RRB NTPC Graduate Level CBT-I Official Paper (Held On: 18 Jun, 2025 Shift 1) (Previous Year Paper)

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

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Q1. Which of the following is the easternmost international border point of India?

(a) Nathu La
(b) Lipulekh
(c) Rohtang
(d) Kibithu

Q2. If the median of a data is 71.24 less than its mode, then the median of the data exceeds its mean by _____. (Use the empirical formula)

(a) 41.97
(b) 35.62
(c) 34.14
(d) 33.91

Q3. Two banks, A and B, offered loans at 3.5% and 6.5% per annum, respectively. Keshav borrowed an amount of Rs. 2,00,000 from each bank. Find the positive difference between the amounts of simple interest paid to the two banks by Keshav after 2 years

(a) 13,000
(b) 11,500
(c) 13,500
(d) 12,000

Q4. Morarji Desai was commemorated on his 129th birth anniversary, 28 February 2025, for his contributions to governance reforms in India. Which of the following commissions did he chair in 1966 to restructure the country's governance?

(a) 1st Finance Commission
(b) 1st Administrative Reforms Commission
(c) Sarkaria Commission
(d) Planning Commission

Q5. The present cost of an apartment is Rs. 1,70,014. After a year, its cost increased to Rs. 1,93,900. The percentage increase (rounded off to the nearest integer) in the cost of the apartment is:

(a) 28%
(b) 22%
(c) 14%
(d) 3%

Q6. What should come in place of the question mark (?) in the given series?

7 9 13 21 37 ?

(a) 71
(b) 66
(c) 69
(d) 65

Q7. If the selling price of a bed is 2-times of initial, then the profit is 6-times of initial. Find the initial profit percentage (in %).

(a) 33.33
(b) 25
(c) 300
(d) 200

Q8. Find the smallest number by which 6760 must be multiplied to make it a perfect square.

(a) 28
(b) 26
(c) 10
(d) 23

Q9. Which Fundamental Right was subjected to additional restrictions by the First Amendment Act of 1951?

(a) Right to Constitutional Remedies
(b) Right to Freedom of Religion
(c) Right to Freedom of Speech and Expression
(d) Right to Equality

Q10. Gyanesh starts from Point Y and drives 11 km towards the south. He then takes a left turn, drives 45 km, turns right and drives 29 km. He then takes a right turn and drives 18 km. He takes a right turn, drives 13 km. He then turns right, drives 29 km, turns left and drives 27 km to stop at Point Z. How far (shortest distance) and towards which direction should he drive in order to reach Point Y again? (All turns are 90-degree turns only unless specified.)

(a) 51 km towards the east
(b) 56 km towards the west
(c) 61 km towards the west
(d) 53 km towards the north

Q11. Which of the following ratios is greatest?

(a) 19 : 37
(b) 15 : 33
(c) 18 : 37
(d) 10 : 15

Q12. This question is based on the five, three-digit numbers given below.

(Left) 143 656 651 264 282 (Right)

(Example- 697 – First digit = 6, second digit = 9 and third digit = 7) (NOTE: All operations to be done from left to right.) What will be the resultant if the first digit of the highest number is subtracted from the third digit of the lowest number?

(a) −4
(b) −3
(c) −2
(d) 0

Q13. The diameter of a sphere is 2 cm more than the diameter of a smaller sphere. The surface area of the larger sphere is 528 cm^2 more than the surface area of the smaller sphere. What is the diameter (in cm) of the larger sphere?

Take $\pi = 22/7$

(a) 45
(b) 43
(c) 39
(d) 41

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Q14. After the revolt of which year did the British implement measures that reduced the proportion of Indian soldiers in the army and increased the number of European soldiers?

(a) 1874
(b) 1857
(c) 1841
(d) 1806

Q15. GCKH is related to EAIF in a certain way based on the English alphabetical order. In the same way, JFNK is related to HDLI. To which of the given options is MIQN related, following the same logic?

(a) GKLO
(b) KGOL
(c) GKOL
(d) KGLO

Q16. Seven boxes, A, B, C, D, E, F and G, are kept one over the other, but not necessarily in the same order. Only three boxes are kept above G. Only one box is kept between A and G. Only three boxes are kept between A and F. F is kept at some place above G. B is kept immediately below F. D is kept at one of the places above E. C is not kept immediately above or below A. How many boxes are kept above D?

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

Q17. Which uprising in Uttar Pradesh, led by Mufti Muhammad Aiwaz, was among the most significant revolts against British rule in India prior to the First War of Independence in 1857?

(a) Kol Uprisings
(b) Bareilly Uprisings
(c) Santhal Rebellion
(d) Chuar Rebellion

Q18. Chords AB and CD of a circle intersect externally at P. If AB = 7 cm, CD = 1 cm and PD = 5 cm, then the length of PB (in cm) is:

(a) 5
(b) 3
(c) 4
(d) 2

Q19. What natural feature existed between the Himalayas and the Deccan Plateau before the formation of the Great Plain?

(a) A deep ocean trench
(b) A mountain range
(c) A dense forest
(d) A shallow trough or geosyncline

Q20. Amita travels a certain distance at a speed of 84 km/hr and double the earlier distance at 28 km/hr. She then returns to the starting point through the same route. If her average speed for the entire journey is 24 km/hr, then what is her speed (in km/hr) for the return journey?

(a) 18
(b) 16
(c) 21.5
(d) 17.2

Q21. On 26 February 2025, the Centre for Science and Environment (CSE) and Down To Earth (DTE) magazine released their annual publication 'State of India's Environment' from which state?

(a) Kerala
(b) Gujarat

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(c) Rajasthan
(d) West Bengal

Q22. How many poems are included in Behramji Merwanji Malabari's 'The Indian Muse in English Garb'?
(a) 25
(b) 32
(c) 40
(d) 20

Q23. What was India's external debt to GDP ratio at the end of September 2024?
(a) 34%
(b) 19.4%
(c) 13.4%
(d) 24.6%

Q24. The length of the diagonals of a rhombus are (y + xy + 5) m and (y − xy + 7) m respectively. Find the area of the rhombus, if x = 2 and y = 1.
(a) 21 m²
(b) 24 m²
(c) 18 m²
(d) 27 m²

Q25. Select the pair that follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.
KNR : HKS
TGK : QDL
(a) LOQ : FJU
(b) HMI : DKL
(c) GCP : EHR
(d) FXL : CUM

Q26. Overall, the Panchayati Raj system in India is designed to promote:
(a) economic austerity across the country for people's betterment
(b) central control over local areas across the country
(c) democratic governance and empowerment at the grassroots level
(d) international funding for local projects, ensuring adequate development

Q27. With reference to computing, what does ASCII stand for?
(a) Algorithmic Standard Code for International Information
(b) American Standard Code for Information Integrity
(c) American Standard Code for Information Interchange
(d) American Systematic Code for International Interoperability

Q28. The President's power to seek the Supreme Court's opinion on questions of law comes under _____.
(a) Article 131
(b) Article 136
(c) Article 226
(d) Article 143

Q29. If + means −, − means ×, × means ÷, ÷ means +, then what will come in place of the question mark (?) in the following equation?
96 × 6 − 8 ÷ 71 + 26 = ?
(a) 186
(b) 173
(c) 181

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(d) 194

Q30. The ratio of three numbers is 5 : 16 : 21. If 20 percent of the first number is 26, what would be 40 percent of the difference of the third and second number?

(a) 51
(b) 54
(c) 50
(d) 52

Q31. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

PIL NGJ LEH JCF ?

(a) HBD
(b) HAE
(c) HAD
(d) HBE

Q32. What is the primary objective of 'Srjanam', the biomedical waste conversion system launched in 2025?

(a) To develop a new method for incineration
(b) To promote traditional biomedical waste disposal methods
(c) To increase the use of landfills for biomedical waste
(d) To reduce environmental hazards by eliminating incineration

Q33. The equivalent fraction of 6.555... is:

(a) 56/13
(b) 59/9
(c) 53/17
(d) 61/3

Q34. Which of the following accurately describes the Indian President's role in foreign affairs?

(a) The President delegates all foreign affairs responsibilities to the Prime Minister.
(b) The President appoints ambassadors and conducts diplomatic work in his/her name.
(c) The President only receives foreign ambassadors but does not appoint them
(d) The President is solely responsible for negotiating international treaties without any advisory input.

Q35. Which of the following correctly characterises the regulatory and structural aspects of the NPS Vatsalya scheme, as launched in 2024?

1. The scheme is administered by the Pension Fund Regulatory and Development Authority (PFRDA).

2. Contributions under NPS Vatsalya are pooled into a government-managed consolidated fund without individual accounts.

3.The scheme allows a smooth shift to a regular NPS account when the subscriber turns 18 years of age.

4.Upon attaining adulthood, subscribers must compulsorily exit NPS Vatsalya and opt for the Atal Pension Yojana.

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

Q36. A salesman marks his good 20% above the cost price and gives a discount of 25% on them. Find the percentage of this gain or loss.

(a) 12% loss
(b) 9% gain
(c) 10% loss
(d) 11% loss

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Q37. Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week. Only three people have exams after R. P has the exam immediately after R, but before Q. S has the exam before U but after V. T has the exam on Sunday. How many people have exams between P and S?

(a) One
(b) Three
(c) Four
(d) Two

Q38. Each of the digits in the number 6427519 is arranged in ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?

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

Q39. 5 times the present age of Sujatha is 5 years more than 2 times the present age of Vanita. After 4 years, 3 times the age of Vanita will be 8 years less than 5 times the age of Sujatha. The age of Vanita is k years more than that of Sujatha. What is the value of k?

(a) 2
(b) 4
(c) 3
(d) 5

Q40. If it is 12 noon at IST (82°30′E), what time is it approximately at 97°30′E longitude?

(a) 1:20 PM
(b) 12:30 PM
(c) 11:00 AM
(d) 1:00 PM

Q41. In the Indian context, population growth in Class I cities is the most influenced by _____.

(a) natural increase
(b) migration from rural areas
(c) religious factors
(d) government employment

Q42. In MS Excel 2019, what is the primary purpose of the 'Print Preview' feature?

(a) To edit data
(b) To view how the sheet will look when printed
(c) To zoom into the sheet
(d) To save the spreadsheet

Q43. The fourth proportion to 9, 3 and 27 is the same as the third proportion to A and 24. What is the value of A?

(a) 63
(b) 61
(c) 62
(d) 64

Q44. Following the provisions of the 73rd Constitutional Amendment 1992, how frequently are the members of the Gram Sabha expected to meet in a year?

(a) Every week
(b) At least twice in a year
(c) Once every five years
(d) Once a month

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Q45. Which British Viceroy described the Congress as representing only a 'microscopic minority' of the Indian population, thereby dismissing its political relevance?

(a) Lord Dufferin
(b) Lord Ripon
(c) Lord Lytton
(d) Lord Curzon

Q46. Mr. Evan starts from Point A and drives 8 km towards the East. He then takes a right turn, drives 19 km, turns right and drives 19 km. He then takes a right turn and drives 9 km. He then taken a right turn, drives 3 km, turns left and drives 6 km. He takes a final right turn, drives 8 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90 degrees turns only unless specified.)

(a) 3 km to the West
(b) 4 km to the North
(c) 9 km to the West
(d) 7 km to the North

Q47. What is the theme of the Venice Architecture Biennale scheduled to be held in May to November 2025?

(a) Intelligence: Natural. Artificial. Collective
(b) Sustainable Urban Futures
(c) Designing Future Societies
(d) Architecture and Climate Change

Q48. In a certain code language, ‘BOLT’ is coded as ‘4195’ and ‘TOLD’ is coded as ‘4529’. What is the code for ‘D’ in the given code language?

(a) 9
(b) 4
(c) 2
(d) 5

Q49. Which Pulitzer-winning investigative series was titled 'Fentanyl Express'?

(a) The New Yorker
(b) NBC News
(c) Reuters
(d) CNN

Q50. In January 2025, which of the following individuals was appointed as the Chairman of the Indian Space Research Organisation (ISRO)?

(a) G Madhavan Nair
(b) K Sivan
(c) V Narayanan
(d) Tapan Misra

Q51. 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) IKF
(b) GID
(c) KMG
(d) MOJ

Q52. Find the value of (cos 35°)/(sin 55°) + (sin 11°)/(cos 79°) - 2cos 27° cosec 63°.

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

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Q53. Desert soil is mostly found in which Indian state?

(a) Rajasthan
(b) Uttar Pradesh
(c) Kerala
(d) Tamil Nadu

Q54. Which of the following is the function of Ctrl + Shift + V in certain applications like Google Docs or web browsers?

(a) Pastes content without any formatting
(b) Saves the document as a new file
(c) Opens the Find and Replace dialog box
(d) Reverts to the previous page in the browser

Q55. In a certain code language, 'RACE' is coded as '6259' and 'ANTS' is coded as '7941'. What is the code for 'A' in the given code language?

(a) 7
(b) 9
(c) 2
(d) 1

Q56. Simplify [(22 × 6) × {8 ÷ 4 × (15 - 11/4)}]

(a) 3234
(b) 3262
(c) 3275
(d) 3277

Q57. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All chimpanzees are gorilla.

All gorillas are monkeys.

No monkey is a langur.

Conclusion:

(I) Some langurs are gorillas.

(II) Some monkeys are chimpanzees.

(a) Both Conclusions (I) and (II) follow
(b) Only Conclusion (II) follows
(c) Only Conclusion (I) follows
(d) Neither Conclusion (I) nor (II) follows

Q58. Lauren Roberts' novel, third in 'The Powerless' trilogy, is titled:

(a) Fearless
(b) Powerless
(c) Endless
(d) Reckless

Q59. Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number results in the second number. Similarly, certain mathematical operation(s) on the second number results in the third number and so on. Which of the given options follows the same set of operations as in the given 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.)

12 - 14 - 16 - 20

14 - 16 - 18 - 22

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(a) 3 - 5 - 7 - 11
(b) 19 - 20 - 22 - 44
(c) 4 - 8 - 16 - 32
(d) 13 - 15 - 17 - 32

Q60. In January 2025, which woman cricketer received the Polly Umrigar Award from the BCCI?
(a) Deepti Sharma
(b) Smriti Mandhana
(c) Shefali Verma
(d) Jemimah Rodrigues

Q61. What is the total budget allocation for infrastructure spending in India for 2023-24?
(a) Rs. 7 lakh crore
(b) Rs. 10 lakh crore
(c) Rs. 5 lakh crore
(d) Rs. 9 lakh crore

Q62. A and B can do a piece of work in 12 days and 18 days, respectively. Both work for 2 days and then A goes away and B completed the remaining work alone. The whole work was completed in _____ days.
(a) 16
(b) 15
(c) 14
(d) 13

Q63. The median of the observations 59, 67, 17, 38, 88, 61, 80, 91, 30, 48 and 80 is:
(a) 59
(b) 67
(c) 58
(d) 61

Q64. In a certain code language, 'A + B' means ‘A is the mother of B’ 'A – B' means ‘A is the brother of B’ 'A x B' means ‘A is the wife of B’ 'A ÷ B' means ‘A is the father of B’
Based on the above, how is P related to T if ‘P ÷ Q + R – S x T’?
(a) WIfe's mother's father
(b) Wife's sister's husband
(c) Son's daughter's husband
(d) Wife's father's mother

Q65. The speed limit on a highway has the dimension of:
(a) Time over length
(b) Mass
(c) Length over time
(d) Time

Q66. What percentage of the workforce in India was self-employed in 2023-24, reflecting a growing trend towards entrepreneurship, as per the Economic Survey Report, 2024-25?
(a) 62.8%
(b) 48.2%
(c) 58.4%
(d) 52.6%

Q67. Kalpana and Sudha got 696 and 584 marks, respectively, in the same examination. If Kalpana scored 87% marks, then what is the percentage of marks scored by Sudha?
(a) 73%
(b) 74%

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(c) 76%
(d) 72%

Q68. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only. (NOTE: All numbers are single digit numbers only.)

(Left) * # 8 # 5 # 3 3 € 6 7 & # 3 $ € @ 9 # 7 £ 9 (Right)

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

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

Q69. By the 1970s, Public Sector Units (PSUs) had become dominant in the Indian industry. What criticism did they frequently face?

(a) Excessive foreign ownership and capital outflow
(b) High competition from private multinational corporations
(c) Over-reliance on export markets for revenue
(d) Operational inefficiencies, low productivity, and financial losses

Q70. A, B, C, D, E, F, and G are sitting around a circular table facing the centre. Only C sits between A and E. E sits third to the left of D. B sits to the immediate left of D. G is not an immediate neighbour of E. How many people sit between C and G when counted from the right of C?

(a) One
(b) Four
(c) Three
(d) Two

Q71. Which category of musical instruments was related to objects of utility in daily life?

(a) Ghana Vadya
(b) Sushira Vadya
(c) Tata Vadya
(d) Avanaddh Vadya

Q72. Which of the following is the SI unit for sound intensity?

(a) Watt (W)
(b) Watt per square metre (W/ m^2)
(c) Pascal (Pa)
(d) Metre per second (m/s)

Q73. A, B, C, D, R, S and T are sitting around a circular table facing the centre of the table. Only three people sit between T and R when counted from the left of T. Only three people sit between A and S when counted from the right of S. C sits to the immediate right of A. B is an immediate neighbour of S as well as R. Who sits third to the right of D?

(a) A
(b) C
(c) S
(d) T

Q74. If α and β are the roots of the equation $x^2 - 6x - 5 = 0$, then find the equation having the roots 3α and 3β.

(a) $x^2 - 15x + 48 = 0$
(b) $x^2 - 18x - 48 = 0$
(c) $x^2 - 15x + 45 = 0$
(d) $x^2 - 18x - 45 = 0$

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Q75. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.

TPY URS VTM WVG ?

(a) XWA
(b) XXA
(c) XWZ
(d) XXB

Q76. Which of the following is the main purpose of using the 'Ctrl + S' keyboard shortcut while working on an MS PowerPoint presentation?

(a) To close the presentation window immediately
(b) To share the presentation via email
(c) To start a slideshow from the beginning
(d) To save the current changes made to the file

Q77. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 4275613, how many digits will appear more than once in the new number thus formed?

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

Q78. A train is 591 m and it crosses a platform in 1.7 minutes running at the speed of 36 km/hr. Find the difference between the length of the train and the platform.

(a) 171 m
(b) 170 m
(c) 159 m
(d) 162 m

Q79. In 2024, India became the world's top milk producer with a production of 239 million metric tons. Which government initiative significantly contributed to this achievement?

(a) Operation Milk
(b) White Revolution
(c) National Dairy Development Program
(d) Rashtriya Gokul Mission

Q80. Who among the following issued the earliest land grant of the Maitraka family in 502 CE?

(a) Guhasena
(b) Dronasimha
(c) Shiladitya
(d) Dharapatta

Q81. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the letter-cluster pair that DOES NOT belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) GI - NP
(b) IK - PR
(c) HJ - OQ
(d) OJ - NL

Q82. TX 12 is related to RS 23 in a certain way. In the same way, GW 2 is related to ER 13. To which of the given options is NR -5 related, following the same logic?

(a) KL 6
(b) LM 6
(c) KM 4
(d) LL 4

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Q83. The average marks of 30 students in a mathematics test were found to be 55. However, it was later discovered that a mark of 72 was mistakenly recorded as 27, and another mark of 64 was mistakenly recorded as 46. What is the actual average score?

(a) 55.5
(b) 60.2
(c) 63.4
(d) 57.1

Q84. 13 men and 3 women can complete a piece of work in 7 days, and 5 men and 6 women can complete the same work in 18 days. The work of how many women is equivalent to that of one man?

(a) 84
(b) 88
(c) 90
(d) 87

Q85. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 1385762, then what will the sum of the digits that are second from the left and third from the right in the new number thus formed be?

(a) 13
(b) 12
(c) 11
(d) 10

Q86. Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pair on the left side of :: is the same as that on the right side of :: ?

: VXB :: GIM : %

(a) = SUY, % = LLP
(b) = SEY, % = JLP
(c) = SUY, % = JLP
(d) = SUY, % = JLL

Q87. Piyush ranked 34th from the top and 57th from the bottom in his class. How many students are there in his class?

(a) 92
(b) 89
(c) 91
(d) 90

Q88. Three numbers are in the ratio 1 : 3 : 5, and their LCM is 285. Their HCF is ____.

(a) 19
(b) 15
(c) 17
(d) 2

Q89. if triangle ABC ~ triangle PQR and (area(triangle ABC))/(area(triangle PQR)) = 25/49 then what is the value of AB:PQ?

(a) 3 : 7
(b) 4 : 7
(c) 2 : 7
(d) 5 : 7

Q90. What should come in place of the question mark (?) in the given series?

282, 259, 226, ?, 130, 67

(a) 193
(b) 183
(c) 173
(d) 186

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Q91. Which of the following is INCORRECT based on the Supreme Court's ruling in 'Samtola Devi vs The State Of Uttar Pradesh', on 27 March 2025, regarding the 'Maintenance and Welfare of Parents and Senior Citizens Act, 2007'?

(a) The Act does not provide any provision for the eviction of a child or relative
(b) Tribunals under the Act have the authority to order the eviction of a child or relative if it is deemed necessary for the protection of the senior citizen.
(c) Eviction of a child or relative is mandatory in every case of neglect under the Act
(d) Senior citizens can file for maintenance even after transferring their property to their legal heirs

Q92. What was the officer responsible for looking after military stores during the reign of the Gupta Empire called?

(a) Pilupati
(b) Mahapratihara
(c) Vishayapati
(d) Ranabhandagarika

Q93. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only. (NOTE: All numbers are single digit numbers only.)

(Left) # 1 9 7 $ 9 1 5 2 @ 6 8 # € £ & 8 $ 4 5 9 5 (Right)

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

(a) 3
(b) 2
(c) 5
(d) 4

Q94. Which shortcut key is used to create a new blank presentation quickly in MS PowerPoint 365?

(a) Ctrl + N
(b) Ctrl + P
(c) Shift + N
(d) Ctrl + O

Q95. Amit had invested same amount of sums at simple as well as compound interest, compounded annually. The time period of both the sums was 2 years and rate of interest too was the same, 4% per annum. At the end, he found a difference of Rs. 45 in both the interests received. What were the sums (in Rs.) invested?

(a) 28,125
(b) 28,475
(c) 27,225
(d) 27,375

Q96. In renal physiology, which segment of the nephron is most critical for generating the osmotic gradient that concentrates urine?

(a) Loop of Henle
(b) Proximal convoluted tubule
(c) Distal convoluted tubule
(d) Collecting duct

Q97. A solid metal hemisphere has a radius of 6 cm. If the metal of the hemisphere is melted and recast into a cylindrical shape with the same radius, find the height of the cylinder.

(a) 4 cm
(b) 12 cm
(c) 8 cm
(d) 6 cm

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Q98. In a certain code language, 'OILY' is coded as '1357' and 'LACE' is coded as '8643'. What is the code for 'L' in the given language?

(a) 7
(b) 3
(c) 8
(d) 5

Q99. A shopkeeper fixes the marked price of an item 50% above its cost price. What percentage of discount on the marked price should be allowed to gain 14%?

(a) 27%
(b) 26%
(c) 24%
(d) 21%

Q100. A student scores 80 marks in a subject with a weightage of 3 and 90 marks in another subject with a weightage of 2. What is the weighted average score of the student?

(a) 84
(b) 82
(c) 86
(d) 88

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Kibithu

The correct answer is Kibithu.

Key Points

• Kibithu is located in the Anjaw district of Arunachal Pradesh, India, and is the easternmost inhabited village near the international border with China.

• It is strategically significant as it lies at the tri-junction of India, China, and Myanmar, making it vital for border security and trade.

• Kibithu is situated at an altitude of approximately 4,070 feet above sea level, offering stunning views of the Lohit River valley.

• This area was a crucial point of engagement during the 1962 Sino-Indian War, and it continues to be a region of strategic importance for India's defense forces.

• Due to its geographical location, Kibithu plays a critical role in monitoring and maintaining the integrity of India's eastern borders.

Additional Information

• Nathu La:

• Located in Sikkim, Nathu La is a mountain pass on the Indo-China border, crucial for trade and military operations.

• It connects India's Sikkim state with China's Tibet Autonomous Region.

• Lipulekh:

• Located in Uttarakhand, Lipulekh Pass serves as a gateway to Kailash Mansarovar in Tibet.
• The pass is part of the disputed Kalapani region claimed by both India and Nepal.
• Rohtang:
• Rohtang Pass is situated in Himachal Pradesh, connecting Kullu Valley with Lahaul and Spiti Valley.
• It is not located near India's international borders.
• India's Easternmost Point:
• The easternmost point of India is not Kibithu but the disputed territory of Vijaynagar in Arunachal Pradesh.
• Kibithu is the easternmost international border settlement in India.

Q2. Answer: (b) 35.62

Shortcut Trick
The Empirical Formula relationship is: (Mode − Median) = 2 × (Median − Mean).
Given: Mode − Median = 71.24.
71.24 = 2 × (Median − Mean).
Median − Mean = 71.24 ÷ 2 = 35.62.
Therefore The correct answer is 35.62.
Alternate Method
Given: Mode − Median = 71.24
Formula: Mode = 3 × Median − 2 × Mean
=> Mode − Median = 71.24
=> (3 × Median − 2 × Mean) − Median = 71.24
=> 2 × Median − 2 × Mean = 71.24
=> 2(Median − Mean) = 71.24
=> Median − Mean = 71.24 ÷ 2
=> Median − Mean = 35.62
Therefore The correct answer is 35.62.
Additional Information
<

Q3. Answer: (d) 12,000

Shortcut Trick
Difference in Rate = 6.5% − 3.5% = 3% per annum.
Total difference for 2 years = 3% × 2 = 6%.
Positive difference in Simple Interest = 6% of Rs. 2,00,000.
Difference = 0.06 × 2,00,000 = Rs. 12,000.
Therefore The correct answer is Rs. 12,000.
Alternate Method
Given:
Principal (P) = Rs. 2,00,000 for each bank
Rate of Bank A (R1) = 3.5%
Rate of Bank B (R2) = 6.5%
Time (T) = 2 years
Formula Used:
Simple Interest (SI) = (P × R × T) / 100
Calculations:
=> SI paid to Bank A = (2,00,000 × 3.5 × 2) / 100
=> SI_A = 2,000 × 7 = Rs. 14,000
=> SI paid to Bank B = (2,00,000 × 6.5 × 2) / 100
=> SI_B = 2,000 × 13 = Rs. 26,000
=> Positive Difference = SI_B − SI_A
=> Difference = Rs. 26,000 − Rs. 14,000 = Rs. 12,000
Therefore The correct answer is Rs. 12,000.

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Additional Information

Amount in Simple Interest

The total Amount (A) is the sum of Principal (P) and Simple Interest (SI): A = P + SI.

Interest Variation

Simple interest is directly proportional to Rate and Time. If Rate increases by x%, interest increases by (P × x × T) / 100.

SI vs CI Difference

For 2 years, the difference between Compound Interest and Simple Interest is given by: D = P(R/100)².

Q4. Answer: (b) 1st Administrative Reforms Commission

The correct answer is 1st Administrative Reforms Commission.

Key Points

• The 1st Administrative Reforms Commission (ARC) was established in 1966 under the chairmanship of Morarji Desai to review and recommend changes to the administrative structure of India.

• The Commission submitted its reports over the next few years, covering various aspects of administration such as personnel management, financial administration, and center-state relations.

• It focused on reforms in governance to make the Indian administrative system more efficient, transparent, and responsive to the needs of citizens.

• The 1st ARC produced 20 detailed reports, which included over 500 actionable recommendations.

• Some of the key areas addressed included administrative accountability, ethics in governance, and citizen-centric services.

Additional Information

• Administrative Reforms Commission (ARC):

• The ARC is constituted by the government to examine the state of public administration and suggest reforms.

• The recommendations of the 1st ARC laid the foundation for modern governance reforms in India.

• Its reports covered areas such as local governance, interdepartmental coordination, and the role of public sector enterprises.

• Morarji Desai:

• He was the 4th Prime Minister of India and served from 1977 to 1979.

• Desai was known for his integrity, administrative skills, and commitment to governance reforms.

• He played a vital role in shaping India's administrative policies during his tenure as a public servant and leader.

• Key Impact of the 1st ARC:

• The reports influenced the creation of institutions such as the Central Vigilance Commission (CVC) and reforms in personnel management.

• It emphasized the importance of ethics, accountability, and citizen participation in governance.

• Subsequent ARCs:

• The 2nd Administrative Reforms Commission (2005-2009) built upon the recommendations of the 1st ARC.

• It focused on improving governance in areas such as disaster management, e-governance, and local self-governance.

Q5. Answer: (c) 14%

Shortcut Trick

Cost Increase = 1,93,900 − 1,70,014 = 23,886

Percentage Increase = (23,886 ÷ 1,70,014) × 100

Approximation: 23,886 ≈ 24,000 and 1,70,014 ≈ 1,70,000

24 ÷ 170 × 100 ≈ 14.1%

Therefore The correct answer is 14%.

Alternate Method

Given:

Present Cost (Initial Value) = Rs. 1,70,014

New Cost (Final Value) = Rs. 1,93,900

Formula Used:

Percentage Increase = [(Final Value − Initial Value) ÷ Initial Value] × 100

Calculations:

=> Absolute Increase = 1,93,900 − 1,70,014 = 23,886

=> Percentage Increase = (23,886 ÷ 1,70,014) × 100

=> Percentage Increase = 0.14049... × 100

=> Percentage Increase ≈ 14.05%

=> Rounded to nearest integer = 14%

Therefore The correct answer is 14%.

Additional Information

Percentage Change

It represents the relationship between an old value and a new value. Formula: (Change ÷ Original Value) × 100.

Rounding Off Rules

If the decimal part is 0.5 or greater, round up to the next integer; if less than 0.5, keep the current integer part.

Appreciation and Depreciation

Appreciation refers to an increase in the value of an asset over time, while Depreciation refers to a decrease.

Q6. Answer: (c) 69

The logic followed here is:

Thus, the missing term in the series is 69.

Hence, the correct answer is "Option 3";

Q7. Answer: (b) 25

Shortcut Trick

Let initial Selling Price (SP) be 100 and Profit be P. New SP = 200 and New Profit = 6P.

Profit difference = (200 − 100) = 100.

In terms of P, Profit difference = 6P − P = 5P.

5P = 100 => P = 20. Initial CP = SP − P = 100 − 20 = 80.

Profit% = (20 ÷ 80) × 100 = 25%.

Therefore The correct answer is 25%.

Alternate Method

Given: New SP = 2 × Initial SP, New Profit = 6 × Initial Profit.

Formulas: Profit = SP − CP | Profit% = (Profit ÷ CP) × 100

=> Let initial Cost Price be CP and initial Selling Price be SP.

=> Initial Profit (P) = SP − CP.

=> New Selling Price = 2SP. New Profit = 2SP − CP.

=> According to question: 2SP − CP = 6(SP − CP).

=> 2SP − CP = 6SP − 6CP => 5CP = 4SP => SP = 1.25CP.

=> Profit = 1.25CP − CP = 0.25CP.

=> Profit% = (0.25CP ÷ CP) × 100 = 25%.

Therefore The correct answer is 25%.

Additional Information

Relationship between SP and Profit

When CP remains constant, any increase in Selling Price directly adds to the Profit amount. The change in profit is equal to the change in selling price.

Profit Percentage

Profit% is always calculated on the Cost Price (CP) unless otherwise specified in the problem statement.

Q8. Answer: (c) 10

Shortcut Trick

Identify the prime factors of 6760.

6760 = 676 × 10 = 26^2 × 2 × 5.

Pairs: (26 × 26) is already a perfect square.

Unpaired factors: 2 × 5 = 10.

To make it a perfect square, multiply by the unpaired factors (10).

Therefore The correct answer is 10.

Alternate Method

Given: The number is 6760.

Formula Used: A number is a perfect square if all its prime factors occur in pairs.

Calculations:

=> Prime Factorization of 6760:

=> 6760 = 2 × 3380

=> 3380 = 2 × 1690

=> 1690 = 2 × 845

=> 845 = 5 × 169

=> 169 = 13 × 13

=> 6760 = 2 × 2 × 2 × 5 × 13 × 13

=> Grouping in pairs: (2 × 2) × (13 × 13) × 2 × 5

=> The unpaired factors are 2 and 5.

=> Smallest number to multiply = 2 × 5 = 10.

Therefore The correct answer is 10.

Additional Information

Perfect Square Property

In the prime factorization of a perfect square, the exponent of every prime factor must be even.

Making a Perfect Square (Division)

To make a number a perfect square by division, we divide by the same unpaired factors (e.g., 6760 ÷ 10 = 676, which is 26^2).

Unit Digits of Perfect Squares

A perfect square never ends in the digits 2, 3, 7, or 8.

Q9. Answer: (c) Right to Freedom of Speech and Expression

The correct answer is Right to Freedom of Speech and Expression.

Key Points

• The First Amendment Act of 1951 brought additional restrictions to the Right to Freedom of Speech and Expression under Article 19(1)(a) of the Constitution of India.

• It introduced provisions allowing the state to impose "reasonable restrictions" on this right in the interests of public order, security, decency, morality, sovereignty, and integrity of India.

• The amendment was enacted to address issues arising from judicial interpretations that had invalidated several laws restricting speech and expression.

• The Act also added Article 19(2), which explicitly states the grounds on which the government can limit the right to freedom of speech and expression.

• This amendment was a response to decisions like the Romesh Thapar vs State of Madras case, where the Supreme Court struck down laws restricting press freedom.

Additional Information

• Fundamental Rights in India:

• Fundamental Rights are enshrined in Part III of the Indian Constitution and are considered essential for individual freedom and democracy.

• They include rights such as equality, freedom, protection against exploitation, freedom of religion, and constitutional remedies.

• These rights are enforceable by the judiciary and can be challenged in a court of law.

• Article 19(1) of the Indian Constitution:

• Article 19(1) guarantees six freedoms to citizens, including the right to freedom of speech and expression.

• These freedoms are subject to reasonable restrictions for maintaining public order, morality, and sovereignty.

• Romesh Thapar vs State of Madras (1950):

• This landmark case challenged restrictions imposed on the press under public order laws.

• The Supreme Court invalidated these laws, prompting the government to introduce the First Amendment Act.

• Reasonable Restrictions:

• The First Amendment introduced the concept of "reasonable restrictions" to ensure a balance between individual freedom and societal interests.

• Grounds for restriction include security, sovereignty, morality, and public order.

Q10. Answer: (b) 56 km towards the west

Given:

Gyanesh starts from Point Y and drives 11 km towards the south.

He then takes a left turn, drives 45 km, turns right and drives 29 km. He then takes a right turn and drives 18 km.

He takes a right turn, drives 13 km. He then turns right, drives 29 km, turns left and drives 27 km to stop at Point Z.

Thus, Gyanesh has to drive 56 km west to reach point Y.

Hence, the correct answer is "Option 2".

Q11. Answer: (d) 10 : 15

Shortcut Trick

Convert all ratios to decimal form for immediate comparison.

19 ÷ 37 ≈ 0.51, 15 ÷ 33 ≈ 0.45, 18 ÷ 37 ≈ 0.48, 10 ÷ 15 ≈ 0.66.

Since 0.66 is the largest decimal value, 10 : 15 is the greatest ratio.

Therefore The correct answer is 10 : 15.

Alternate Method

Given: Ratios are 19/37, 15/33, 18/37, and 10/15.

Formula Used: Ratio Comparison (Fraction to Decimal conversion or LCM method).

=> Option (1): 19/37 ≈ 0.5135

=> Option (2): 15/33 = 5/11 ≈ 0.4545

=> Option (3): 18/37 ≈ 0.4864

=> Option (4): 10/15 = 2/3 ≈ 0.6666

=> Comparing all decimal values: 0.6666 > 0.5135 > 0.4864 > 0.4545

Therefore The correct answer is 10 : 15.

Additional Information

Ratio Comparison Rules

When comparing fractions a/b and c/d, if a × d > b × c, then a/b > c/d.

Numerator/Denominator Logic

If denominators are same, the ratio with the larger numerator is greater. If numerators are same, the ratio with the smaller denominator is greater.

Percentage Conversion

Ratios can be multiplied by 100 to compare them as percentages (e.g., 2/3 = 66.66%).

Q12. Answer: (b) −3

The given numbers are:

143, 656, 651, 264, 282

The highest and lowest numbers.

The highest number is 656.

The lowest number is 143.

The required digits.

The first digit of the highest number (656) is 6.

The third digit of the lowest number (143) is 3.

As per the question, the first digit of the highest number is subtracted from the third digit of the lowest number.

Resultant = 3 - 6 = -3.

Hence, the correct answer is "Option 2".

Q13. Answer: (b) 43

Shortcut Trick

Let the larger diameter be D and smaller diameter be d.

Given: $D - d = 2$ and $\pi D^2 - \pi d^2 = 528$

$\pi(D^2 - d^2) = 528 \Rightarrow \pi(D - d)(D + d) = 528$

$(22/7) \times 2 \times (D + d) = 528 \Rightarrow D + d = 84$

Adding equations: $2D = 86 \Rightarrow D = 43$ cm.

Therefore The correct answer is 43 cm.

Alternate Method

Given:

Difference in diameters = 2 cm

Difference in surface areas = 528 cm²

Formula Used:

Surface area of sphere = $4\pi r^2 = \pi d^2$ (where d is diameter)

Calculations:

Let diameter of larger sphere = D and smaller sphere = d

=> D = d + 2

=> Surface Area difference = $\pi D^2 - \pi d^2 = 528$

=> $(22/7) \times (D^2 - d^2) = 528$

=> $D^2 - d^2 = (528 \times 7) \div 22$

=> $(D - d)(D + d) = 24 \times 7$

=> $2 \times (D + d) = 168$

=> D + d = 84

=> (d + 2) + d = 84

=> 2d = 82 => d = 41 cm

=> D = 41 + 2 = 43 cm

Therefore The correct answer is 43 cm.

Additional Information

Volume of Sphere

The volume of a sphere is given by $(4/3)\pi r^3$ or $(1/6)\pi d^3$.

Hemisphere Properties

Curved Surface Area = $2\pi r^2$ and Total Surface Area = $3\pi r^2$.

Ratio of Surface Areas

If the ratio of radii of two spheres is a:b, then the ratio of their surface areas is $a^2:b^2$.

Q14. Answer: (b) 1857

The correct answer is 1857.

Key Points

• The revolt of 1857, also known as the First War of Independence or Sepoy Mutiny, led to significant changes in British military policies in India.

• Post-1857, the proportion of Indian soldiers in the army was systematically reduced while the number of European soldiers increased significantly to prevent future rebellions.

• The British reorganized the Indian Army by increasing the ratio of European to Indian soldiers from 1:6 to 1:2 in critical areas.

• Key changes included stricter recruitment policies, favoring soldiers from certain regions and communities such as Punjabis and Gurkhas, who were considered more loyal.

• The British also positioned European troops in strategically important locations and ensured their control over key artillery units.

Additional Information

• Revolt of 1857:

• It was triggered by multiple factors, including resentment against British policies, economic exploitation, and the introduction of the Enfield rifle cartridges rumored to be greased with cow and pig fat.

• The revolt began in Meerut and quickly spread across northern and central India, involving soldiers, peasants, and local rulers.

• Prominent leaders included Rani Lakshmibai of Jhansi, Tantia Tope, Nana Sahib, and Begum Hazrat Mahal.

• British Military Reforms Post-1857:

• The command structure of the army was centralized under British control.

• Significant investments were made in infrastructure, such as railways and telegraphs, to enable rapid troop movement.

• European officers were placed in key positions, and Indian soldiers were deliberately kept away from sensitive areas like artillery.

• Impact of the Revolt:

• The revolt led to the end of the East India Company's rule, and governance was transferred directly to the British Crown under the Government of India Act 1858.

• It also marked a shift in British policies, with a focus on consolidating power and preventing further uprisings.

• Terminology:

• "Sepoy Mutiny" is a term used by British historians, while Indian historians often refer to it as the "First War of Independence."

• The term "divide and rule" was implemented more rigorously post-1857 to maintain control by exploiting religious and regional divisions.

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Q15. Answer: (b) KGOL

The logic followed here is:

• Letter Shift: Each letter is shifted backward by 2 positions.

Applying the logic to the given pairs:

GCKH is related to EAIF

JFNK is related to HDLI

Applying the logic to MIQN:

Following this logic, MIQN is related to KGOL.

Hence, the correct answer is "Option 2".

Q16. Answer: (b) 4

Given: Seven boxes, A, B, C, D, E, F and G, are kept one over the other. The lowermost box is numbered 1 and the topmost is numbered 7.

Only three boxes are kept above G.

7	
6	
5	
4	G
3	
2	
1	

Only one box is kept between A and G.

F is kept at some place above G.

Only three boxes are kept between A and F.

Position	**Box**
7	
6	F
5	
4	G
3	
2	A
1	

B is kept immediately below F.

Position	**Box**
7	
6	F
5	B
4	G
3	
2	A
1	

C is not kept immediately above or below A.

D is kept at one of the places above E.

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Position	Box
7	C
6	F
5	B
4	G
3	D
2	A
1	E

Therefore, Four boxes are kept above D.

Hence, the correct answer is "Option 2".

Q17. Answer: (b) Bareilly Uprisings

The correct answer is Bareilly Uprisings.

Key Points

• The Bareilly Uprisings were an important revolt against British rule in India, occurring in the early 19th century, prior to the First War of Independence in 1857.

• These uprisings were led by Mufti Muhammad Aiwaz, who played a critical role in mobilizing resistance against British colonial policies.

• The revolt primarily took place in the Bareilly region of present-day Uttar Pradesh and reflected the growing unrest among Indian communities under British rule.

• The uprising was driven by widespread dissatisfaction with British economic exploitation, religious interference, and administrative policies.

• The Bareilly Uprisings are considered significant precursors to the larger and more organized rebellions that culminated in the Revolt of 1857.

Additional Information

• Revolt of 1857:

• The Revolt of 1857, also known as India's First War of Independence, marked a significant uprising against British rule in India.

• It was sparked by a combination of political, economic, social, and military grievances, including the introduction of the Enfield rifle cartridge rumored to be greased with cow and pig fat.

• The revolt was led by various leaders across regions, including Rani Lakshmibai, Tantia Tope, Bahadur Shah Zafar, and Nana Saheb.

• The uprising was ultimately suppressed by the British, but it marked a turning point in India's struggle for independence.

• Other Regional Uprisings Pre-1857:

• Kol Uprisings: Tribal rebellion in the Chotanagpur region (1831-1832) against British exploitation and land revenue policies.

• Santhal Rebellion: A tribal revolt in 1855-1856 in present-day Jharkhand, led by Sidhu and Kanhu Murmu, against oppressive landlords and British policies.

• Chuar Rebellion: A series of uprisings in Bengal and Bihar during the late 18th century by tribal communities resisting British revenue collection.

• Mufti Muhammad Aiwaz:

• Mufti Muhammad Aiwaz was a prominent leader of the Bareilly Uprisings and played a crucial role in uniting people against British authority.

• He symbolized resistance to British interference in the religious and social practices of Indian communities.

• Impact of Early Uprisings:

• These early uprisings highlighted the growing resentment among Indians toward British policies and exploitation.

• They laid the foundation for organized resistance movements in the 19th and 20th centuries, culminating in India's independence in 1947.

Q18. Answer: (b) 3

Shortcut Trick

By the Secant-Secant Power Theorem for external intersection:

PA × PB = PC × PD

=> (PB + AB) × PB = (PD + CD) × PD

=> (PB + 7) × PB = (5 + 1) × 5 = 30

By testing the options, if PB = 3 cm, then (3 + 7) × 3 = 10 × 3 = 30, which perfectly satisfies the equation.

Therefore The correct answer is 3 cm.

Alternate Method

Given:

Length of chord AB = 7 cm

Length of chord CD = 1 cm

Length of external segment PD = 5 cm

Formula Used:

When two chords AB and CD of a circle intersect externally at an external point P, the product of the segments of one secant is equal to the product of the segments of the other secant:

PA × PB = PC × PD

Calculations:

Let the length of PB be x cm.

=> PA = PB + AB = x + 7 cm

=> PC = PD + CD = 5 + 1 = 6 cm

Applying the secant-secant power theorem:

=> PA × PB = PC × PD

=> (x + 7) × x = 6 × 5

=> $x^2 + 7x = 30$

=> $x^2 + 7x - 30 = 0$

=> $x^2 + 10x - 3x - 30 = 0$

=> x(x + 10) − 3(x + 10) = 0

=> (x − 3)(x + 10) = 0

=> x = 3 or x = −10

Since length cannot be negative, we discard x = −10.

=> x = 3 cm

Option Analysis:

=> Option (1) - 5 cm: If PB = 5 cm, then PA × PB = (5 + 7) × 5 = 60 ≠ 30. Thus, this option is incorrect.

=> Option (2) - 3 cm: If PB = 3 cm, then PA × PB = (3 + 7) × 3 = 30, which matches PC × PD = 30. Thus, this option is correct.

=> Option (3) - 4 cm: If PB = 4 cm, then PA × PB = (4 + 7) × 4 = 44 ≠ 30. Thus, this option is incorrect.

=> Option (4) - 2 cm: If PB = 2 cm, then PA × PB = (2 + 7) × 2 = 18 ≠ 30. Thus, this option is incorrect.

Therefore The correct answer is 3 cm.

Additional Information

Intersecting Chords Theorem (Internal Intersection)

If two chords AB and CD of a circle intersect internally at a point P, then PA × PB = PC × PD.

Tangent-Secant Theorem

If a tangent segment PT and a secant segment PAB are drawn to a circle from an exterior point P, then $PT^2 = PA \times PB$.

Properties of Secants from an External Point

The product of the external secant segment and the entire secant segment is constant for any secant line drawn from a given external point to the circle.

Q19. Answer: (d) A shallow trough or geosyncline

The correct answer is A shallow trough or geosyncline.

Key Points

• The Indo-Gangetic Plain, also called the Great Plain, was formed due to the gradual filling of a shallow trough or geosyncline that existed between the Himalayas and the Deccan Plateau.

• This geosyncline, known as the Tethys Sea, was a depression that existed millions of years ago during the Mesozoic era.

• Over time, sediments from the rising Himalayas and other sources filled this trough, leading to the formation of the vast alluvial plains of Northern India.

• The process of sedimentation was facilitated by rivers like the Indus, Ganga, and Brahmaputra, which transported eroded material from the mountains to the plains.

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• The Great Plain is now one of the most fertile regions in the world, supporting agriculture and a dense population.

Additional Information

• Geosyncline:

• A geosyncline is a large-scale depression in the Earth's crust filled with thick layers of sediments.

• It often forms in areas where two tectonic plates converge, leading to subsidence and sediment accumulation.

• Over geological time, geosynclines may become mountain ranges or plains due to tectonic uplift and erosion.

• Tethys Sea:

• The Tethys Sea was a prehistoric ocean that existed between the ancient continents of Laurasia (to the north) and Gondwana (to the south).

• It played a key role in the tectonic evolution of Asia, Europe, and the Indian subcontinent.

• Its closure due to the collision of the Indian Plate with the Eurasian Plate led to the uplift of the Himalayas.

• Himalayan Sedimentation:

• The Himalayas are the primary source of sediments that filled the Indo-Gangetic trough.

• Rivers originating from the Himalayas carry eroded materials and deposit them in the plains.

• This sedimentation process has been ongoing for millions of years, shaping the fertile plains.

• Indo-Gangetic Plain:

• One of the world's largest alluvial plains, extending over 7 lakh square kilometers across India, Pakistan, and Bangladesh.

• It is drained by major rivers, including the Ganga, Yamuna, Brahmaputra, and their tributaries.

• The plain is known for its rich soil, which supports intensive agriculture and sustains a high population density.

Q20. Answer: (a) 18

Shortcut Trick

Assume first distance is 84 km. Then second distance is 168 km. Total forward distance = 252 km.

Forward time = (84 ÷ 84) + (168 ÷ 28) = 1 + 6 = 7 hours.

Total journey distance = 252 + 252 = 504 km.

Total time = Total Distance ÷ Average Speed = 504 ÷ 24 = 21 hours.

Return time = 21 − 7 = 14 hours. Return speed = 252 ÷ 14 = 18 km/hr.

Therefore The correct answer is 18 km/hr.

Alternate Method

Given: Speed 1 = 84 km/hr, Distance 1 = d; Speed 2 = 28 km/hr, Distance 2 = 2d; Average Speed = 24 km/hr.

Formula Used: Average Speed = Total Distance ÷ Total Time

=> Total Distance = d + 2d + 3d = 6d

=> Total Time = (d ÷ 84) + (2d ÷ 28) + (3d ÷ V)

=> 24 = 6d ÷ [(d/84) + (6d/84) + (3d/V)]

=> 24 = 6d ÷ [(7d/84) + (3d/V)]

=> 24 = 6 ÷ [(1/12) + (3/V)]

=> (1/12) + (3/V) = 6/24 = 1/4

=> 3/V = (1/4) − (1/12) = 2/12 = 1/6

=> V = 18 km/hr

Therefore The correct answer is 18 km/hr.

Additional Information

Average Speed Formula

For unequal distances, Average Speed = (d1 + d2 + ... + d_n) ÷ (t1 + t2 + ... + t_n).

Special Case: Equal Distances

If a person travels two equal distances at speeds x and y, the average speed is (2xy) ÷ (x + y).

Time and Distance Relation

Speed is inversely proportional to time when distance is constant: S1/S2 = T2/T1.

Q21. Answer: (c) Rajasthan

The correct answer is Rajasthan.

Key Points

• The annual publication 'State of India's Environment' was released on 26 February 2025 by the Centre for Science and Environment (CSE) and Down To Earth (DTE).

• This report provides an in-depth analysis of India's environmental challenges and tracks the country's progress in addressing them.

• The publication was released from Rajasthan, which has often been at the forefront of environmental discussions due to its unique ecological challenges.

• The report covers topics such as climate change, air pollution, water resources, waste management, and biodiversity conservation.

• It serves as a critical resource for policymakers, researchers, and environmental advocates to understand and address pressing environmental issues.

Additional Information

• Centre for Science and Environment (CSE):

• CSE is a public interest research and advocacy organization based in New Delhi, India.

• It focuses on sustainable development, climate change, environmental education, and policy analysis.

• Its mission is to promote equitable and sustainable use of natural resources and advocate for environmental justice.

• Down To Earth (DTE):

• DTE is a fortnightly magazine published by CSE, specializing in environmental, science, and development news.

• It provides insights into critical issues such as climate change, pollution, and resource management.

• The magazine is widely recognized for its investigative journalism and in-depth reports.

• State of India's Environment Report:

• The report is an annual publication by CSE and DTE, offering a comprehensive overview of India's environmental status.

• It highlights trends, data, and analysis on key environmental issues affecting the country.

• The report serves as a benchmark for tracking progress in environmental conservation and sustainable development.

• Rajasthan's Environmental Context:

• Rajasthan faces unique environmental challenges, including desertification, water scarcity, and biodiversity loss.

• The state has implemented various initiatives, such as afforestation and water conservation programs, to address these issues.

• It is a significant location for discussions on sustainable development due to its ecological importance.

Q22. Answer: (b) 32

The correct answer is 32.

Key Points

• Behramji Merwanji Malabari's 'The Indian Muse in English Garb' is a collection of poems published in 1876.

• The book comprises a total of 32 poems, showcasing the blending of Indian themes with English literary styles.

• Malabari was a notable Indian poet and social reformer, known for his advocacy against child marriage and for women's rights.

• The poems in the collection reflect themes of patriotism, spirituality, and social issues relevant to Indian society during the colonial era.

• This work exemplifies the cultural exchange between India and England during British rule.

Additional Information

• Behramji Malabari:

• Born in 1853 in Baroda, Malabari was a prominent Indian poet, writer, and social reformer.

• He is best known for his efforts to abolish child marriage and improve the status of women in India.

• His writings combined progressive social ideas with literary creativity.

• Indian Literature in English:

• The late 19th century marked the rise of Indian authors writing in English, as part of cultural assimilation during British rule.

• Works such as 'The Indian Muse in English Garb' showcased Indian themes rendered in English literary tradition.

• This genre helped bridge cultural gaps and introduced Indian perspectives to Western audiences.

• Colonial Influence on Indian Writing:

• During British rule, Indian writers adopted English as a medium to express social, political, and cultural narratives.

• It led to the evolution of Indo-Anglian literature, which remains a significant part of Indian literary heritage.

• Social Reform in 19th Century India:

• The period saw the emergence of reformers like Malabari, who sought to address issues such as child marriage, widow remarriage, and women's education.

• Literature often served as a vehicle for promoting these reformist ideas.

Q23. Answer: (b) 19.4%

The correct answer is 0.194.

Key Points

• India's external debt to GDP ratio at the end of September 2024 was 19.4% (0.194), indicating a moderate level of external debt relative to its GDP.

• This ratio is a critical indicator of a country's ability to manage and repay its external debt obligations efficiently.

• A lower external debt-to-GDP ratio is generally considered favorable as it reflects a lower debt burden in comparison to the country's economic output.

• India has consistently maintained a sustainable external debt level, supported by its strong foreign exchange reserves.

• The Reserve Bank of India (RBI) periodically monitors and publishes data on the country's external debt to ensure transparency and economic stability.

Additional Information

• External Debt:

• External debt refers to the total borrowing by a country from foreign lenders, including governments, financial institutions, and private entities.

• It typically includes loans, bonds, and other financial instruments owed to non-residents.

• External Debt to GDP Ratio:

• This ratio is calculated by dividing a country's total external debt by its Gross Domestic Product (GDP).

• A lower ratio indicates that the country's economic output is sufficient to cover its debt obligations, reducing the risk of default.

• India's External Debt Composition:

• India's external debt is categorized into short-term and long-term debt, with long-term debt constituting a significant share.

• Major components include commercial borrowings, NRI deposits, and multilateral loans.

• Role of Foreign Exchange Reserves:

• India's foreign exchange reserves act as a buffer to manage external debt obligations and ensure economic stability.

• As of recent years, India has maintained substantial reserves to meet its debt servicing requirements comfortably.

Q24. Answer: (b) 24 m²

Shortcut Trick

Directly substitute x = 2 and y = 1 into the diagonal expressions.

d1 = (1 + 2×1 + 5) = 8 m

d2 = (1 − 2×1 + 7) = 6 m

Area = (1/2) × d1 × d2 = (1/2) × 8 × 6 = 24 m².

Therefore The correct answer is 24 m².

Alternate Method

Given:

First diagonal (d1) = (y + xy + 5) m

Second diagonal (d2) = (y − xy + 7) m

Values: x = 2, y = 1

Formula Used:

Area of Rhombus = (1/2) × d1 × d2

Calculations:

=> d1 = 1 + (2 × 1) + 5

=> d1 = 1 + 2 + 5 = 8 m

=> d2 = 1 − (2 × 1) + 7

=> d2 = 1 − 2 + 7 = 6 m

=> Area = (1/2) × 8 × 6

=> Area = 4 × 6 = 24 m²

Therefore The correct answer is 24 m².

Additional Information

Properties of Rhombus

All four sides are equal, and diagonals bisect each other at 90°.

Side and Diagonal Relationship

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$4 \times (\text{side})^2 = d1^2 + d2^2$. This is derived from the Pythagoras Theorem in the internal triangles.

Perimeter of Rhombus

Perimeter = 4 × side. If only diagonals are known, side = $(1/2) \times \sqrt{(d1^2 + d2^2)}$.

Q25. Answer: (d) FXL : CUM

The logic followed here is :

KNR : HKS

TGK : QDL

Now,

Option 1: LOQ : FJU

Option 2: HMI : DKL

Option 3: GCP : EHR

Option 4: FXL : CUM

Thus, Option 4 follows the correct logic.

Hence, the correct answer is "Option 4".

Q26. Answer: (c) democratic governance and empowerment at the grassroots level

The correct answer is democratic governance and empowerment at the grassroots level.

Key Points

• The Panchayati Raj system in India was introduced to ensure decentralized governance and empower local bodies.

• It was formally established through the 73rd Constitutional Amendment Act, 1992, which added Part IX to the Constitution.

• The system provides a platform for grassroots democracy by enabling local self-government in rural areas.

• It aims to empower villagers by involving them in decision-making processes and ensuring effective implementation of developmental programs.

• Key principles include decentralization, transparency, and accountability to promote inclusive development.

Additional Information

• 73rd Constitutional Amendment Act, 1992

• This act provided a constitutional status to Panchayati Raj institutions.

• It mandated the creation of a three-tier system: Gram Panchayat, Panchayat Samiti, and Zilla Parishad.

• It introduced the concept of reservations for Scheduled Castes, Scheduled Tribes, and women in Panchayati Raj institutions.

• Article 243A allows the Gram Sabha to function as the foundation of grassroots democracy.

• Key Features of Panchayati Raj

• Regular elections every 5 years to ensure accountability.

• State governments are required to establish a State Election Commission to oversee these elections.

• State Finance Commissions are constituted to recommend the allocation of financial resources to Panchayats.

• Significance of Grassroots Democracy

• Empowers local communities by allowing them to identify their needs and priorities.

• Promotes social inclusion by involving marginalized sections in governance.

• Enhances governance efficiency by addressing issues at the local level.

• Challenges in Implementation

• Lack of financial autonomy and dependency on state governments.

• Inadequate capacity building and training for elected representatives.

• Uneven development due to socio-economic disparities in rural areas.

Q27. Answer: (c) American Standard Code for Information Interchange

The correct answer is American Standard Code for Information Interchange.

Key Points

• ASCII stands for American Standard Code for Information Interchange, a character encoding standard for electronic communication.

• It was first published in 1963 by the American National Standards Institute (ANSI) as a standardized way to represent text in computers.

• ASCII uses 7-bit binary numbers to represent 128 different characters, including letters, digits, punctuation marks, and control characters.

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• It is widely used in computers, communication devices, and other electronic systems to represent text data.

• The extended ASCII version (8-bit) includes an additional 128 characters, making it compatible with more languages and symbols.

Additional Information

• Control Characters:

• ASCII includes control characters like carriage return (CR), line feed (LF), and tab, which are used for text formatting and communication control.

• These characters do not represent printable symbols but perform specific functions in data transmission and processing.

• Unicode:

• Unicode is a more modern character encoding standard that extends ASCII, allowing representation of characters from virtually all languages and symbols.

• While ASCII uses 7 bits, Unicode can use up to 32 bits for encoding, making it more versatile for global applications.

• Binary Representation:

• Each ASCII character is represented by a unique binary code, such as 01000001 for the letter 'A'.

• This binary representation ensures compatibility with digital systems.

• Applications of ASCII:

• ASCII is used in programming, file formats, and data storage to ensure consistency in text representation.

• It is the basis for text encoding in protocols like HTTP, SMTP, and FTP.

Q28. Answer: (d) Article 143

The correct answer is Article 143.

Key Points

• Article 143 of the Indian Constitution empowers the President to seek the opinion of the Supreme Court on questions of law or fact that are of public importance.

• The advice provided by the Supreme Court under Article 143 is not binding on the President; it is advisory in nature.

• This provision is often referred to as the "Advisory Jurisdiction" of the Supreme Court.

• Article 143 is invoked to resolve complex legal or constitutional matters that require judicial interpretation.

• The President can exercise this power either on his own discretion or based on advice from the Council of Ministers.

Additional Information

• Advisory Jurisdiction:

• It is a unique feature of the Indian judiciary under Article 143, allowing the Supreme Court to provide opinions on matters referred by the President.

• Examples include cases related to the Berubari Union and the Ayodhya dispute.

• The court's opinion is purely advisory and does not have the force of a judicial decision.

• Other Relevant Articles:

• Article 131: Deals with the original jurisdiction of the Supreme Court in disputes between states or between the union and states.

• Article 136: Provides the Supreme Court discretionary power to grant special leave to appeal against any judgment or order.

• Article 226: Empowers High Courts to issue writs for enforcement of fundamental rights and other matters.

• Role of the President:

• The President acts as the constitutional head of the country and exercises powers based on provisions like Article 143.

• The decision to seek advice under Article 143 is often made based on significant national or legal concerns.

• Importance of Article 143:

• Article 143 ensures clarity and resolution in intricate legal and constitutional matters.

• It strengthens the consultative mechanism between the executive and the judiciary.

Q29. Answer: (b) 173

BODMAS Rule:

According to the question, the signs are interchanged as follows:

Original Symbol	**•**	**−**	**×**	**÷**
New Symbol	−	×	÷	•

Now, given the equation: 96 × 6 − 8 ÷ 71 + 26 = ?

After interchanging the specified signs, the new equation is:

96 ÷ 6 × 8 + 71 − 26 = ?

Perform operations according to BODMAS:

=> 96 ÷ 6 × 8 + 71 − 26

=> 16 × 8 + 71 − 26

=> 128 + 71 − 26

=> 199 − 26 = 173

Hence, the correct answer is "Option 2".

Q30. Answer: (d) 52

Shortcut Trick

Let the three numbers be 5x, 16x, and 21x.

Given: 20% of 5x = 26 → 1/5 × 5x = 26 => x = 26.

Difference between third and second = 21x − 16x = 5x.

Required value = 40% of 5x = 2/5 × 5 × 26 = 52.

Therefore The correct answer is 52.

Alternate Method

Given: Ratio = 5 : 16 : 21. 20% of first number = 26.

Formula Used: Value = (Percentage × Total) ÷ 100

=> Let the numbers be 5k, 16k, and 21k.

=> 20% of 5k = 26

=> (20/100) × 5k = 26

=> 1/5 × 5k = 26 => k = 26.

=> Difference of third and second number = 21k − 16k = 5k.

=> Required value = 40% of 5k

=> (40/100) × 5 × 26

=> 2/5 × 130 = 52.

Therefore The correct answer is 52.

Additional Information

Ratio and Proportion

A ratio indicates how many times one number contains another. If a : b = c : d, then a × d = b × c.

Percentage to Fraction Conversion

To simplify calculations, convert % to fractions: 20% = 1/5, 40% = 2/5, 60% = 3/5, 80% = 4/5.

Successive Percentage

If a value is changed by x% and then y%, net change = [x + y + (xy/100)]%.

Q31. Answer: (c) HAD

The logic followed here is:

Thus, the missing letter in the series is HAD.

Hence, the correct answer is "Option 3".

Q32. Answer: (d) To reduce environmental hazards by eliminating incineration

The correct answer is To reduce environmental hazards by eliminating incineration.

Key Points

• 'Srjanam' is a biomedical waste conversion system launched in 2025, aimed at addressing environmental concerns arising from traditional waste disposal methods.

• The primary objective of the system is to eliminate the use of incineration, which is known to release harmful pollutants such as dioxins and furans into the environment.

• It focuses on converting biomedical waste into eco-friendly byproducts through advanced scientific techniques.

• The initiative is designed to reduce landfill dependency and promote sustainable waste management practices.

• By adopting innovative technology, 'Srjanam' seeks to minimize environmental hazards and align with global efforts to combat climate change.

Additional Information

• Biomedical Waste:

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• Biomedical waste refers to waste generated during the diagnosis, treatment, or immunization of humans or animals.
• It includes sharps, infectious materials, pathological waste, and pharmaceutical waste.
• Improper disposal of biomedical waste poses risks to human health and the environment.
• Incineration:
• Incineration is a waste disposal method that involves burning materials at high temperatures.
• It is commonly used for biomedical waste but releases toxic emissions such as dioxins and furans.
• These pollutants are harmful to both humans and the environment.
• Sustainable Waste Management Practices:
• These practices focus on reducing waste generation, recycling, and adopting eco-friendly disposal methods.
• Advanced technologies such as chemical treatment and plasma arc gasification are gaining traction.
• Global Efforts to Reduce Waste Pollution:
• The United Nations Sustainable Development Goals (SDGs) emphasize responsible consumption and production to combat waste pollution.
• Countries worldwide are adopting stricter regulations and innovative solutions for waste management.

Q33. Answer: (b) 59/9

Given:

Recurring decimal: 6.555...

Formula used:

Let x = 6.555..., then multiply by the appropriate power of 10 to eliminate the repeating decimal.

Calculation:

Let x = 6.555...

=> 10x = 65.555...

=> 10x - x = 65.555... - 6.555...

=> 9x = 59

=> x = 59/9

Therefore The correct answer is option (2).

Q34. Answer: (b) The President appoints ambassadors and conducts diplomatic work in his/her name.

The correct answer is The President appoints ambassadors and conducts diplomatic work in his/her name..

Key Points

• The Indian President, as the head of state, exercises certain powers related to foreign affairs, including appointing ambassadors and conducting diplomatic actions in their name.
• All international treaties and agreements are signed in the name of the President, but they require ratification by Parliament to become binding.
• The President formally represents India in international forums and receives foreign ambassadors and dignitaries.
• While the President's role is largely ceremonial in foreign affairs, the Prime Minister and the Ministry of External Affairs handle the substantive and decision-making aspects.
• Constitutionally, the President acts on the advice of the Council of Ministers, led by the Prime Minister, in matters related to foreign policy.

Additional Information

• Ambassadors:
• Ambassadors are official representatives of a nation in foreign countries.
• They are appointed by the President of India based on recommendations from the Ministry of External Affairs.
• Ambassadors play key roles in promoting diplomatic relations, trade, and cultural exchanges.
• International Treaties:
• International treaties signed by the President must be approved by Parliament under Article 253 of the Constitution.
• Treaties cover a wide range of subjects, including trade, defense, and environmental agreements.
• Role of the Prime Minister:
• The Prime Minister leads foreign policy decision-making in consultation with the Cabinet.
• While the President represents India ceremonially, the Prime Minister negotiates and shapes international relations.
• Ministry of External Affairs:
• This ministry is responsible for India's foreign relations, trade agreements, and diplomatic missions.

• It coordinates closely with the President and Prime Minister to implement India's foreign policy.

Q35. Answer: (c) 1 and 3

The correct answer is Option 3.

Key Points

• NPS Vatsalya, launched in 2024, is a child-focused pension scheme overseen by the Pension Fund Regulatory and Development Authority (PFRDA).

• Under the scheme, children below 18 years of age can have individual accounts, allowing for targeted savings with flexible contributions.

• Subscribers are permitted a smooth transition to a regular NPS account upon reaching 18 years of age, ensuring continuity in retirement planning.

• Option 3 correctly highlights that the scheme is regulated by PFRDA and facilitates the seamless migration to a standard NPS account.

• Contrary to some options, the scheme does not mandate a switch to Atal Pension Yojana upon adulthood but ensures voluntary transitions based on subscriber needs.

Additional Information

• Pension Fund Regulatory and Development Authority (PFRDA):

• PFRDA is a statutory authority under the Indian government responsible for regulating and promoting pension schemes such as the National Pension System (NPS).

• It plays a crucial role in ensuring the financial security of citizens post-retirement.

• National Pension System (NPS):

• NPS is a government-backed voluntary retirement savings scheme open to all Indian citizens aged 18-70.

• Subscribers can contribute regularly to their accounts and receive market-linked returns.

• NPS is managed by PFRDA and offers tax benefits under Section 80CCD(1) and 80CCD(1B).

• Atal Pension Yojana (APY):

• APY is a government-backed pension scheme focused on unorganized sector workers.

• It provides guaranteed pension benefits ranging from Rs. 1,000 to Rs. 5,000 per month, depending on contributions.

• Eligible subscribers must be between 18-40 years of age.

• Child-Focused Financial Schemes:

• Such schemes aim to inculcate early financial discipline and savings habits among children.

• They often include features like flexible contributions, parental oversight, and benefits tailored to future needs.

Q36. Answer: (c) 10% loss

Shortcut Trick

Let the Cost Price (CP) be 100.

Marked Price (MP) = 100 × (120 ÷ 100) = 120.

Selling Price (SP) = 120 × (75 ÷ 100) = 90.

Net Profit or Loss = SP − CP = 90 − 100 = −10.

Successive percentage formula: a + b + (ab ÷ 100) => 20 − 25 + (20 × −25 ÷ 100) = −5 − 5 = −10%.

Therefore The correct answer is 10% loss.

Alternate Method

Given: Markup % = 20%, Discount % = 25%.

Formulas: MP = CP × (100 + Markup%) ÷ 100 | SP = MP × (100 − Discount%) ÷ 100 | Loss% = (CP − SP) ÷ CP × 100

=> Let Cost Price = 100 units.

=> Marked Price = 100 + (20% of 100) = 120 units.

=> Selling Price = 120 − (25% of 120) = 120 − 30 = 90 units.

=> Since SP < CP, there is a Loss.

=> Loss% = (100 − 90) ÷ 100 × 100 = 10%.

Therefore The correct answer is 10% loss.

Additional Information

Marked Price & Discount

The price at which a product is listed is the Marked Price (MP). Discount is always calculated on the MP. SP = MP − Discount.

Successive Percentage Change

When a value is changed by x% and then by y%, the net change is [x + y + (xy ÷ 100)]%. Here, markup is positive and discount is negative.

Q37. Answer: (d) Two

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

1) Only three people have exams after R.

2) T has the exam on Sunday.

3) P has the exam immediately after R, but before Q.

Weekday	Person
Monday	
Tuesday	
Wednesday	
Thursday	R
Friday	P
Saturday	Q
Sunday	T

4) S has the exam before U but after V.

Weekday	Person
Monday	V
Tuesday	S
Wednesday	U
Thursday	R
Friday	P
Saturday	Q
Sunday	T

Thus, there are 2 people who have exams between P and S.

Hence, the correct answer is "Option 4".

Q38. Answer: (a) 1

Given:

The number is 6427519.

Arranging the digits of the number 6427519 in ascending order from left to right:

Original Digit	6	4	2	7	5	1	9
Sorted Digit	1	2	4	5	6	7	9

Comparing the positions:

Only one digit (9) remains in the same position.

Hence, the correct answer is "Option 1".

Q39. Answer: (a) 2

Shortcut Trick

Let Sujatha's age be S and Vanita's age be V.

Equation 1: 5S − 2V = 5

Equation 2 (after 4 years): 5(S + 4) − 3(V + 4) = 8 => 5S − 3V = 0

From Eq 2: 5S = 3V. Substitute in Eq 1: 3V − 2V = 5 => V = 5.

Since 5S = 3(5), S = 3. Difference k = V − S = 5 − 3 = 2.

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Therefore The correct answer is 2 years.

Alternate Method

Given: Relation between present ages and ages after 4 years.

=> Let Sujatha's present age = S and Vanita's present age = V.

=> From the first condition: 5S = 2V + 5 — (i)

=> Age after 4 years: Sujatha = S + 4, Vanita = V + 4.

=> From the second condition: 3(V + 4) = 5(S + 4) − 8

=> 3V + 12 = 5S + 20 − 8

=> 3V + 12 = 5S + 12

=> 3V = 5S — (ii)

=> Substitute 5S = 3V from (ii) into (i):

=> 3V = 2V + 5

=> V = 5 years

=> Now, 5S = 3(5) => S = 3 years

=> Difference k = V − S = 5 − 3 = 2

Therefore The correct answer is 2 years.

Additional Information

Age Difference Property

The difference between the ages of two persons remains constant at any point in time.

Linear Equations in Two Variables

Problems involving two people and two conditions are best solved using substitution or elimination methods.

Ratio of Ages

If the ratio of ages is given, use a common multiplier 'x' to represent actual ages and solve the linear equation.

Q40. Answer: (d) 1:00 PM

The correct answer is 1:00 PM.

Key Points

• The Indian Standard Time (IST) is based on the longitude of 82º30′E, which is 5 hours 30 minutes ahead of GMT (Greenwich Mean Time).

• Each degree of longitude corresponds to a time difference of 4 minutes. Moving eastward adds time, while moving westward subtracts time.

• The difference in longitude between 82º30′E (IST) and 97º30′E is 15 degrees.

• 15 degrees corresponds to a time difference of 15 × 4 = 60 minutes (1 hour).

• Therefore, if it is 12 noon at 82º30′E (IST), the time at 97º30′E will be 1:00 PM.

Additional Information

• Longitude and Time Relationship

• The Earth is divided into 360 degrees of longitude, and the rotation of the Earth takes 24 hours, meaning 15 degrees per hour.

• Each degree of longitude represents a time difference of 4 minutes (60 minutes ÷ 15 degrees).

• Standard Meridian

• Standard time is calculated based on a specific longitude called the standard meridian of a region.

• India’s standard meridian is 82º30′E, which passes near Mirzapur in Uttar Pradesh.

• Time Zones

• Time zones are regions on Earth with the same standard time, usually spaced at 15-degree intervals of longitude.

• Countries like India use a single time zone for the entire country, while others like the USA use multiple time zones.

• Eastward vs Westward Time Calculation

• When moving eastward, time is added to the standard time of the reference meridian.

• When moving westward, time is subtracted from the standard time of the reference meridian.

Q41. Answer: (b) migration from rural areas

The correct answer is migration from rural areas.

Key Points

• Class I cities in India are defined as cities with a population of 100,000 or more, which experience rapid urbanization and demographic shifts.

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• Migration from rural areas is the primary factor influencing population growth in these cities due to better job opportunities, access to education, and healthcare services.

• Rural-to-urban migration is driven by the lack of livelihood options and infrastructure in rural areas, often referred to as "push factors."

• "Pull factors" like industrialization, urban amenities, and higher wages in cities attract large numbers of people from rural regions.

• According to Census data and research, migration contributes significantly to urban population growth, especially in economically dynamic cities like Delhi, Mumbai, and Bengaluru.

Additional Information

• Urbanization:

• Urbanization refers to the increase in the proportion of a population living in urban areas and cities.

• In India, urbanization has been growing steadily due to economic growth and migration from rural areas.

• Class I cities house a significant portion of India’s urban population, becoming hubs of economic activity.

• Push and Pull Factors:

• "Push factors" include poverty, unemployment, inadequate healthcare, and lack of education opportunities in rural areas.

• "Pull factors" include better living standards, employment opportunities, and urban amenities like schools and hospitals.

• Government Policies for Urban Development:

• Programs like Smart Cities Mission and AMRUT aim to improve infrastructure and sustainability in urban areas.

• Policies addressing rural development may reduce migration by improving living conditions in rural areas.

• Challenges of Rapid Urbanization:

• Overcrowding, traffic congestion, pollution, and strain on housing and infrastructure are common issues.

• Urban planning and sustainable development are crucial to addressing these challenges effectively.

Q42. Answer: (b) To view how the sheet will look when printed

The correct answer is To view how the sheet will look when printed.

Key Points

• The 'Print Preview' feature in MS Excel 2019 allows users to see exactly how their spreadsheet will appear when printed, ensuring proper layout and formatting.

• It is accessed through the File tab → Print or by using the shortcut Ctrl + P.

• The feature provides options to adjust settings such as page orientation, margins, scaling, and paper size directly from the preview window.

• Users can check for errors like truncated columns, misaligned rows, or missing data before printing.

• It helps save paper and ink by avoiding unnecessary printing of incorrectly formatted sheets.

Additional Information

• Page Layout:

• The 'Page Layout' tab in MS Excel provides options to adjust page settings, including margins, orientation, and scaling.

• These settings directly impact how the content appears in the 'Print Preview' window.

• Scaling Options:

• Users can fit the spreadsheet to one page or multiple pages using scaling options in the 'Print Preview' screen.

• This ensures that large datasets are printed in an organized and readable format.

• Headers and Footers:

• The 'Print Preview' feature allows users to view headers and footers before printing, ensuring that important information like page numbers or titles is included.

• Print Settings:

• In the 'Print Preview' window, users can customize settings such as the number of copies, printer selection, and page range to print.

• Shortcut for Quick Access:

• The keyboard shortcut Ctrl + P opens the print preview directly, speeding up the printing process.

Q43. Answer: (d) 64

Shortcut Trick

Fourth Proportion to 9, 3, 27 => (3 × 27) ÷ 9 = 9.

Third Proportion to A and 24 => (24 × 24) ÷ A.

According to the question: 9 = 576 ÷ A.

=> A = 576 ÷ 9 = 64.

Therefore The correct answer is 64.

Alternate Method

Given: Numbers for Fourth Proportion are 9, 3, 27 and numbers for Third Proportion are A, 24.

Formula Used: Fourth proportion of a, b, c = (b × c) ÷ a; Third proportion of a, b = b^2 ÷ a.

=> Fourth Proportion = (3 × 27) ÷ 9

=> Fourth Proportion = 81 ÷ 9 = 9

=> Third Proportion = 24^2 ÷ A = 576 ÷ A

=> 9 = 576 ÷ A

=> A = 576 ÷ 9

=> A = 64

Therefore The correct answer is 64.

Additional Information

Mean Proportion

The mean proportion between two numbers a and b is calculated as √(a × b).

Continued Proportion

Three numbers a, b, c are in continued proportion if a : b = b : c, which implies b^2 = ac.

Ratio & Proportion Basics

In a proportion a : b :: c : d, the product of extremes is equal to the product of means: a × d = b × c.

Q44. Answer: (b) At least twice in a year

The correct answer is At least twice in a year.

Key Points

• According to the 73rd Constitutional Amendment Act, 1992, the Gram Sabha is the cornerstone of the Panchayati Raj system in India.

• As per its provisions, the members of the Gram Sabha are required to meet at least twice every year.

• The meetings of the Gram Sabha are generally convened to discuss and approve important decisions related to local governance, development works, and financial planning.

• The quorum for the Gram Sabha meetings is usually specified by respective state laws, ensuring adequate representation of villagers in the decision-making process.

• The regularity of these meetings ensures transparency, accountability, and grassroots participation in governance.

Additional Information

• 73rd Constitutional Amendment Act, 1992

• This amendment provided a constitutional status to Panchayati Raj institutions and aimed to strengthen grassroots democracy in India.

• It added Part IX to the Constitution, titled "The Panchayats," and included provisions from Articles 243 to 243O.

• The act introduced the concept of Gram Sabha as the foundation of the Panchayati Raj system.

• Gram Sabha

• The Gram Sabha consists of all adult members (18 years and above) of a village or a cluster of villages within a Panchayat jurisdiction.

• It serves as a democratic platform for villagers to participate directly in decision-making processes.

• Key functions include discussing developmental projects, approving budgets, and scrutinizing the work of the Panchayat.

• Importance of Regular Meetings

• Regular meetings ensure better monitoring of development programs and the utilization of funds.

• They promote transparency and accountability by providing a forum for feedback and suggestions from villagers.

• These meetings also address issues related to governance, social welfare, and public grievances.

• Panchayati Raj System

• The Panchayati Raj system operates on three levels: village (Gram Panchayat), block (Panchayat Samiti), and district (Zila Parishad).

• It aims to decentralize governance and bring decision-making closer to the people.

• Each state has its own Panchayati Raj Act to govern the structure and functioning of the system within its jurisdiction.

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Q45. Answer: (a) Lord Dufferin

The correct answer is Lord Dufferin.

Key Points

• Lord Dufferin served as the Viceroy of India from 1884 to 1888.

• He described the Indian National Congress as representing only a "microscopic minority" of the Indian population during its early years.

• This statement was made in the context of Congress's first session held in 1885, which was attended by a limited number of elite Indians.

• Lord Dufferin's dismissal of Congress indicated the British administration's reluctance to acknowledge its political relevance at that time.

• His remarks reflected the colonial mindset that underestimated the growing political aspirations of Indians and paved the way for future nationalist movements.

Additional Information

• Indian National Congress:

• Founded in 1885 by A.O. Hume, Dadabhai Naoroji, and others, initially aimed at creating a platform for civic and political dialogue among educated Indians.

• Its first session was held in Bombay (now Mumbai) with 72 delegates.

• It played a pivotal role in India's freedom struggle and evolved into a mass movement in later years.

• Lord Dufferin's Era:

• His tenure witnessed the establishment of the Indian National Congress.

• He introduced reforms in education and public works, but his policies largely aimed at consolidating British authority in India.

• Colonial Mindset:

• The British often dismissed Indian aspirations for self-rule as premature and irrelevant.

• Statements like "microscopic minority" reflected the paternalistic attitude of the British administration towards Indian leaders.

• Congress's Growth:

• Despite early dismissals, the Congress steadily grew into a powerful political organization representing diverse sections of Indian society.

• By the early 20th century, it became the driving force behind India's independence movement.

Q46. Answer: (b) 4 km to the North

Given:

Mr. Evan starts from Point A and drives 8 km towards the East. He then takes a right turn, drives 19 km, turns right and drives 19 km.

He then takes a right turn and drives 9 km. He then taken a right turn, drives 3 km, turns left and drives 6 km.

He takes a final right turn, drives 8 km and stops at Point P.

Thus, Evan has to drive 4 km north to reach point A.

Hence, the correct answer is "Option 2".

Q47. Answer: (a) Intelligence: Natural. Artificial. Collective

The correct answer is Intelligence: Natural. Artificial. Collective.

Key Points

• The Venice Architecture Biennale 2025 has been themed "Intelligence: Natural. Artificial. Collective", emphasizing the interplay between natural and artificial intelligence and collective human ingenuity.

• The theme aims to explore how advancements in AI, machine learning, and natural intelligence can influence architectural practices and urban planning.

• The Biennale will focus on fostering dialogues around the balance between technology and nature, highlighting sustainable and intelligent design solutions.

• Curators and architects worldwide will contribute innovative ideas and projects under this theme to address the future of architecture and its role in shaping societies.

• The event is scheduled to take place from May to November 2025, continuing its tradition as a platform for critical architectural discussions.

Additional Information

• Venice Architecture Biennale:

• It is one of the most prestigious international architecture exhibitions, held biennially in Venice, Italy.

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• The event serves as a global platform for architects, designers, and scholars to showcase innovative ideas and research.
• Each edition features a unique theme that addresses critical issues in architecture, urbanism, and societal development.
• Artificial Intelligence in Architecture:
• AI tools like generative design and machine learning are increasingly used to optimize building designs and urban planning.
• AI helps architects create more sustainable, energy-efficient, and adaptive structures tailored to user needs.
• Natural Intelligence:
• Refers to the cognitive abilities of humans and their capacity to innovate and adapt.
• In architecture, natural intelligence emphasizes human-centric designs and sustainable practices inspired by nature.
• Collective Intelligence:
• Describes the shared knowledge and creativity arising from collaboration among individuals or groups.
• In the context of architecture, it highlights interdisciplinary approaches and community-driven solutions.

Q48. Answer: (c) 2

The given code language is:

Thus, 'D' is coded as '2'.

Hence, the correct answer is "Option 3".

Q49. Answer: (c) Reuters

The correct answer is Reuters.

Key Points

• The Pulitzer-winning investigative series titled 'Fentanyl Express' was produced by the global news organization Reuters.
• The series explored the dangerous and growing opioid epidemic fueled by synthetic drugs like fentanyl, which are increasingly used in the United States.
• It provided an in-depth analysis of the cross-border trafficking routes, particularly from Mexico to the U.S., that contribute to the fentanyl crisis.
• The reporting highlighted the devastating impact of fentanyl addiction on individuals and communities while exposing the challenges faced by law enforcement agencies.
• Reuters' investigative journalism in this series played a pivotal role in raising awareness about the fentanyl epidemic and its societal implications.

Additional Information

• Fentanyl:
• Fentanyl is a synthetic opioid that is 50-100 times more potent than morphine.
• It is used medically for pain relief but is often illegally manufactured and distributed as a recreational drug.
• Because of its high potency, even a small amount can lead to overdose and death.
• Opioid Epidemic:
• The opioid epidemic refers to the widespread misuse of opioids, including prescription pain relievers, heroin, and synthetic opioids like fentanyl.
• It has led to significant increases in addiction, overdose deaths, and societal costs globally, especially in the U.S.
• Pulitzer Prize for Investigative Reporting:
• The Pulitzer Prize for Investigative Reporting is awarded for outstanding journalism that uncovers major issues or injustices.
• It recognizes efforts that lead to public awareness and policy changes.
• Cross-Border Drug Trafficking:
• Cross-border drug trafficking is a major issue contributing to the global drug crisis, including fentanyl distribution.
• It often involves organized crime syndicates and poses challenges for international law enforcement agencies.

Q50. Answer: (c) V Narayanan

The correct answer is V Narayanan.

Key Points

• V Narayanan was appointed as the Chairman of the Indian Space Research Organisation (ISRO) in January 2025.
• He is a distinguished scientist with expertise in rocket propulsion and held the position of Director of the Liquid Propulsion Systems Centre (LPSC) prior to his appointment.
• V Narayanan has contributed significantly to the development of advanced cryogenic and semi-cryogenic propulsion systems for ISRO’s launch vehicles.
• Under his leadership, ISRO aims to further its advancements in space exploration, satellite technologies, and interplanetary

missions.

• His appointment comes at a time when ISRO is focusing on critical projects like Gaganyaan (India's human spaceflight mission) and deep-space exploration initiatives.

Additional Information

• Indian Space Research Organisation (ISRO):

• Founded in 1969, ISRO is India's national space agency headquartered in Bengaluru, Karnataka.

• ISRO is known for significant missions such as Chandrayaan (moon exploration), Mangalyaan (Mars Orbiter Mission), and satellite launches like GSAT, RISAT, and NAVIC series.

• It operates under the Department of Space, which is directly overseen by the Prime Minister of India.

• Liquid Propulsion Systems Centre (LPSC):

• LPSC is a key facility of ISRO specializing in the research, development, and production of liquid propulsion systems for launch vehicles and spacecraft.

• It has facilities in Valiamala (Kerala), Bengaluru (Karnataka), and Mahendragiri (Tamil Nadu).

• Gaganyaan Mission:

• Gaganyaan is India's ambitious human spaceflight program aiming to send astronauts to low Earth orbit.

• The mission is expected to use the GSLV Mk III rocket and will include several preparatory unmanned missions.

• Cryogenic Propulsion Systems:

• Cryogenic propulsion involves the use of propellants stored at extremely low temperatures, such as liquid hydrogen and liquid oxygen.

• These systems are crucial for heavy-lift launch vehicles and interplanetary missions.

Q51. Answer: (c) KMG

The logic followed here is:

Option (1): IKF

Option (2): GID

Option (3): KMG

Option (4): MOJ

The letter-cluster that DOES NOT belong to the group is: KMG.

Hence, the correct answer is "Option (3)"

Q52. Answer: (a) 0

Shortcut Trick

Identify complementary angles: (35° + 55° = 90°), (11° + 79° = 90°), and (27° + 63° = 90°).

Apply the property: If A + B = 90°, then sin A / cos B = 1 and cos A / sin B = 1.

Also, cos A × cosec B = 1 if A + B = 90°.

Expression becomes: 1 + 1 − 2(1) = 0.

Therefore The correct answer is 0.

Alternate Method

Given: cos 35°/sin 55° + sin 11°/cos 79° − 2 cos 27° cosec 63°

Formula Used: sin(90° − θ) = cos θ | cos(90° − θ) = sin θ | cosec(90° − θ) = sec θ

=> cos 35° = cos(90° − 55°) = sin 55°

=> sin 11° = sin(90° − 79°) = cos 79°

=> cosec 63° = cosec(90° − 27°) = sec 27°

=> Expression = (sin 55° / sin 55°) + (cos 79° / cos 79°) − 2 × cos 27° × sec 27°

=> Since cos θ × sec θ = 1, the term 2 × cos 27° × sec 27° = 2 × 1

=> Expression = 1 + 1 − 2 = 0

Therefore The correct answer is 0.

Additional Information

Complementary Angle Identities

Trigonometric ratios of complementary angles: sin(90° − θ) = cos θ, tan(90° − θ) = cot θ, and sec(90° − θ) = cosec θ.

Reciprocal Identities

Standard reciprocal pairs include sin θ × cosec θ = 1, cos θ × sec θ = 1, and tan θ × cot θ = 1.

Product Property for Complementary Angles

If A + B = 90°, then tan A × tan B = 1 and cot A × cot B = 1.

Q53. Answer: (a) Rajasthan

The correct answer is Rajasthan.

Key Points

• Desert soil is predominantly found in Rajasthan, which houses the majority of the Thar Desert, also known as the Great Indian Desert.

• Rajasthan's desert soil is characterized by low organic matter, sandy texture, and poor water retention capacity.

• Such soil is typically formed due to arid climatic conditions and lacks sufficient vegetation cover.

• The western parts of Rajasthan, including districts like Jaisalmer, Barmer, and Bikaner, are most affected by desertification and have extensive coverage of desert soil.

• Desert soil is primarily used for growing drought-resistant crops like millets, pulses, and mustard.

Additional Information

• Thar Desert:

• Located in northwest India, the Thar Desert is the world's 17th largest desert and covers about 200,000 square kilometers.

• It spans across Rajasthan and extends into parts of Gujarat, Punjab, and Haryana.

• The Thar Desert plays a crucial role in shaping the soil composition of western Rajasthan.

• Desertification:

• Desertification refers to the process by which fertile land becomes desert, typically due to drought, deforestation, or inappropriate agricultural practices.

• Rajasthan is one of the Indian states most affected by desertification.

• Government initiatives like the Desert Development Programme aim to counter desertification in the region.

• Soil Composition in Rajasthan:

• In addition to desert soil, Rajasthan also has alluvial soil in regions near rivers like Chambal and black soil in parts of the southeastern region.

• Desert soil lacks essential nutrients like nitrogen and phosphorus, which are critical for high agricultural yield.

• Climate of Rajasthan:

• Rajasthan has a predominantly arid and semi-arid climate, with temperatures ranging from extreme heat in summers to extreme cold in winters.

• Annual rainfall in desert regions of Rajasthan is generally less than 150 mm, contributing to the formation of desert soil.

Q54. Answer: (a) Pastes content without any formatting

The correct answer is Pastes content without any formatting.

Key Points

• Ctrl + Shift + V is a keyboard shortcut used in certain applications like Google Docs and web browsers.

• This command allows users to paste text without retaining any formatting, ensuring the pasted content adopts the styling of the current document or editor.

• It is particularly helpful when copying text from external sources with unwanted styles, such as bold, italic, or colors.

• Unlike Ctrl + V, which pastes text along with its original formatting, Ctrl + Shift + V simplifies the workflow for creating uniform documents.

• This functionality is widely supported across multiple platforms, including Google Docs, Gmail, and some text editors.

Additional Information

• Keyboard Shortcuts:

• Keyboard shortcuts are combinations of keys that provide quick access to specific functions, enhancing productivity.

• Examples include Ctrl + C for copying, Ctrl + X for cutting, and Ctrl + V for pasting.

• Shortcuts vary between applications and operating systems, but many are standardized across platforms.

• Text Formatting:

• Formatting refers to the appearance of text, including font style, size, color, alignment, and spacing.

• Removing formatting ensures consistency in documents, which is crucial for professional and academic writing.

• Rich Text vs Plain Text:

• Rich text includes formatting such as bold, italic, fonts, and colors, while plain text contains only unformatted characters.

• Ctrl + Shift + V pastes text as plain text, discarding rich text formatting.

• Application-Specific Behavior:

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• Not all applications support Ctrl + Shift + V; its behavior might vary depending on the software.
• Some programs may have alternative shortcuts or require manual selection of "Paste as Plain Text" from menus.

Q55. Answer: (b) 9

The given code language is:
Thus, 'A' is coded as '9'.
Hence, the correct answer is "Option 2".

Q56. Answer: (a) 3234

Given:
[(22 × 6) × {8 ÷ 4 × (15 - 11/4)}]
Formula used:
Order of operations: Brackets → Division/Multiplication → Addition/Subtraction
Calculation:
[(22 × 6) × {8 ÷ 4 × (15 - 11/4)}]
=> [(22 × 6) × {8 ÷ 4 × (15 - 2.75)}]
=> [(22 × 6) × {8 ÷ 4 × 12.25}]
=> [(22 × 6) × {2 × 12.25}]
=> [(22 × 6) × 24.5]
=> [132 × 24.5]
=> [3234]
Therefore The correct answer is option (1).

Q57. Answer: (b) Only Conclusion (II) follows

The least possible venn diagram is:
Conclusion:
(I) Some langurs are gorillas → False (As, No monkey is a langur. so, Some langurs are gorillas cannot be true)
(II) Some monkeys are chimpanzees → True (As, All chimpanzees are gorilla, All gorillas are monkeys. so, Some monkeys are chimpanzees holds true).
Thus, Only Conclusion (II) follows.
Hence, the correct answer is "Option 2".

Q58. Answer: (a) Fearless

The correct answer is Fearless.
Key Points
• Fearless is the title of Lauren Roberts' novel, the third installment in 'The Powerless' trilogy.
• Lauren Roberts is known for her captivating storytelling and immersive fantasy worlds.
• 'The Powerless' trilogy explores themes of courage, resilience, and the fight against oppression.
• The third novel, Fearless, continues to build upon the narrative established in previous books, providing a gripping conclusion to the trilogy.
• The trilogy has been well-received by readers for its compelling characters and intricate plotlines.
Additional Information
• Lauren Roberts
• Lauren Roberts is an author known for her expertise in young adult and fantasy genres.
• Her works often feature themes of empowerment, personal growth, and overcoming adversity.
• She has garnered a loyal fan base for her engaging writing style and memorable characters.
• 'The Powerless' Trilogy
• This trilogy comprises three novels: Powerless, Endless, and Fearless.
• The series follows the protagonist's journey in a dystopian world where power dynamics and moral dilemmas play a central role.
• It is celebrated for its blend of action, romance, and thought-provoking themes.
• Fantasy Genre
• Fantasy novels are characterized by their use of magical elements and fictional worlds.
• This genre often delves into universal themes like good vs. evil, heroism, and self-discovery.

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• Authors like Lauren Roberts use the fantasy genre to create allegorical narratives that resonate with readers.
• Impact on Readers
• The trilogy has been praised for its ability to inspire readers to confront challenges fearlessly.
• Fans of 'The Powerless' trilogy often highlight its emotional depth and thought-provoking social commentary.

Q59. Answer: (a) 3 - 5 - 7 - 11

The logic followed here is:
First number + 2 = Second number:
Second number + 2 = Third number:
Third number + 4 = Fourth number:
For, 12 - 14 - 16 - 20
=> 12 + 2 = 14
=> 14 + 2 = 16
=> 16 + 4 = 20
Here, the logic followed.
For, 14 - 16 - 18 - 22
=> 14 + 2 = 16
=> 16 + 2 = 18
=> 18 + 4 = 22
Here, the logic followed.
Option 1) 3 - 5 - 7 - 11
=> 3 + 2 = 5 (Matches)
=> 5 + 2 = 7 (Matches)
=> 7 + 4 = 11 (Matches)
Here, logic followed.
Option 2) 19 - 20 - 22 - 44
=> 19 + 2 = 21 (Given Second number is 20, 20 ≠ 21)
Here, logic not followed.
Option 3) 4 - 8 - 16 - 32
=> This is a multiplication series (×2) and does not follow the required logic.
Here, logic not followed.
Option 4) 13 - 15 - 17 - 32
=> 13 + 2 = 15 (Matches)
=> 15 + 2 = 17 (Matches)
=> 17 + 4 = 21 (Given Fourth number is 32, 32 ≠ 21)
Here, logic not followed.
Hence, the correct answer is "Option 1".

Q60. Answer: (b) Smriti Mandhana

The correct answer is Smriti Mandhana.
Key Points
• Smriti Mandhana, the Indian women's cricket team opener, was awarded the prestigious Polly Umrigar Award by the Board of Control for Cricket in India (BCCI) in January 2025.
• This award is given to recognize outstanding performances in international cricket during a particular season.
• Smriti Mandhana has been a consistent performer for India, excelling in all formats of the game and significantly contributing to the team's success.
• The Polly Umrigar Award is one of the most prestigious accolades in Indian cricket, named after former Indian cricketer Polly Umrigar, who was one of India's early cricketing stalwarts.
• Smriti Mandhana has previously won similar accolades, including the ICC Women's Cricketer of the Year and ICC ODI Player of the Year awards, showcasing her exceptional talent and consistency on the global stage.
Additional Information
• Polly Umrigar Award:
• It is presented annually by the BCCI to the best Indian international cricketer (male or female).

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• The award is named after Polly Umrigar, a legendary Indian cricketer who played for India between 1948 and 1962.
• The winner receives a trophy and a monetary reward.
• Smriti Mandhana's Achievements:
• She was the youngest T20I captain for India when she led the team in 2019.
• Mandhana is the first Indian woman cricketer to score a double century in a one-day game (2013).
• She has been a key player in the Indian Premier League for Women and in international leagues such as the Women's Big Bash League (WBBL).
• BCCI Women's Awards:
• The BCCI has been actively recognizing the contributions of women cricketers through various awards.
• These awards aim to highlight the growing prominence of women's cricket in India and inspire future players.
• Growth of Women's Cricket in India:
• The Indian women's cricket team has witnessed significant growth in popularity, especially after reaching the ICC Women's World Cup final in 2017.
• Initiatives like the Women's IPL have further elevated the status of women's cricket in India.
• The performances of players like Smriti Mandhana, Harmanpreet Kaur, and Shafali Verma have played a pivotal role in this transformation.

Q61. Answer: (b) Rs. 10 lakh crore

The correct answer is Rs. 10 lakh crore.

Key Points

• For the financial year 2023-24, the Indian government allocated a record Rs. 10 lakh crore for infrastructure development, marking a significant 33% increase from the previous year's allocation.
• This allocation represents approximately 3.3% of the GDP, showcasing the government’s commitment to enhancing infrastructure.
• The budget prioritizes the development of roads, railways, airports, and logistics infrastructure to boost connectivity and economic growth.
• The government has emphasized funding through capital expenditure, which is crucial for long-term growth and job creation.
• The enhanced infrastructure budget aligns with India’s vision of becoming a $5 trillion economy and focuses on sustainable and inclusive development.

Additional Information

• Capital Expenditure
• Capital expenditure involves spending on assets like infrastructure, machinery, and buildings that contribute to long-term economic growth.
• Such investments play a vital role in enhancing productivity, connectivity, and employment opportunities.
• Infrastructure Development in India
• India's focus on infrastructure includes sectors like roads, railways, ports, energy, and urban development.
• Initiatives like Bharatmala Pariyojana and Sagar Mala aim to improve transportation and logistics efficiency.
• Budgetary Focus on Green Growth
• The 2023-24 budget also emphasizes sustainable growth by allocating funds for renewable energy projects and green infrastructure.
• Programs like the National Green Hydrogen Mission are part of this strategy.
• Multiplier Effect of Infrastructure Investment
• Infrastructure spending creates a multiplier effect by stimulating demand in related industries like steel, cement, and construction.
• It also contributes to job creation and boosts overall economic activity.

Q62. Answer: (b) 15

Shortcut Trick

Total Work (LCM of 12, 18) = 36 units.

Efficiency: A = 3, B = 2.

Combined work for 2 days = (3 + 2) × 2 = 10 units.

Remaining work = 36 − 10 = 26 units.

Time taken by B for remaining work = 26 ÷ 2 = 13 days.

Total time = 2 + 13 = 15 days.

Therefore The correct answer is 15 days.

Alternate Method

Given: Time taken by A = 12 days, Time taken by B = 18 days. Both work for 2 days.

Person	Days	Total Work	Efficiency
A	12	36	3
B	18	2	

=> Total Work = LCM(12, 18) = 36 units

=> Efficiency of A = 36 ÷ 12 = 3 units/day

=> Efficiency of B = 36 ÷ 18 = 2 units/day

=> Work done by A and B in 2 days = (3 + 2) × 2 = 10 units

=> Remaining Work = 36 − 10 = 26 units

=> Time taken by B alone to finish remaining work = 26 ÷ 2 = 13 days

=> Total time taken to complete the work = 2 + 13 = 15 days

Therefore The correct answer is 15 days.

Additional Information

Total Work Concept

Total work is usually considered as the LCM of the time taken by individuals to simplify efficiency calculations.

Work and Efficiency Relation

Efficiency is inversely proportional to the time taken. Efficiency = Total Work ÷ Time.

Leaving Work Logic

If a person leaves, subtract the work done before leaving from the total work and divide the remaining work by the efficiency of the remaining person.

Q63. Answer: (d) 61

Shortcut Trick

Total number of observations (n) = 11 (which is odd).

Arrange the data in ascending order: 17, 30, 38, 48, 59, 61, 67, 80, 80, 88, 91.

Median = ((n + 1) ÷ 2)^(th) term = ((11 + 1) ÷ 2)^(th) term = 6^(th) term.

The 6^(th) term in the sorted list is 61.

Therefore The correct answer is 61.

Alternate Method

Given: Observations = 59, 67, 17, 38, 88, 61, 80, 91, 30, 48, 80

Formula Used: Median = ((n + 1) ÷ 2)^(th) term (when n is odd)

17

30

38

48

59

61

Median

67

80

80

Q64. Answer: (a) WIfe's mother's father

A is				
Symbol	•	–	x	÷
Meaning	Mother	Brother	Wife	Father
of B				

Given Expression: P ÷ Q + R – S x T

P ÷ Q: P is the father of Q.

Q + R: Q is the mother of R.

R – S: R is the brother of S.

S x T: S is the wife of T.

According to the given information Family Tree Representation:

Therefore, P is the Wife's mother's father of T.

Hence, the correct answer is "Option 1"

Q65. Answer: (c) Length over time

The correct answer is Length over time.

Key Points

• The speed limit on a highway is a measure of velocity or speed, which is defined as the rate of change of position with time.

• The dimensional formula for speed is Length/Time, represented as [L T^-¹] in terms of fundamental physical quantities.

• Speed is a scalar quantity, meaning it has magnitude but no direction, unlike velocity, which is a vector.

• In the context of highways, speed limits are usually expressed in units such as kilometers per hour (km/h) or miles per hour (mph), both of which align with the dimension of length over time.

• The correct dimensional understanding of speed is essential for applications in traffic regulations, transportation engineering, and physics.

Additional Information

• Speed vs Velocity:

• Speed is a scalar quantity, while velocity is a vector quantity (includes both magnitude and direction).

• Both have the same dimensional formula [L T^-¹], but velocity accounts for direction.

• Common Units of Speed:

• SI Unit: meters per second (m/s).

• Other Units: kilometers per hour (km/h), miles per hour (mph), or knots (used in aviation and maritime).

• Dimensional Analysis:

• Dimensional analysis helps verify equations or convert units by ensuring consistent dimensions across physical quantities.

• For speed, the dimension is derived from distance (length) divided by time.

• Practical Applications of Speed:

• Used in transportation to set speed limits for safety and efficiency.

• Plays a critical role in physics, engineering, and sports science.

Q66. Answer: (c) 58.4%

The correct answer is 0.584.

Key Points

• As per the Economic Survey Report 2024-25, 58.4% of India's workforce in 2023-24 was self-employed, showcasing a significant shift towards entrepreneurial ventures.

• This growing trend highlights the increasing reliance on self-employment as a primary source of livelihood for millions across India.

• Self-employment has been a dominant form of employment in rural areas, driven by agricultural activities and small-scale enterprises.

• The report also indicates a rise in self-employment in urban areas, attributed to the expansion of gig economy platforms and freelance opportunities.

• The surge in self-employment reflects the effectiveness of government initiatives like Skill India, Start-Up India, and Mudra Yojana in promoting entrepreneurship.

Additional Information

• Self-employment:

• Refers to individuals working for themselves rather than being employed by a company or organization.

• Common examples include entrepreneurs, freelancers, small business owners, and independent contractors.

• It provides flexibility in work schedules but often comes with challenges like income variability and lack of social security benefits.

• Economic Survey Report:

• An annual document presented by the Ministry of Finance, Government of India.

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• Provides detailed analysis of the country's economic performance and key trends over the past year.
• Serves as a crucial input for formulating policies and budgetary allocations.
• Entrepreneurship Trends in India:
• India has seen a rapid rise in entrepreneurship due to digital penetration and government support.
• Initiatives like Start-Up India and Mudra Yojana aim to provide financial and infrastructural support to budding entrepreneurs.
• The gig economy has further empowered individuals to monetize their skills independently.
• Government Schemes Promoting Self-Employment:
• Pradhan Mantri Mudra Yojana: Provides financial assistance to micro and small enterprises.
• Skill India: Focuses on skill development to enhance employability.
• Start-Up India: Encourages innovation and provides funding support to start-ups.

Q67. Answer: (a) 73%

Shortcut Trick
Direct Comparison: 87% marks = 696 marks
Required % for Sudha = (87 ÷ 696) × 584
Required % = 0.125 × 584 = 73%
Therefore The correct answer is 73%.
Alternate Method
Given:
Marks obtained by Kalpana = 696
Percentage obtained by Kalpana = 87%
Marks obtained by Sudha = 584
Formula Used:
Total Marks = (Obtained Marks ÷ Percentage) × 100
Percentage = (Obtained Marks ÷ Total Marks) × 100
Calculations:
=> Let total marks be T.
=> 87% of T = 696
=> T = (696 × 100) ÷ 87
=> T = 8 × 100 = 800
=> Sudha's Percentage = (584 ÷ 800) × 100
=> Sudha's Percentage = 584 ÷ 8 = 73%
Therefore The correct answer is 73%.
Additional Information
Percentage Change
Percentage change = (New value − Old value) ÷ Old value × 100.
Base Change Property
If A is x% more than B, then B is [x ÷ (100 + x)] × 100% less than A.
Unitary Method in Percentages
If x% corresponds to a value V, then 1% corresponds to V/x and 100% corresponds to (V/x) × 100.

Q68. Answer: (b) 2

Given series:
(Left) * # 8 # 5 # 3 3 € 6 7 & # 3 $ € @ 9 # 7 £ 9 (Right)
Condition to be checked:
Number → Symbol → Symbol
• # 8 # 5 # 3 3 € 6 7 & # 3 $ € @ 9 # 7 £ 9
There are two such symbols in the above arrangement (7 & #, 3 $ €).
Hence, the correct answer is "Option 2".

Q69. Answer: (d) Operational inefficiencies, low productivity, and financial losses

The correct answer is Operational inefficiencies, low productivity, and financial losses.
Key Points

• By the 1970s, Public Sector Units (PSUs) in India had grown significantly, controlling key industries such as steel, coal, and heavy machinery.

• PSUs were frequently criticized for operational inefficiencies, which included excessive red tape, bureaucratic delays, and outdated technologies.

• Low productivity plagued many PSUs, as they often operated without stringent performance benchmarks and faced issues with workforce management.

• Financial losses became a recurring problem due to mismanagement, overstaffing, and a lack of focus on profitability.

• The dominance of PSUs also stifled competition, leading to monopolistic practices that further worsened efficiency and innovation in the industry.

Additional Information

• Public Sector Units (PSUs):

• PSUs are government-owned corporations created to undertake commercial activities on behalf of the government.

• They played a key role in India's planned economy post-independence, focusing on industrial development and self-reliance.

• Examples include Steel Authority of India (SAIL), Bharat Heavy Electricals Limited (BHEL), and Indian Oil Corporation (IOC).

• License Raj:

• The License Raj was a system of elaborate licenses and regulations that governed the Indian economy from 1947 to 1991.

• This system restricted private sector growth and granted PSUs a dominant role in the economy.

• Economic Reforms of 1991:

• To address inefficiencies in the public sector, India initiated liberalization, privatization, and globalization (LPG) reforms.

• These reforms reduced the role of PSUs by encouraging private sector participation and reducing regulatory hurdles.

• Disinvestment in PSUs:

• Disinvestment refers to the process of selling or liquidating government-owned assets in PSUs.

• It was introduced to improve efficiency, reduce fiscal burden, and foster competition.

Q70. Answer: (b) Four

Given:

A, B, C, D, E, F, and G are sitting around a circular table facing the centre.

E sits third to the left of D.

B sits to the immediate left of D.

Only C sits between A and E.

G is not an immediate neighbour of E.

Thus, 4 people sit between C and G when counted from the right of C.

Hence, the correct answer is "Option 2".

Q71. Answer: (a) Ghana Vadya

The correct answer is Ghana Vadya.

Key Points

• Ghana Vadya refers to a category of musical instruments that produce sound through solid, non-stretched materials.

• These instruments are idiophones, meaning they generate sound by vibrating as a whole.

• Examples include cymbals, gongs, bells, and rattles, which were often derived from objects of utility in daily life.

• In traditional Indian music, Ghana Vadya instruments were used for rhythm and also served ceremonial and utilitarian purposes.

• The simplicity of these instruments made them accessible and integral to both folk and classical music traditions.

Additional Information

• Categories of Indian Musical Instruments:

• Ghana Vadya: Idiophones producing sound by the vibration of the instrument itself.

• Sushira Vadya: Wind instruments like flutes and shehnai, producing sound through air vibration.

• Tata Vadya: String instruments like sitar and veena, where sound is produced by vibrating strings.

• Avanaddh Vadya: Percussion instruments with stretched membranes, like tabla and mridangam.

• Idiophones: A class of musical instruments where sound is produced by the material of the instrument itself without strings or membranes.

• Utility in Daily Life: Many Ghana Vadya instruments originated from tools or objects such as pots, bells, or metal plates, making them dual-purpose in nature.

• Importance in Indian Tradition: Instruments like manjira (cymbals) are used in devotional music and folk traditions, symbolizing

rhythm and continuity.

• Global Context: Similar idiophones, like xylophones and maracas, are found in various cultures worldwide, showcasing the universality of Ghana Vadya-like instruments.

Q72. Answer: (b) Watt per square metre (W/ m²)

The correct answer is Watt per square metre (W/m^2).

Key Points

• Sound intensity is defined as the power per unit area carried by a sound wave.

• The SI unit for sound intensity is Watt per square metre (W/m^2), where 1 W/m^2 corresponds to one watt of sound power passing through an area of one square metre.

• Sound intensity helps quantify the loudness of sound and is widely used in acoustics and sound engineering.

• The threshold of human hearing is approximately 10^-12 W/m^2, which represents the faintest sound audible to a healthy human ear.

• Sound intensity is measured with devices such as sound level meters, which calculate the sound energy passing through a given area.

Additional Information

• Decibel (dB):

• Sound intensity is often expressed in decibels (dB), which is a logarithmic scale used to compare the intensity of a sound to a reference level.

• The formula for sound intensity in decibels is: dB = 10 log10 (I/I0), where I is the intensity of the sound and I0 is the reference intensity.

• Power and Area Relationship:

• Sound intensity is derived from the ratio of sound power to the area through which the sound energy travels.

• Mathematically, it is expressed as I = P/A, where I is intensity, P is power, and A is area.

• Threshold of Pain:

• At approximately 1 W/m^2, sound intensity reaches the threshold of pain, which can cause physical discomfort or damage to the human ear.

• Factors Affecting Sound Intensity:

• Sound intensity is influenced by factors such as the distance from the sound source, the medium of propagation, and the frequency of the sound wave.

• As distance from the sound source increases, intensity decreases due to energy dispersion over a larger area.

Q73. Answer: (d) T

Given:

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

Only three people sit between T and R when counted from the left of T.

B is an immediate neighbour of S as well as R.

Only three people sit between A and S when counted from the right of S.

C sits to the immediate right of A.

Thus, T sits third to the right of D.

Hence, the correct answer is "Option 4".

Q74. Answer: (d) $x^2 - 18x - 45 = 0$

Shortcut Trick

If the roots of a quadratic equation f(x) = 0 are multiplied by a constant k, the new equation is given by f(x/k) = 0.

Given k = 3 and f(x) = x2 − 6x − 5 = 0.

Substitute x with x/3 in the equation: (x/3)2 − 6(x/3) − 5 = 0

=> x2/9 − 2x − 5 = 0

Multiply the entire equation by 9: x2 − 18x − 45 = 0

Therefore The correct answer is x2 − 18x − 45 = 0.

Alternate Method

Given:

Original quadratic equation: x2 − 6x − 5 = 0

Roots of the equation: α and β

Formula used:

For a quadratic equation ax2 + bx + c = 0:

1. Sum of roots (α + β) = −b/a

2. Product of roots (αβ) = c/a

3. Equation with roots p and q: x2 − (p + q)x + (pq) = 0

Calculations:

From the given equation x2 − 6x − 5 = 0:

=> α + β = −(−6)/1 = 6

=> αβ = −5/1 = −5

The new roots are 3α and 3β.

=> New Sum of roots (S) = 3α + 3β = 3(α + β) = 3 × 6 = 18

=> New Product of roots (P) = (3α) × (3β) = 9(αβ) = 9 × (−5) = −45

The new equation is: x2 − Sx + P = 0

=> x2 − 18x + (−45) = 0

=> x2 − 18x − 45 = 0

Therefore The correct answer is x2 − 18x − 45 = 0.

Additional Information

Nature of Roots

The nature of roots is determined by the Discriminant (D) = b2 − 4ac. If D > 0, roots are real and distinct; if D = 0, roots are real and equal; if D < 0, roots are imaginary.

Transformation of Equations

To find an equation whose roots are reciprocals (1/α, 1/β) of the original roots, replace x with 1/x in the original equation to get cx2 + bx + a = 0.

Symmetric Roots

If the new roots are negative of the original roots (−α, −β), replace x with −x in the equation, resulting in ax2 − bx + c = 0.

Q75. Answer: (b) XXA

The logic followed here is:

Hence, the correct answer is "Option 2".

Q76. Answer: (d) To save the current changes made to the file

The correct answer is To save the current changes made to the file.

Key Points

• The keyboard shortcut Ctrl + S in MS PowerPoint is used to save the current changes made to the presentation file.

• It ensures that the most recent edits or modifications are stored, preventing data loss in case of unexpected shutdowns.

• Using this shortcut frequently is considered a good practice, especially during long work sessions, to avoid losing progress.

• The functionality is consistent across most Microsoft Office applications, including MS Word, MS Excel, and MS PowerPoint.

• Upon pressing Ctrl + S, the system either saves the file immediately or prompts the user to specify a location and file name if the file has not been saved previously.

Additional Information

• Keyboard Shortcuts in MS PowerPoint

• Ctrl + N: Create a new presentation.

• Ctrl + O: Open an existing presentation.

• Ctrl + P: Print the current presentation.

• Ctrl + F: Open the Find dialog box to search text within the presentation.

• F5: Start the slideshow from the beginning.

• Importance of Saving Files

• Ensures that all the recent updates and modifications are preserved.

• Prevents data loss due to unexpected system crashes or power failures.

• Allows collaboration, as saved files can be shared with others without losing changes.

• AutoSave Feature in MS Office

• MS PowerPoint and other Office apps include an AutoSave feature that automatically saves files at regular intervals.

• This feature is particularly useful for cloud-based files stored on OneDrive or SharePoint.

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• Even with AutoSave enabled, using Ctrl + S periodically is a recommended practice.
• File Formats in MS PowerPoint
• The default file format for MS PowerPoint presentations is .pptx.
• Other supported formats include .ppt, .pdf, .odp (OpenDocument Presentation), and .ppsx (PowerPoint Show).
• Saving files in different formats allows compatibility with other platforms and devices.

Q77. Answer: (a) 2

Given:

1 is added to each odd digit and 2 is subtracted from each even digit in the number 4275613.

Given	4	2	7	5	6	1	3
Operation	-2	-2	+1	+1	-2	+1	+1
New number	2	0	8	6	4	2	4

The new number formed is 2086424.

The digits 2 and 4 appear more than once.

Thus, two digits appear more than once in the new number.

Hence, the correct answer is "Option 1".

Q78. Answer: (d) 162 m

Shortcut Trick

Convert Speed to m/s: 36 × 5/18 = 10 m/s.

Convert Time to seconds: 1.7 × 60 = 102 seconds.

Total Distance (Train + Platform) = 10 × 102 = 1020 m.

Platform Length = 1020 − 591 = 429 m.

Difference = 591 − 429 = 162 m.

Therefore The correct answer is 162 m.

Alternate Method

Given:

Length of Train (L_t) = 591 m

Speed (S) = 36 km/hr = 36 × (5/18) m/s = 10 m/s

Time (T) = 1.7 minutes = 1.7 × 60 s = 102 s

Calculations:

=> Total Distance = L_t + L_p

=> Total Distance = Speed × Time

=> 591 + L_p = 10 × 102

=> 591 + L_p = 1020

=> L_p = 1020 − 591 = 429 m

=> Required Difference = |L_t − L_p|

=> Difference = 591 − 429 = 162 m

Therefore The correct answer is 162 m.

Additional Information

Unit Conversion

To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Train Crossing Objects

When a train crosses a stationary object with length (like a platform or bridge), total distance = length of train + length of object.

Speed, Distance, Time Relation

Distance = Speed × Time. Ensure all units are in the same system (m, m/s, seconds) before calculation.

Q79. Answer: (d) Rashtriya Gokul Mission

The correct answer is Rashtriya Gokul Mission.

Key Points

• The Rashtriya Gokul Mission (RGM) was launched in December 2014 under the National Programme for Bovine Breeding and

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Dairy Development by the Government of India.

• The mission primarily focuses on the conservation and development of indigenous bovine breeds to enhance milk productivity and profitability for dairy farmers.

• Under the mission, initiatives such as the establishment of Gokul Grams (integrated cattle care centers) have been implemented to ensure scientific management of livestock.

• The program provides financial assistance for the strengthening of bull mother farms, setting up of semen stations, and promoting artificial insemination to improve breed quality.

• RGM has played a significant role in boosting milk production in India, contributing to the country becoming the world's top milk producer in 2024.

Additional Information

• White Revolution

• The White Revolution in India was initiated in 1970 under Operation Flood, led by the National Dairy Development Board (NDDB) and spearheaded by Dr. Verghese Kurien.

• It transformed India from a milk-deficient country into the largest producer of milk and dairy products globally.

• It introduced modern dairy farming techniques and enhanced rural incomes, making it a landmark in India's dairy sector.

• National Dairy Development Program

• This initiative aims to increase milk production and productivity by strengthening dairy infrastructure and providing technical support to farmers.

• It complements the Rashtriya Gokul Mission in achieving long-term sustainability in dairy farming.

• Artificial Insemination in Livestock

• Artificial insemination involves the manual introduction of semen into the female reproductive tract to ensure controlled and high-quality breeding.

• This technology is a cornerstone of the Rashtriya Gokul Mission, helping to improve the genetic traits of indigenous cattle breeds.

• Indigenous Breeds of Cattle

• India is home to several high-quality indigenous cattle breeds, such as Gir, Sahiwal, and Red Sindhi.

• These breeds are known for their adaptability, disease resistance, and significant contribution to milk production under the Rashtriya Gokul Mission.

Q80. Answer: (b) Dronasimha

The correct answer is Dronasimha.

Key Points

• Dronasimha was a ruler of the Maitraka dynasty, which was established in the early 6th century CE in Gujarat.

• The earliest land grant by the Maitraka family, dated to 502 CE, was issued by Dronasimha.

• The Maitrakas were known for their patronage of Brahmanical Hinduism and grant practices to promote religious and social welfare.

• Dronasimha’s rule marked the beginning of the Maitraka dynasty, which rose to prominence in Western India.

• The Maitraka rulers, including Dronasimha, were instrumental in the development of administrative systems and religious institutions in the region.

Additional Information

• Maitraka Dynasty:

• The Maitraka dynasty was established in Gujarat, India, in the early 6th century CE.

• The dynasty is believed to have been founded by a military officer who declared independence from the Gupta Empire.

• Its capital was located at Vallabhi, which became a center of learning and culture during their reign.

• Land Grants in Ancient India:

• Land grants were commonly issued by rulers to Brahmins, temples, or monasteries for religious and social purposes.

• These grants often came with tax exemptions and administrative privileges.

• They were recorded on copper plates, which served as official documents of the grant.

• Significance of Copper Plates:

• Copper plates were used in ancient India to record significant events such as land grants and royal decrees.

• They provide valuable historical evidence about administrative practices, religion, and society.

• Many copper plates from the Maitraka dynasty have been discovered, offering insights into their governance and culture.

• Vallabhi as a Learning Center:

• Under the Maitraka dynasty, Vallabhi became an important center for Buddhist and Brahmanical learning.

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• Scholars from Vallabhi contributed significantly to literature, philosophy, and religious discourse.
• The Maitraka rulers supported educational and cultural activities, enhancing the region's intellectual legacy.

Q81. Answer: (d) OJ - NL

The logic followed here is.
Option (1) 'GI - NP':
Option (2) 'IK - PR':
Option (3) 'HJ - OQ':
Option (4) 'OJ - NL':
Thus, option 4 is odd one.
Hence, the correct answer is "Option 4".

Q82. Answer: (b) LM 6

The logic followed here is:
TX 12 is related to RS 23
GW 2 is related to ER 13
NR -5 is related to
NR -5 is related to LM 6.
Hence, the correct answer is "Option 2".

Q83. Answer: (d) 57.1

Shortcut Trick
Net change in marks = (Correct marks) − (Incorrect marks)
Net change = (72 + 64) − (27 + 46) = 136 − 73 = +63
Average deviation = 63 ÷ 30 = 2.1
Actual Average = Initial Average + Deviation = 55 + 2.1 = 57.1
Therefore The correct answer is 57.1.
Alternate Method
Given: Total students = 30, Initial average = 55, Errors = (27 instead of 72) and (46 instead of 64).
Formula: Correct Average = (Correct Sum of Observations) ÷ (Number of Observations)
=> Initial Total Marks = 30 × 55 = 1650
=> Correct Total Marks = 1650 − (27 + 46) + (72 + 64)
=> Correct Total Marks = 1650 − 73 + 136
=> Correct Total Marks = 1713
=> Actual Average = 1713 ÷ 30
=> Actual Average = 57.1
Therefore The correct answer is 57.1.
Additional Information
Properties of Average (Arithmetic Mean)
If every observation in a set is increased or decreased by a constant value k, the new average will also increase or decrease by k.
Net Deviation Rule
The sum of deviations of all observations from their arithmetic mean is always zero. This principle helps in quickly finding missing values or correcting errors.
Weighted Average
When two or more groups are combined, the combined average = (n1x1 + n2x2) ÷ (n1 + n2), where n is the count and x is the average of each group.

Q84. Answer: (d) 87

Shortcut Trick
Equate the Total Work: (13M + 3W) × 7 = (5M + 6W) × 18
91M + 21W = 90M + 108W
91M − 90M = 108W − 21W
1M = 87W

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Therefore The correct answer is 87 women.

Alternate Method

Given:

Case 1: 13 men and 3 women in 7 days.

Case 2: 5 men and 6 women in 18 days.

Formula Used:

Total Work = Efficiency × Time

Calculations:

Let the efficiency of one man be M and one woman be W.

=> Total Work = (13M + 3W) × 7

=> Total Work = (5M + 6W) × 18

=> 7(13M + 3W) = 18(5M + 6W)

=> 91M + 21W = 90M + 108W

=> 91M − 90M = 108W − 21W

=> 1M = 87W

=> Therefore, the work of 1 man is equivalent to 87 women.

Therefore The correct answer is 87 women.

Additional Information

Work Equivalence Principle

When multiple groups perform the same work, we equate the product of their total efficiency and time: M1D1 = M2D2.

Efficiency Ratio

The ratio of the efficiency of a man to a woman is inversely proportional to the number of people required to do the same work.

Q85. Answer: (b) 12

Given:

1 is added to each odd digit and 2 is subtracted from each even digit in the number 1385762.

Given	**1**	**3**	**8**	**5**	**7**	**6**	**2**
Operation	+1	+1	-2	+1	+1	-2	-2
New number	2	4	6	6	8	4	0

The new number formed is 2466840.

The second digit from the left is 4.

The third digit from the right is 8.

The sum of these two digits is 4 + 8 = 12.

Hence, the correct answer is "Option 2".

Q86. Answer: (c) = SUY, % = JLP

Given:

: VXB :: GIM : %

Option 1) # = SUY, % = LLP

For GIM to % (LLP)

Option 1 is incorrect.

Option 2) # = SEY, % = JLP

For # (SEY) to VXB

For GIM to % (JLP)

Option 2 is incorrect.

Option 3) # = SUY, % = JLP

For # (SUY) to VXB

For GIM to % (JLP)

Option 3 is correct.

Option 4) # = SUY, % = JLL

For # (SUY) to VXB

For GIM to % (JLL)

Option 4 is incorrect.

Hence, the correct answer is "Option 3".

Q87. Answer: (d) 90

Given:

Piyush's rank from the top = 34th

Piyush's rank from the bottom = 57th

The formula for the total number of persons in a row:

Total persons = (Rank from one end) + (Rank from other end) - 1

= (Piyush's rank from top) + (Piyush's rank from bottom) - 1

= 34 + 57 - 1

= 91 - 1

= 90 students.

Hence, the correct answer is "Option 4".

Q88. Answer: (a) 19

Shortcut Trick

Let the HCF be x.

Numbers = 1x, 3x, 5x

LCM of (1, 3, 5) × HCF = 285

15 × x = 285 => x = 19

Therefore The correct answer is 19.

Alternate Method

Given:

Ratio of numbers = 1 : 3 : 5

LCM = 285

Formula Used:

If numbers are in ratio a : b : c, then their LCM = HCF × LCM(a, b, c)

Calculations:

=> Let the HCF be H.

=> The numbers are 1H, 3H, and 5H.

=> Since 1, 3, and 5 are co-prime to each other, their LCM is 1 × 3 × 5 = 15.

=> Total LCM = 15 × H

=> 15 × H = 285

=> H = 285 ÷ 15

=> H = 19

Therefore The correct answer is 19.

Additional Information

Product of Two Numbers

For any two numbers A and B, the product of the numbers is equal to the product of their HCF and LCM: A × B = HCF × LCM.

HCF of Fractions

HCF of fractions = (HCF of Numerators) ÷ (LCM of Denominators).

Co-prime Numbers

Two numbers are said to be co-prime if their HCF is 1. The LCM of co-prime numbers is always their product.

Q89. Answer: (d) 5 : 7

Shortcut Trick

For two similar triangles, the ratio of their areas is equal to the square of the ratio of their corresponding sides.

Ratio of sides = √(Ratio of areas)

AB : PQ = √(25 : 49) = 5 : 7

Therefore The correct answer is 5 : 7.

Alternate Method

Given:

ΔABC ~ ΔPQR

Area(ΔABC) / Area(ΔPQR) = 25 / 49

Formula Used:

Area(Δ1) / Area(Δ2) = (Side1 / Side2)²

Calculations:

=> Area(ΔABC) / Area(ΔPQR) = (AB / PQ)²

=> 25 / 49 = (AB / PQ)²

=> AB / PQ = √(25 / 49)

=> AB / PQ = 5 / 7

=> AB : PQ = 5 : 7

Therefore The correct answer is 5 : 7.

Q90. Answer: (b) 183

The logic followed here is:

Thus, the missing number in the series is 183.

Hence, the correct answer is "Option 2".

Q91. Answer: (c) Eviction of a child or relative is mandatory in every case of neglect under the Act

The correct answer is Eviction of a child or relative is mandatory in every case of neglect under the Act.

Key Points

• The Supreme Court ruling in 'Samtola Devi vs The State Of Uttar Pradesh' (2025) clarified that eviction under the Maintenance and Welfare of Parents and Senior Citizens Act, 2007, is not mandatory in every case of neglect.

• The Act empowers tribunals to order eviction only if it is deemed necessary for the protection and welfare of the senior citizen involved.

• There is no blanket provision in the Act that mandates eviction in all cases of neglect by children or relatives.

• The Act also allows senior citizens to file for maintenance even after transferring their property to legal heirs.

• The Supreme Court emphasized that the Act's primary aim is to ensure the welfare and dignity of senior citizens, not punitive eviction measures.

Additional Information

• Maintenance and Welfare of Parents and Senior Citizens Act, 2007:

• This Act was enacted to ensure financial and emotional support for senior citizens and parents.

• It provides a mechanism for senior citizens to claim maintenance from their children or legal heirs.

• The Act also includes provisions for tribunals to address disputes and ensure quick resolution.

• Eviction Provisions under the Act:

• The Act does not explicitly mandate eviction but allows tribunals to order eviction if necessary to protect senior citizens.

• This power is often used in cases where senior citizens face harassment, abuse, or neglect.

• Supreme Court's Role:

• The Supreme Court serves as the highest authority to interpret laws and clarify ambiguities in their implementation.

• In this case, the Court clarified that eviction should not be treated as mandatory in all neglect cases.

• Rights of Senior Citizens:

• Senior citizens can seek maintenance, protection, and remedies under the Act.

• They are also entitled to reclaim property or assets transferred under undue influence or in cases of neglect.

Q92. Answer: (d) Ranabhandagarika

The correct answer is Ranabhandagarika.

Key Points

• The term Ranabhandagarika was used in the Gupta Empire to denote the officer responsible for managing military stores and supplies.

• This position was crucial in ensuring that the army was well-equipped with weapons, armor, and other logistical necessities during war and peace times.

• The Gupta period is often referred to as the "Golden Age" of India, and its administrative structure was highly organized, including specialized roles like the Ranabhandagarika.

• The position of Ranabhandagarika highlights the importance of maintaining a robust and well-stocked military infrastructure

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during the Gupta reign.

• This role was part of a larger hierarchical governance system, where officials were entrusted with specific responsibilities to ensure efficiency and stability in the empire.

Additional Information

• Gupta Empire Administration

• The Gupta Empire had a highly centralized administrative system with clearly defined roles for officials.

• Officers like the Ranabhandagarika were part of the administrative machinery to ensure smooth functioning of various state operations.

• Other notable officials included the Mahadandanayaka (Chief Judicial Officer) and Mahabaladhikrita (Commander-in-Chief).

• Military Organization

• The Gupta Empire maintained a strong military, including infantry, cavalry, war elephants, and a navy.

• Military preparedness was essential for defending the empire and expanding its territorial boundaries.

• Officers like Ranabhandagarika played a key role in ensuring the logistical readiness of the army.

• Economic Prosperity during Gupta Era

• The Gupta Empire is known for its economic prosperity, which enabled the maintenance of a strong military and administrative structure.

• Trade, agriculture, and a well-organized taxation system contributed to the empire's wealth.

• Golden Age of India

• The Gupta period is known as the "Golden Age" due to advancements in science, art, literature, and administration.

• Leaders like Chandragupta I, Samudragupta, and Chandragupta II played pivotal roles in the empire's growth.

Q93. Answer: (a) 3

Given series:

(Left) # 1 9 7 $ 9 1 5 2 @ 6 8 # € £ & 8 $ 4 5 9 5 (Right)

Condition to be checked:

Number → Number → Symbol

1 9 7 $ 9 1 5 2 @ 6 8 # € £ & 8 $ 4 5 9 5

There are three such numbers in the above arrangement (9 7 $, 5 2 @, 6 8 #).

Hence, the correct answer is "Option 1".

Q94. Answer: (a) Ctrl + N

The correct answer is Ctrl + N.

Key Points

• The shortcut key Ctrl + N is used to quickly create a new blank presentation in MS PowerPoint 365.

• Pressing Ctrl + N opens a fresh presentation file, allowing users to start working on a new project instantly.

• This shortcut is universally applicable across most versions of Microsoft PowerPoint, including older versions and Office 365.

• Using shortcuts like Ctrl + N enhances productivity by minimizing navigation through menus and providing direct access to essential features.

• It is a part of the broader set of keyboard shortcuts in Microsoft Office applications designed to simplify and speed up workflow.

Additional Information

• Keyboard Shortcuts in MS PowerPoint

• Ctrl + O: Opens an existing presentation file.

• Ctrl + S: Saves the currently open presentation.

• Ctrl + P: Opens the Print dialog box to print the presentation.

• Ctrl + M: Inserts a new slide in the current presentation.

• Ctrl + D: Duplicates the selected slide.

• Importance of Shortcuts in MS PowerPoint

• Keyboard shortcuts save time and improve efficiency by reducing the need to navigate through menus.

• They help users maintain focus on the content creation process rather than interrupting the flow for manual operations.

• Understanding and utilizing shortcuts is especially beneficial for professionals working on tight deadlines.

• Other Productivity Features in MS PowerPoint 365

• Design Ideas: Auto-generates design suggestions to enhance the visual appeal of slides.

• Presenter Coach: Provides real-time feedback during practice presentations.

• Slide Zoom: Allows users to create interactive navigation for a non-linear presentation flow.
• Cloud Integration: Enables collaboration and access to presentations from any device.

Q95. Answer: (a) 28,125

Shortcut Trick

For a time period of 2 years, the difference (D) between Compound Interest and Simple Interest is:

$D = P \times (R/100)^2$

Given Difference = Rs. 45 and Rate (R) = 4%.

$45 = P \times (4/100)^2 \Rightarrow 45 = P \times (1/25)^2$

$P = 45 \times 625 = 28,125$

Therefore The correct answer is Rs. 28,125.

Alternate Method

Given:

Rate of Interest (R) = 4% per annum, Time (T) = 2 years, Difference = Rs. 45.

=> Simple Interest (SI) rate for 2 years = 4% × 2 = 8%

=> Compound Interest (CI) effective rate for 2 years = 4 + 4 + (4 × 4)/100 = 8.16%

=> Difference in rates = 8.16% − 8% = 0.16%

=> According to question, 0.16% of Sum = Rs. 45

=> Sum = (45 ÷ 0.16) × 100

=> Sum = (45 ÷ 16) × 10000 = 2.8125 × 10000 = 28,125

Therefore The correct answer is Rs. 28,125.

Additional Information

Difference for 3 Years

For a 3-year period, the difference between CI and SI is $D = P(R/100)^2 \times (3 + R/100)$.

Effective Interest Rate

For CI at r% for 2 years, the effective rate is $(2r + r^2/100)\%$, helping in direct percentage calculations.

Relation between CI and SI for 2 years

Compound Interest (CI) = Simple Interest (SI) × (1 + R/200), applicable only for a 2-year duration.

Q96. Answer: (a) Loop of Henle

The correct answer is Loop of Henle.

Key Points

• The Loop of Henle is a critical segment of the nephron responsible for generating the osmotic gradient necessary for urine concentration.
• It consists of two limbs: the descending limb, which is permeable to water, and the ascending limb, which is impermeable to water but actively transports sodium and chloride ions.
• The countercurrent multiplier system in the Loop of Henle helps establish a gradient of solutes in the renal medulla, allowing water reabsorption in later nephron segments.
• The concentrated interstitial fluid created by the Loop of Henle is essential for water reabsorption in the collecting ducts under the influence of antidiuretic hormone (ADH).
• This mechanism allows the kidneys to concentrate urine and conserve water, especially during dehydration.

Additional Information

• Structure of the Nephron:
• A nephron is the functional unit of the kidney and includes the glomerulus, proximal convoluted tubule, Loop of Henle, distal convoluted tubule, and collecting duct.
• The Loop of Henle is located between the proximal tubule and the distal tubule.
• Countercurrent Multiplier System:
• This system involves the flow of filtrate through the Loop of Henle in opposite directions in the descending and ascending limbs.
• It helps create a hyperosmotic medulla, which is crucial for water reabsorption in the collecting ducts.
• Osmotic Gradient:
• The osmotic gradient is maintained by the active transport of ions in the thick ascending limb of the Loop of Henle.
• Urea recycling in the collecting duct also contributes to the gradient.
• Role of Antidiuretic Hormone (ADH):

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• ADH increases the permeability of the collecting ducts to water, allowing water to move out of the ducts and into the hyperosmotic medulla.
• This process helps concentrate urine and reduce water loss.
• Clinical Significance:
• Dysfunction in the Loop of Henle can lead to conditions like nephrogenic diabetes insipidus or inability to concentrate urine.
• Diuretics like loop diuretics target the Loop of Henle to reduce water reabsorption in cases of fluid overload.

Q97. Answer: (a) 4 cm

Shortcut Trick
When a solid hemisphere is melted into a cylinder of the same radius, equate their volumes.
Volume of Hemisphere = (2/3) × π × r^3
Volume of Cylinder = π × r^2 × h
Since radii are equal: (2/3) × r = h
h = (2/3) × 6 = 4 cm
Therefore The correct answer is 4 cm.
Alternate Method
Given:
Radius of Hemisphere (r) = 6 cm
Radius of Cylinder (R) = 6 cm
Formula Used:
Volume of a Hemisphere = (2/3)πr^3
Volume of a Cylinder = πR^2h
Calculations:
=> Volume of Cylinder = Volume of Hemisphere
=> π × $(6)^2$ × h = (2/3) × π × $(6)^3$
=> 36 × h = (2/3) × 216
=> 36 × h = 2 × 72
=> 36 × h = 144
=> h = 144 ÷ 36
=> h = 4 cm
Therefore The correct answer is 4 cm.
Additional Information
Conversion of Solids
When one solid object is melted to form another, the Total Volume remains constant, provided there is no wastage of material.
Properties of a Sphere
Volume of Sphere = (4/3)πr^3 and Total Surface Area = 4πr^2. A hemisphere is exactly half of a sphere.
Cylinder Surface Area
Curved Surface Area = 2πrh and Total Surface Area = 2πr(h + r).

Q98. Answer: (b) 3

The given code language is:
Thus, 'L' is coded as '3'.
Hence, the correct answer is "Option 2".

Q99. Answer: (c) 24%

Shortcut Trick
Let the Cost Price (CP) be 100 units.
Marked Price (MP) = 100 + 50% of 100 = 150 units.
Desired Selling Price (SP) for 14% gain = 100 + 14 = 114 units.
Discount to be allowed = MP − SP = 150 − 114 = 36 units.
Discount% = (Discount ÷ MP) × 100 = (36 ÷ 150) × 100 = 24%.
Therefore The correct answer is 24%.
Alternate Method

Given: Markup% = 50%, Gain% = 14%.

Formulas: SP = CP × (100 + Profit%) ÷ 100 | MP = CP × (100 + Markup%) ÷ 100 | Discount% = (MP − SP) ÷ MP × 100.

=> Assume Cost Price = 100.

=> Marked Price = 100 × (150 ÷ 100) = 150.

=> Selling Price for 14% profit = 100 × (114 ÷ 100) = 114.

=> Discount = MP − SP = 150 − 114 = 36.

=> Discount Percentage = (36 ÷ 150) × 100 = 24%.

Therefore The correct answer is 24%.

Additional Information

Marked Price & Discount

The price listed on the label is the Marked Price. Discount is always calculated on this value to reach the final Selling Price.

Relation Formula

MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%). This ratio can directly solve for missing variables in markup/discount problems.

Q100. Answer: (a) 84

Shortcut Trick

Weighted Average = (Value1 × w1 + Value2 × w2) ÷ (w1 + w2)

Sum = (80 × 3) + (90 × 2) = 240 + 180 = 420

Total Weight = 3 + 2 = 5

Weighted Average = 420 ÷ 5 = 84

Therefore The correct answer is 84 marks.

Alternate Method

Given: Score 1 = 80 (Weightage = 3), Score 2 = 90 (Weightage = 2).

Formula Used: Weighted Average = Σ (Weight × Score) ÷ Σ (Weight)

=> Total Marks = (80 × 3) + (90 × 2)

=> Total Marks = 240 + 180 = 420

=> Total Weightage = 3 + 2 = 5

=> Weighted Average = 420 ÷ 5

=> Weighted Average = 84

Therefore The correct answer is 84 marks.

Additional Information

Weighted Average Formula

It is calculated as (w1x1 + w2x2 + ... + w_nx_n) ÷ (w1 + w2 + ... + w_n), where x represents values and w represents their respective weights.

Comparison with Simple Average

A Simple Average is a special case of the weighted average where all weights are equal (w1 = w2 = ... = w_n).

Combined Mean

If two groups have sizes n1, n2 and averages x1, x2, the Combined Mean is (n1x1 + n2x2) ÷ (n1 + n2).

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