic rock composed mainly of talc. It is soft and can be easily carved, making it ideal for creating intricate designs.

• Harappan Script: The writing on Harappan seals remains undeciphered to this day. It consists of pictorial symbols and is believed to represent an ancient form of writing.

• Animal Motifs: Common animals depicted on seals include bulls, unicorns, elephants, and rhinoceroses. These may have had symbolic or religious significance.

• Usage of Seals: Apart from trade, the seals might have been used to stamp clay on goods or letters, serving as a form of identity verification or branding.

• Archaeological Importance: Harappan seals provide critical evidence of the technological, artistic, and social aspects of the Indus Valley Civilization, one of the world's oldest urban cultures.

Q91. Answer: (a) 2

Given series: (Left) 2 @ % * 2 7 4 8 € @ % © $ 7 6 6 * $ 7 £ 7 6 (Right)

According to the question,

Required condition: Number - Number - Symbol

(Left) 2 @ % * 2 7 4 8 € @ % © $ 7 6 6 * $ 7 £ 7 6 (Right)

Thus, there are two such number which are immediately preceded by a number and also immediately followed by a symbol.

Hence, "Option 1" is the correct answer.

Q92. Answer: (b) Saves the current document

The correct answer is Saves the current document.

Key Points

• Pressing Ctrl + S in most computer applications is the universal shortcut for saving the current document or file.

• This shortcut command is commonly used in software like Microsoft Word, Excel, PowerPoint, and other text or file editors.

• It ensures that any changes made to the document are stored in the permanent memory (like the hard drive) to avoid data loss.

• If the document has not been saved previously, the system will prompt the user to choose a file name and location for saving.

• Regularly saving your work using Ctrl + S is a good practice to prevent loss of data due to unexpected crashes or errors.

Additional Information

• Keyboard Shortcuts:

• Keyboard shortcuts are combinations of keys that provide quick access to common functions in applications.

• For example, Ctrl + C is used to copy, Ctrl + V to paste, and Ctrl + Z to undo the last action.

• These shortcuts help improve productivity and reduce reliance on mouse clicks.

• Save vs Save As:

• The Save command updates the current file with any changes made, while Save As allows saving the file under a new name or in a different location.

• Save As is particularly useful when creating multiple versions of a document.

• AutoSave Feature:

• Many modern applications include an AutoSave feature that periodically saves the document in the background.

• This feature minimizes data loss in case of system crashes or power outages.

• For example, Microsoft Office applications have AutoSave enabled for files stored in OneDrive or SharePoint.

• File Formats:

• When saving a document, users can choose from various file formats such as .docx, .pdf, .txt, or .xls, depending on the software.

• Each format serves a specific purpose—for instance, .pdf is often used for read-only sharing, while .docx is editable.

Q93. Answer: (d) Elephanta caves

The correct answer is Elephanta caves.

Key Points

• The 'Trimurti' sculpture is located in the Elephanta Caves, a UNESCO World Heritage Site near Mumbai, Maharashtra.

• The sculpture depicts the three faces of Lord Shiva, representing his roles as the Creator (Brahma), Preserver (Vishnu), and Destroyer (Mahesh).

• This colossal statue is carved in relief, measuring approximately 20 feet in height, and is considered one of the finest examples of ancient Indian rock-cut art.

• The Elephanta Caves date back to the 5th–7th century CE, and the Trimurti is the central figure of the main cave, known as the

Great Cave or Cave 1.

• The caves are attributed to the Shaivite faith and reflect the rich cultural and religious heritage of India.

Additional Information

• Elephanta Caves:

• Located on Elephanta Island (Gharapuri Island) in Mumbai Harbour, about 10 km from the Gateway of India.

• These caves are divided into two groups: Hindu caves (dedicated to Lord Shiva) and Buddhist caves.

• The island was named "Elephanta" by Portuguese explorers after they found a large stone elephant statue there.

• Significance of Trimurti:

• The Trimurti embodies the concept of the cosmic functions of creation, preservation, and destruction in Hinduism.

• The three heads symbolize Satvik (purity), Rajasik (passion), and Tamasik (destruction) aspects of existence.

• Artistic Style:

• The caves are an excellent example of Gupta-era architecture, showcasing intricate carvings and iconography.

• The Trimurti relief is considered a masterpiece of Indian art and is an iconic representation of rock-cut sculpture.

• UNESCO Recognition:

• The Elephanta Caves were designated as a UNESCO World Heritage Site in 1987 for their outstanding universal value.

• They are preserved as an important cultural heritage of India.

Q94. Answer: (b) 1

Given series: (Left) £ % * 3 6 £ 1 © & 8 1 5 5 3 * # © 7 1 7 3 @ (Right)

According to the question,

Required condition: Number - Symbol - Number

(Left) £ % * 3 6 £ 1 © & 8 1 5 5 3 * # © 7 1 7 3 @ (Right)

Thus, there is one such symbols which is immediately preceded by a symbol and also immediately followed by a number.

Hence, "Option 2" is the correct answer.

Q95. Answer: (b) Rs. 159

Given:

The cost of 15 pens and 6 pencils is Rs. 291.

If the cost of a pen decreases by Rs. 9 and the cost of a pencil increases by Rs. 2, then the cost of 9 pens and 3 pencils is Rs. 75.

To find the original cost of 12 pens and 3 pencils.

Formula used:

Let the cost of a pen = Rs. x and the cost of a pencil = Rs. y.

Calculations:

From the given, we use the equations:

1) 15x + 6y = 291

2) 9(x - 9) + 3(y + 2) = 75

=> 9x - 81 + 3y + 6 = 75

=> 9x + 3y = 150

=> 3(3x + y) = 150

=> 3x + y = 50 ...(3)

From equation (1):

15x + 6y = 291

=> 3(5x + 2y) = 291

=> 5x + 2y = 97 ...(4)

Solving equations (3) and (4):

From (3): y = 50 - 3x

Substitute y = 50 - 3x into (4):

5x + 2(50 - 3x) = 97

=> 5x + 100 - 6x = 97

=> -x + 100 = 97

=> x = 3

Substitute x = 3 into (3):

3(3) + y = 50

=> 9 + y = 50

=> y = 41

Now, the cost of 12 pens and 3 pencils:

12x + 3y = 12(3) + 3(41)

=> 36 + 123 = 159

Therefore The correct answer is option (2): Rs. 159.

Q96. Answer: (c) 37

Shortcut Trick

Since the Mode (165) is the boundary between the classes 160−165 and 165−170, the frequencies of these two classes must be balanced.

Using the Mode formula: Mode = l + [(f1 − f0) ÷ (2f1 − f0 − f2)] × h

Substituting values: 165 = 160 + [(37 − 25) ÷ (74 − 25 − x)] × 5

5 = [12 ÷ (49 − x)] × 5 => 1 = 12 ÷ (49 − x) => 49 − x = 12 => x = 37.

Therefore The correct answer is 37.

Alternate Method

Given:

Mode = 165

Modal Class = 160−165 (Lower limit l = 160)

Frequency of modal class (f1) = 37

Frequency of preceding class (f0) = 25

Frequency of succeeding class (f2) = x

Class width (h) = 5

Formula Used:

Mode = l + [(f1 − f0) ÷ (2f1 − f0 − f2)] × h

23

25

37

x

28

Q97. Answer: (d) Aparna Sen

The correct answer is Aparna Sen.

Key Points

• Aparna Sen, a renowned Indian filmmaker, received the Satyajit Ray Lifetime Achievement Award in January 2025.

• The award honors her exceptional contributions to Indian cinema as a director, screenwriter, and actress.

• She is known for her critically acclaimed films, such as "36 Chowringhee Lane" (1981), which received a National Film Award.

• Aparna Sen has been a significant figure in parallel cinema, focusing on social issues and human relationships in her works.

• The Satyajit Ray Lifetime Achievement Award is one of the most prestigious honors in Indian cinema, named after the legendary filmmaker Satyajit Ray.

Additional Information

• Satyajit Ray

• Satyajit Ray was a renowned Indian filmmaker known for his contributions to world cinema.

• His famous works include the Apu Trilogy, "Charulata," and "Pather Panchali."

• He received an Honorary Academy Award in 1992 for his lifetime achievements.

• Ray's films often explored human emotions, social realities, and cultural nuances.

• Aparna Sen's Career

• Aparna Sen started her career as an actress before transitioning to filmmaking.

• She has directed notable films like "Mr. and Mrs. Iyer" (2002) and "The Japanese Wife" (2010).

• She has received multiple National Film Awards for her contributions to Indian cinema.

• Her works often highlight women-centric narratives and societal challenges.

• Satyajit Ray Lifetime Achievement Award

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• The award is given annually to filmmakers who have made significant contributions to cinema.
• It is presented at the International Film Festival of India (IFFI), held in Goa.
• Past recipients include filmmakers such as Martin Scorsese and István Szabó.
• This award celebrates the legacy of Satyajit Ray, a pioneer of Indian cinema.
• Parallel Cinema in India
• Parallel cinema, also known as art cinema, focuses on realistic and socially conscious themes.
• Filmmakers like Aparna Sen, Satyajit Ray, and Shyam Benegal have contributed significantly to this movement.
• It emerged as an alternative to mainstream Bollywood cinema in the 1950s.
• Parallel cinema often highlights critical social issues, human relationships, and cultural narratives.

Q98. Answer: (a) 89.76 m²

Shortcut Trick

When a rectangular paper is rolled into a cylinder, its Curved Surface Area (CSA) is exactly equal to the Area of the Rectangle.

Area of Rectangle = Length × Breadth

Area = 12 m × 7.48 m = 89.76 m²

Therefore The correct answer is 89.76 m².

Alternate Method

Given:

Length of rectangular paper (L) = 12 m

Breadth of rectangular paper (B) = 7.48 m

The paper is rolled along its breadth to form a cylinder.

Formula Used:

Curved Surface Area (CSA) of cylinder = 2 × π × r × h

When rolled along the breadth:

=> Height (h) of cylinder = Length of rectangle = 12 m

=> Circumference (2πr) of base = Breadth of rectangle = 7.48 m

Calculations:

=> CSA = (2πr) × h

=> CSA = 7.48 × 12

=> CSA = 89.76 m²

Therefore The correct answer is 89.76 m².

Additional Information

Rolling along Length vs Breadth

If rolled along Length, h = Breadth and 2πr = Length. If rolled along Breadth, h = Length and 2πr = Breadth. In both cases, CSA remains the Area of the paper.

Total Surface Area of Cylinder

TSA = 2πr(h + r). This includes the CSA plus the areas of the two circular bases (2 × πr²).

Volume of Cylinder

Volume = πr²h. It measures the total capacity or space occupied by the 3D cylinder.

Q99. Answer: (d) 64

Given: Shubham ranked 19th from the top and 46th from the bottom in his class.

Shubham's rank from the top = 19

Shubham's rank from the bottom = 46

Total students = Shubham's rank from the top + Shubham's rank from the bottom - 1

= 19 + 46 - 1 → 64

Hence, "Option 4" is the correct answer.

Q100. Answer: (b) BCZP

Given Table:

Number/symbol	@	4	6	9	$	•	3	%	#	7	&	5	$	2

Code	L	V	C	M	K	P	B	Q	Z	Y	R	B	U	F

According to the given condition:

Rule no.	Condition	Result
I	First element is a symbol and the last an odd number	codes for these two are to be interchanged
II	First element is an odd number and the last an even number	First and last elements are to be coded as ©
III	Both second and third elements are perfect squares	Third element is to be coded as the code for the second element

Given: + 6 # 5

Here, I rule applies i.e. First element is a symbol and the last an odd number.

• → coded as B (Codes interchanged)

6 → coded as C

→ coded as Z

5 → coded as P (Codes interchanged)

So, + 6 # 5 → Coded as BCZP

Hence, "Option 2" is the correct answer.

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