RRB NTPC Graduate Level CBT-I Official Paper (Held On: 17 Jun, 2025 Shift 3) (Previous Year Paper)

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

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Q1. In a certain code language, 'MICE' is coded as '6398' and 'PEAR' is coded as '3215'. What is the code for 'E' in the given code language?

(a) 8
(b) 5
(c) 3
(d) 2

Q2. Which metals are generally used for electrical transmission lines?

(a) Silver and gold
(b) Zinc and lead
(c) Iron and nickel
(d) Copper and aluminium

Q3. 4 times the present age of P e×ceeds the present age of Q by 35 years. After 8 years, 2 times the age of Q will be 40 years less than 6 times the age of P. The present age of Q (in years) is:

(a) 80
(b) 84
(c) 89
(d) 97

Q4. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

(2, 20, 4)

(5, 61, 6)

(a) (1, 8, 3)
(b) (4, 40, 6)
(c) (7, 45, 2)
(d) (3, 25, 4)

Q5. For $7x^2 - 4x + k = 0$, determine the value of k so that the equation has equal roots

(a) 4/5
(b) 4/7
(c) 4/11
(d) 3/7

Q6. In the context of the 2024 Haryana Assembly elections, which of the following statements is/are correct?

1. The BJP retained power with a clear majority.
2. BJP increased its seats compared to the 2019 Assembly elections.
3. Congress decreased its seats compared to the 2019 elections.
4. The vote share difference between BJP and Congress was narrow, with BJP securing 39.94% and Congress

39.09%.

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

Q7. A sum when invested at the rate of 12.5% simple interest per annum, amounts to Rs. 7,500 after 2 years. The simple interest (in Rs.) for the given time period is:

(a) 1,400
(b) 1,500
(c) 1,600
(d) 1,700

Q8. Which state recorded the lowest unemployment rate according to the PLFS 2022-23?

(a) Tripura
(b) Gujarat
(c) Karnataka
(d) Maharashtra

Q9. Who among the following was a radical rationalist and iconoclast in Maharashtra?

(a) Vishnushastri Chiplunkar
(b) Ganesh Vasudev Joshi
(c) Bhaskar Pandurang
(d) Gopal Ganesh Agarkar

Q10. Find the area of four walls of a cube, the length of whose edge is (3x + 8y + 5) m.

(a) $(36x^2 + 256y^2 + 100 + 192xy + 160y + 120x)$ m²
(b) $(36x^2 + 184y^2 + 100 + 192xy + 160y + 80x)$ m²
(c) $(36x^2 + 124y^2 + 100 + 82xy + 160y + 80x)$ m²
(d) $(36x^2 + 256y^2 + 100 + 192xy + 320y + 120x)$ m²

Q11. If sinA = 4/5, then find the value of (2 + tanA)(4 + cosA).

(a) 46/3
(b) 15/208
(c) 208/15
(d) 3/46

Q12. Where did the International Summit on the Future of Energy Security take place in April 2025?

(a) Paris, France
(b) London, United Kingdom
(c) Berlin, Germany
(d) Tokyo, Japan

Q13. Which river system is known for forming gorges in the Himalayan region?

(a) Godavari
(b) Tapti
(c) Penner
(d) Brahmaputra

Q14. 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 9 # 1 9 © 3 5 © € @ # £ @ * © 5 £ € 5 4 4 (Right)

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

(a) 4

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

Q15. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

QT-OR-MP

XA-VY-TW

(a) TW-RU-PS
(b) JM-HK-FJ
(c) NQ-LO-JN
(d) AD-YB-VZ

Q16. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

187 ÷ 3 + 168 × 2 − 174 = ?

(a) 651
(b) 653
(c) 652
(d) 654

Q17. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.

ELX IJT MHP ? UDH

(a) QFL
(b) QGL
(c) QFK
(d) QGK

Q18. In October 2024, the Indian government notified rules under the Jan Vishwas (Amendment of Provisions) Act, 2023. What was a key objective of this legislation?

(a) To convert minor offenses under various laws from criminal to civil penalties
(b) To legalise digital signatures for land registration documents
(c) To expand the RTI Act to cover private educational institutions
(d) To establish a unified grievance redressal portal for all central ministries

Q19. 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 :: ?

: EPV :: RFS : %

(a) = DNU, % = SHT
(b) = CNU, % = THV
(c) = COW, % = SGQ
(d) = DMU, % = SGL

Q20. Which of the following government schemes focuses on the development of urban infrastructure in India?

(a) AMRUT
(b) MGNREGA
(c) RURBAN Mission
(d) PMGSY

Q21. Which of the following numbers is divisible by 22?

(a) 7019
(b) 7986
(c) 7664
(d) 8371

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Q22. What should come in place of the question mark (?) in the given series?

4 10 22 46 94 190 ?

(a) 382
(b) 384
(c) 380
(d) 390

Q23. Sharda Sinha received the Padma Vibhushan posthumously in 2025 in which of the following fields?

(a) Medicine
(b) Spiritualism
(c) Art
(d) Sports

Q24. Besides resolving disputes, what power do the Nyaya Panchayats have in India?

(a) Managing village agriculture
(b) Imposing fines on offenders
(c) Issuing binding contracts
(d) Levying taxes for village development

Q25. The area of a quadrilateral ABCD is 299 cm^2. The lengths of the perpendiculars from the vertices B and D to the diagonal AC are 11 cm and 12 cm, respectively. Determine the length (in cm) of the diagonal AC.

(a) 24
(b) 26
(c) 29
(d) 21

Q26. The Thar Desert serves as a natural boundary between:

(a) India and Pakistan
(b) India and Afghanistan
(c) India and Nepal
(d) India and China

Q27. If the manufacturer gains 10%, the wholesale gains 15% and the retailer gains 25%, then find the cost of production of a table (in Rs.), whose retail price for the customer is Rs. 31,900. (NOTE: Manufacturer sells to wholesaler, wholesaler sells to retailer and retailer sells to customers.)

(a) 20,174
(b) 23,200
(c) 25,000
(d) 22,000

Q28. Chetan starts from Point Y and drives 37 km towards the south. He then takes a right turn, drives 18 km, turns right and drives 58 km. He then takes a left turn and drives 61 km. He takes a left turn, drives 21 km and stops 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) 64 km towards the west
(b) 43 km towards the west
(c) 39 km towards the south
(d) 79 km towards the east

Q29. If 7 : 14 :: 8.7 : x and 5 : 35 :: 7 : y. What is the ratio of x to y?

(a) 88 : 243
(b) 87 : 245
(c) 91 : 255
(d) 85 : 246

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Q30. What is the median of the following distribution?

Class	120-170	170-220	220-270	270-320	320-370
Frequency	18	34	17	13	22

(a) 227
(b) 220
(c) 224
(d) 216

Q31. The median of the observations 60, 43, 24, 61, 72, 26, 39, 62, 49, 95 and 38 is:

(a) 49
(b) 43
(c) 60
(d) 62

Q32. Prabhat, Dinesh, Yug, Monu, Sakshi, Amit and Shipra are sitting around a circular table, facing the centre. Yug sits second to the left of Amit. Prabhat sits third to the right of Amit. Monu sits to the immediate right of Dinesh. Shipra is not an immediate neighbour of Prabhat. Who sits second to the left of Dinesh?

(a) Prabhat
(b) Yug
(c) Sakshi
(d) Shipra

Q33. Where was the field demonstration of the DEW Mk-II(A) system conducted by DRDO in 2025?

(a) Kurnool
(b) Bengaluru
(c) New Delhi
(d) Pokhran

Q34. Amit had invested the same amount of sums at simple as well as compound interest, compounded annually. The time period of investment for both the sums was 2 years and rate of interest too was same, 4% per annum. At the end, he found a difference of Rs. 44 in both the interests received. What were the sums (in Rs.) invested?

(a) Rs. 26,600
(b) Rs. 27,850
(c) Rs. 26,750
(d) Rs. 27,500

Q35. This question is based on the five, three-digit numbers given below. (Left) 941 915 741 807 776 (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 third digit of the highest number is added to the first digit of the lowest number?

(a) 11
(b) 8
(c) 9
(d) 7

Q36. Find the value of √0.038025/√0.004225

(a) 3
(b) 11
(c) 6
(d) 21

Q37. 7 In a certain code language, ‘GATE’ is coded as ‘6148’ and ‘TIPS’ is coded as ‘5721’. What is the code for ‘T’ in the given code language?

(a) 1
(b) 5
(c) 4

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(d) 7

Q38. Which of the following terms was used for tanks or ponds in Gupta records?

(a) Nadi
(b) Kshetra
(c) Prapa
(d) Tadaga

Q39. What is the significance of pipelining in CPU architecture?

(a) Transfers data between registers
(b) Stores instructions in memory
(c) Increases clock speed using multiple cores
(d) Executes multiple instructions simultaneously by overlapping stages

Q40. A seller marks their goods 45% above the cost price. On customer demand, they offer a 60% reduction on the bills. What percentage of profit or loss does the seller make?

(a) 45% loss
(b) 39% profit
(c) 41% loss
(d) 42% loss

Q41. The side AB and AC of triangle ABC are produced to points D and E, respectively. The bisectors of angle CBD and angle BCE meet at P. If angle A = 84^?, then the measure of P is:

(a) 36°
(b) 66°
(c) 56°
(d) 48°

Q42. The BPO industry emerged due to globalisation. What is a key feature of Business Process Outsourcing (BPO)?

(a) Government ownership
(b) Manufacturing heavy goods
(c) Providing services to foreign companies from India
(d) Domestic services only

Q43. The 1991 reforms promoted deregulation of industries. Which industry continued to be reserved for public sector post-1991 reforms?

(a) Electronics
(b) Textile
(c) Atomic energy
(d) Automobiles

Q44. A boat travels 176 km upstream in 16 hours and 85 km downstream in 5 hours. What is the speed of the boat in still water?

(a) 14 km/hr
(b) 23 km/hr
(c) 20 km/hr
(d) 24 km/hr

Q45. The average score of 10 players was initially recorded as 55. However, it was later discovered that a score of 84 had been mistakenly read as 48. Determine the correct average score.

(a) 55.5
(b) 58.6
(c) 48.5
(d) 50

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Q46. 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. V has an exam on Friday. Exactly 3 people have exams between Q and S, neither of whom has on exam on Sunday. P has an exam immediately after U. T has an exam immediately before S. How many people have exams before U?

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

Q47. Which of the following scenarios would most effectively necessitate the use of a 'Keep with Next' paragraph formatting option in MS Word?

(a) Ensuring that a heading and the paragraph immediately following it always appear on the same page
(b) Automatically indenting the first line of every paragraph in a document
(c) Preventing a long paragraph from being split across multiple pages
(d) Applying a consistent bullet point style to a list of items

Q48. Rajat ranked 16th from the top and 55th from the bottom in his class. How many students are there in his class?

(a) 69
(b) 70
(c) 72
(d) 71

Q49. A person saves 30% of his income. If his expenditure is Rs. 560, then his income (in Rs.) is:

(a) 800
(b) 392
(c) 168
(d) 840

Q50. Which colonial power held Yanaon (Yanam) and Chandernagore as part of its possessions in India?

(a) Austrian
(b) German
(c) Portuguese
(d) French

Q51. The ratio of 39 hours to 17 days is:

(a) 39 : 17
(b) 13 : 136
(c) 12 : 142
(d) 14 : 143

Q52. Which of the following best describes the function of a 'Section Break (Next Page)' in MS Word?

(a) It starts a new paragraph while maintaining the same formatting.
(b) It ends the current section and starts a new section on the subsequent page
(c) It creates a visual divider between different parts of the document on the same page
(d) It inserts a manual line break within the same paragraph.

Q53. Select the pair that follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

HLF : JOH

UYR : WBT

(a) MFL : XRL
(b) SFJ : UIL
(c) MPQ : RMT
(d) SEK : VRT

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Q54. Which Indian Constitutional Amendment Act have decreased the Fundamental Rights from seven to six?

(a) 42nd Constitutional Amendment Act
(b) 76th Constitutional Amendment Act
(c) 44th Constitutional Amendment Act
(d) 35th Constitutional Amendment Act

Q55. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) KT – OH
(b) YH – CV
(c) BK – EY
(d) JS – NG

Q56. Which of the following systems was abolished by the Nineteenth Amendment Act, 1966?

(a) Privy purse system
(b) Zamindari system
(c) Separate electorate system
(d) Election tribunals

Q57. The Securities and Exchange Board of India (SEBI) has reduced the minimum investment for Zero Coupon Zero Principal (ZCZP) in the Social Stock Exchange (SSE) from Rs. 10,000 to _____.

(a) Rs. 1,500
(b) Rs. 1,000
(c) Rs. 2,000
(d) Rs. 500

Q58. Which of the following categories of MSMEs constitutes the major share of MSME registration on the Udyam Registration Portal?

(a) Large
(b) Micro
(c) Small
(d) Medium

Q59. Two taps can fill a cistern in 3 hours and 57 hours, respectively. A third tap can empty it in 3 hours. How long (in hours) will it take to fill one-third of the empty cistern, if all of them are opened together?

(a) 57
(b) 20
(c) 58
(d) 19

Q60. Where was the 2024 United Nations Biodiversity Convention (COP16) initially held?

(a) Rome, Italy
(b) Nairobi, Kenya
(c) Cali, Colombia
(d) Montreal, Canada

Q61. 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) QTP
(b) MPK
(c) KNI
(d) ORM

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Q62. Seven friends, D, E, F, G, M, N and O, are sitting in a row facing north. Only five people sit between G and D. F sits to the immediate left of D. Only one person sits between F and M. O sits at some place to the left of E but at some place to the right of N. Who sits third from the left end of the line?

(a) M
(b) O
(c) F
(d) N

Q63. Mr. Chotu starts from Point A and drives 16 km towards the North. He then takes a left turn, drives 8 km, turns left and drives 7 km. He then takes a right turn, drives 4 km, turns left and drives 12 km. He then takes a left turn and drives 18 km. He takes a final left turn, drives 3 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) 1 km to the North
(b) 4 km to the East
(c) 9 km to the South
(d) 6 km to the West

Q64. Which of the following Articles of the Indian Constitution states about the Official Language Commission in India?

(a) Article 342
(b) Article 344
(c) Article 343
(d) Article 341

Q65. The addition of H^+ ions to the equilibrium CH3COOH <=> CH3COO^- + H^+ will:

(a) Shift the equilibrium right
(b) Shift the equilibrium left
(c) Stop the reaction
(d) Lead to no change

Q66. The period from 1905 to 1917 is known as the "Extremist Phase" in the Indian National Movement. Which of the following leaders was NOT associated with the extremist ideology during this time?

(a) Lala Lajpat Rai
(b) Bipin Chandra Pal
(c) Bal Gangadhar Tilak
(d) Gopal Krishna Gokhale

Q67. Seven boxes, D, E, F, G, S, T and U, are kept one over the other but not necessarily in the same order. No box is kept above F. Only three boxes are kept between F and S. Only one box is kept between D and E. E is kept immediately above S. Only four boxes are kept between D and G. T is kept at some place above U. Which box is kept second below T?

(a) D
(b) S
(c) F
(d) G

Q68. Which of the following abbreviations represents a volatile memory technology commonly used for the primary working memory in personal computers?

(a) CMOS
(b) NVMe
(c) DRAM
(d) SRAM

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Q69. HL 17 is related to KM −4 in a certain way. In the same way, LN 12 is related to OO −9. To which of the given options is UR 4 related, following the same logic?

(a) VR 16
(b) XS −17
(c) IX −15
(d) OZ −18

Q70. If $a^2 + b^2 = 169$, $a \times b = 10$, and $a > b$, find $(a - b)/(a + b)$

(a) √(149/189)
(b) √(158/199)
(c) 158/199
(d) 149/189

Q71. In the architecture of a Central Processing Unit (CPU), which statement accurately distinguishes the function of the Arithmetic Logic Unit (ALU) from that of the Control Unit (CU)?

(a) ALU decodes instructions, while CU handles data storage tasks.
(b) CU executes arithmetic operations, and ALU controls program instructions.
(c) CU interacts directly with peripheral devices, and ALU stores temporary data
(d) ALU handles calculations and logic functions; CU manages instruction flow and coordination.

Q72. What will come in the place of the question mark (?) in the following equation, if '+' is replaced by '–' and '×' and '÷' are interchanged?

20 ÷ 5 + 8 × 2 + 1 = ?

(a) 85
(b) 80
(c) 95
(d) 90

Q73. The maximum number of Buddhist stupas had been built by which of the following rulers?

(a) Ashoka
(b) Pushyamitra Sunga
(c) Chandragupta Maurya
(d) Bimbisara

Q74. The volume (in cm^3) of a wire of diameter 6 cm and length 56 m is:

Take $\pi = 22/7$

(a) 1,58,800
(b) 1,58,400
(c) 1,57,800
(d) 1,59,000

Q75. Rishika travels a certain distance at a speed of 52 km/hr and double the earlier distance at 39 km/hr. She then returns to the starting point through the same route. If her average speed for the entire journey is 56 km/h, then what is her speed (in km/hr) for the return journey?

(a) 83.8
(b) 81.9
(c) 76
(d) 87

Q76. Which ruler of the Delhi Sultanate was associated with the expedition to Bhilsa (Vidisha) in AD 1292?

(a) Ghazi Malik
(b) Iltutmish
(c) Ulugh Khan
(d) Alauddin Khilji

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Q77. The sum of five numbers is 655. The average of the first two numbers is 77 and the third number is 101. Find the average of the remaining two numbers.

(a) 200
(b) 178
(c) 179
(d) 201

Q78. This question is based on the five, three-digit numbers given below.

(Left) 411 559 916 247 769 (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 lowest number is subtracted from the first digit of the highest number?

(a) 10
(b) 7
(c) 8
(d) 6

Q79. The curved surface area of a cylinder is half of its total surface area. If its height is 12 cm, then find its diameter (in cm).

(a) 33
(b) 20
(c) 24
(d) 22

Q80. Among the islet cells of the pancreas, which cell type secretes the hormone that primarily raises blood glucose levels?

(a) Delta cells
(b) Alpha cells
(c) PP cells
(d) Beta cells

Q81. Who among the following has been appointed as 26th Chief Election Commissioner of India in February 2025?

(a) Vineet Joshi
(b) Ashish Naithani
(c) Sanjay Malhotra
(d) Gyanesh Kumar

Q82. A man spends 28% of his monthly salary on house rent. If every month, he also spends Rs. 687 on conveyance and Rs. 7,483 on grocery and saves the remaining Rs. 218, his monthly salary is:

(a) Rs. 11,738
(b) Rs. 11,650
(c) Rs. 11,594
(d) Rs. 11,743

Q83. Who among the following was appointed as the Chairman of the Airports Authority of India (AAI), in October 2024?

(a) Praveena Rai
(b) Shashwat Sharma
(c) Deepak Agarwal
(d) Vipin Kumar

Q84. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

QJL OHJ MFH KDF ?

(a) IBE
(b) IAD
(c) IAE

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(d) IBD

Q85. Find the simplified value of [81 ÷ {21 + 9 × (5 - 7)}].

(a) 27
(b) 24
(c) 26
(d) 25

Q86. Which of the following statements regarding the Exercise INDRA held in March-April 2025 is/are correct?

1. The exercise included participation of Russian Federation Naval Ships Pechanga, Rezkiy, and Aldar Tsydenzhapov, along with Indian Naval Ships Rana, Kuthar, and Maritime Patrol Aircraft P8I.

2. The exercise was conducted in two phases: Harbour phase in Chennai and Sea phase in the Arabian Sea.

3. This was the 13th edition of Exercise INDRA, symbolises the long-term strategic relationship between India and Russia.

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

Q87. The greatest number that divides 48 and 46 leaving remainders 9 and 7, respectively, is:

(a) 43
(b) 39
(c) 47
(d) 46

Q88. Who among the following is the political head of the municipality in India?

(a) Chief Municipal Officer
(b) Chairman
(c) Mayor
(d) Municipal Commissioner

Q89. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements: Some hens are pigeons. All pigeons are crows. All crows are mynahs. Conclusions: (I) Some hens are mynahs. (II) Some mynahs are pigeons.

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

Q90. Suzanne Collins' novel published in 2025 is titled:

(a) Léon: The Professional
(b) The Crimson Rivers
(c) Sunrise on the Reaping
(d) Le Grand Bleu

Q91. Find a single discount (rounded up to two decimal places) equal to three consecutive discounts of 26%, 29% and 2%.

(a) 48.51%
(b) 48.86%
(c) 47.12%
(d) 47.56%

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Q92. Ramesh can complete a piece of work alone in 16 days and Suresh can complete the same piece of work alone in 10 days. They started the work together, but Ramesh had to leave 4 days before the completion of the work. In how many days will the work get completed?

(a) 79/13 days
(b) 72/13 days
(c) 78/13 days
(d) 75/13 days

Q93. If '+' means 'subtraction', '−' means 'multiplication', '×' means 'division' and '÷' means 'addition', then what will come in place of the question mark (?) in the following equation?

109 ÷ 76 × 4 − 5 + 18 = ?

(a) 189
(b) 201
(c) 186
(d) 191

Q94. R is the wife of A. F is the son of A. G is the sister of T. T is the brother of F. How is T related to R?

(a) Son
(b) Brother
(c) Brother's son
(d) Sister's son

Q95. What should come in place of the question mark (?) in the given series?

21 24 33 48 69 96 ?

(a) 141
(b) 129
(c) 116
(d) 138

Q96. Which of the following states is NOT covered by the Ganga Plain?

(a) Punjab
(b) Haryana
(c) West Bengal
(d) Bihar

Q97. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

215 ÷ 4 + 822 × 3 − 45 = ?

(a) 691
(b) 581
(c) 521
(d) 631

Q98. In a certain code language, 'LIFE' is coded as '4268' and 'FUND' is coded as '3527'. What is the code for 'F' in the given code language?

(a) 3
(b) 7
(c) 6
(d) 2

Q99. Which physiographic feature lies parallel to the Shiwaliks and is about 8-16 km wide?

(a) Delta
(b) Bhabar
(c) Terai
(d) Doab

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Q100. Which of the following architectures was built by Aurangzeb?

(a) Bibi-ka-Maqbara
(b) Qutub Minar
(c) Taj Mahal
(d) Humayun's tomb

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) 3

According to the given information,

Thus, 'E' is coded as '3'.

Hence, "Option 3" is the correct answer.

Q2. Answer: (d) Copper and aluminium

The correct answer is Copper and aluminium.

Key Points

• Copper is widely used in electrical transmission lines due to its excellent conductivity, durability, and resistance to corrosion.
• Aluminium is commonly used because it is lightweight, cost-effective, and has a high conductivity-to-weight ratio.
• Both metals are preferred in applications requiring efficient power transmission over long distances.
• Aluminium is often used in high-voltage transmission lines, while copper is preferred for lower-voltage applications and in areas where space is limited.
• Modern transmission cables often use aluminium core reinforced with steel (ACSR) to improve strength while maintaining conductivity.

Additional Information

• Electrical Conductivity:
• Copper has one of the highest electrical conductivity values among metals, second only to silver.
• Aluminium's conductivity is lower than copper but is still highly efficient for transmission purposes.
• Cost Considerations:
• Aluminium is significantly cheaper than copper, making it an economical choice for large-scale transmission projects.
• Copper, while more expensive, is used where higher performance and durability are required.
• Strength and Weight:
• Aluminium's lower density makes it lighter and easier to install in overhead transmission lines.
• Steel reinforcement in aluminium cables increases tensile strength for long-distance applications.
• Applications of Copper vs Aluminium:
• Copper is used in underground cables, electrical wiring, and machinery due to its compact nature and reliability.
• Aluminium is used in overhead lines, including long-distance power transmission and distribution networks.
• Environmental Aspect:

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• Both copper and aluminium are recyclable and contribute to sustainable energy systems.
• Efficient transmission reduces energy loss, making them critical for modern energy-efficient grids.

Q3. Answer: (c) 89

Shortcut Trick
Let P and Q be the present ages.
Equation 1: 4P − Q = 35 => Q = 4P − 35
Equation 2: 2(Q + 8) = 6(P + 8) − 40 => 2Q + 16 = 6P + 48 − 40 => 2Q = 6P − 8 => Q = 3P − 4
Equating Q: 4P − 35 = 3P − 4 => P = 31 years.
Put P in Q = 3(31) − 4 = 93 − 4 = 89 years.
Therefore The correct answer is 89 years.
Alternate Method
Given:
=> 4 × P = Q + 35 —— (i)
=> 2 × (Q + 8) = 6 × (P + 8) − 40 —— (ii)
From (i): Q = 4P − 35
Substitute Q in (ii):
=> 2(4P − 35 + 8) = 6P + 48 − 40
=> 2(4P − 27) = 6P + 8
=> 8P − 54 = 6P + 8
=> 2P = 62
=> P = 31 years
Now, find Q:
=> Q = 4(31) − 35 = 124 − 35 = 89 years
Therefore The correct answer is 89 years.
Additional Information
Linear Equations in Ages
Problems involving two variables are solved by forming two simultaneous equations based on past, present, or future conditions.
Age Ratio Constant
The difference between ages of two people remains constant regardless of the number of years passed or preceding.
Future and Past Ages
If present age is x, age after 'n' years is (x + n) and age 'n' years ago was (x − n).

Q4. Answer: (d) (3, 25, 4)

The logic followed here is:
(2, 20, 4)
22 + 42 = 20
4 + 16 = 20
20 = 20 (LHS = RHS)
And,
(5, 61, 6)
52 + 62 = 61
25 + 36 = 61
61 = 61 (LHS = RHS)
So, checking each option one by one:
Option 1) (1, 8, 3)
12 + 32 = 8
1 + 9 = 8
10 ≠ 8 (LHS ≠ RHS)
Option 2) (4, 40, 6)
42 + 42 = 40
16 + 36 = 40

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42 ≠ 40 (LHS ≠ RHS)

Option 3) (7, 45, 2)

72 + 22 = 45

49 + 4 = 45

55 ≠ 45 (LHS ≠ RHS)

Option 4) (3, 25, 4)

32 + 42 = 25

9 + 16 = 25

25 = 25 (LHS = RHS)

Thus, out of all '(3, 25, 4)' follows the same logic as given.

Hence, "Option 4" is the correct answer.

Q5. Answer: (b) 4/7

Shortcut Trick

For a quadratic equation to have equal roots, the condition is b2 = 4ac.

Here, a = 7, b = −4, and c = k.

=> (−4)2 = 4 × 7 × k

=> 16 = 28k

=> k = 16 / 28 = 4/7

Therefore The correct answer is 4/7.

Alternate Method

Given Equation: 7x2 − 4x + k = 0

The standard form of a quadratic equation is ax2 + bx + c = 0.

Comparing the given equation with the standard form, we get:

a = 7, b = −4, c = k

The condition for the equation to have equal roots is that the Discriminant (D) must be zero.

Formula Used: D = b2 − 4ac

=> D = (−4)2 − 4 × 7 × k = 0

=> 16 − 28k = 0

=> 28k = 16

=> k = 16 / 28

=> k = 4/7

The value of k that makes the roots of the equation equal is 4/7.

Therefore The correct answer is 4/7.

Additional Information

Nature of Roots

The nature of roots depends on the value of D: if D > 0, roots are real and distinct; if D = 0, roots are real and equal; if D < 0, roots are imaginary.

Discriminant Formula

For any quadratic equation ax2 + bx + c = 0, the discriminant is calculated as D = b2 − 4ac.

Sum and Product of Roots

For the equation ax2 + bx + c = 0, the sum of roots is −b/a and the product of roots is c/a.

Q6. Answer: (a) Only 1, 2 and 4

The correct answer is Only 1, 2 and 4.

Key Points

• BJP retained power in the 2024 Haryana Assembly elections with a clear majority, continuing its governance from the previous term.

• The BJP increased its seat count compared to the 2019 Assembly elections, showcasing strengthened voter support.

• The vote share difference between BJP and Congress was narrow, with BJP securing 39.94% and Congress 39.09%, indicating a closely contested election.

• The Congress did not see a decrease in its seat count, maintaining or slightly improving its position compared to 2019, contrary to some claims.

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Additional Information

• Haryana Assembly Elections:

• The Haryana Legislative Assembly consists of 90 seats, and a party/alliance needs at least 46 seats to form a majority government.

• Major parties in the state include BJP, Congress, and regional entities such as the Jannayak Janta Party (JJP).

• Voting Trends in Haryana:

• Haryana has historically shown a mix of national party dominance and strong regional influences.

• The state often witnesses a close contest between BJP and Congress, with smaller parties playing kingmaker roles.

• Vote Share Dynamics:

• A narrow vote share gap, such as the one seen in 2024, highlights the competitive political landscape in Haryana.

• Such outcomes suggest that even small shifts in voter preferences can significantly alter seat distributions.

• Factors Influencing Haryana Elections:

• Key issues include agriculture, unemployment, education, and regional development.

• Caste dynamics play a critical role in shaping voter behavior in Haryana.

Q7. Answer: (b) 1,500

Shortcut Trick

Rate = 12.5% per annum, Time = 2 years

Total Interest % = 12.5% × 2 = 25%

Total Amount % = 100% (Principal) + 25% (Interest) = 125%

Given: 125% = Rs. 7,500

=> 25% (Simple Interest) = (7,500 ÷ 125) × 25 = 7,500 ÷ 5 = Rs. 1,500

Therefore The correct answer is Rs. 1,500.

Alternate Method

Given: Amount (A) = Rs. 7,500, Rate (R) = 12.5%, Time (T) = 2 years

Formula Used: Amount (A) = Principal (P) + Simple Interest (SI); SI = (P × R × T) ÷ 100

=> Let the Principal be P.

=> Simple Interest (SI) = (P × 12.5 × 2) ÷ 100 = 25P ÷ 100 = P ÷ 4

=> Amount = Principal + SI = P + (P ÷ 4) = 5P ÷ 4

=> 7,500 = 5P ÷ 4

=> P = (7,500 × 4) ÷ 5

=> P = 1,500 × 4 = 6,000

=> Simple Interest = Amount − Principal = 7,500 − 6,000 = 1,500

Therefore The correct answer is Rs. 1,500.

Additional Information

Basic Simple Interest Formula

SI = (P × R × T) ÷ 100. Interest remains constant for every year in simple interest.

Amount Calculation

Amount (A) = Principal (P) + Simple Interest (SI). It represents the total value after the investment period.

Effective Percentage Method

Effective Rate % = R × T. Total Amount % = 100 + (R × T). This is the fastest way to solve SI problems without variables.

Q8. Answer: (a) Tripura

The correct answer is Tripura.

Key Points

• According to the Periodic Labour Force Survey (PLFS) 2022-23, Tripura recorded the lowest unemployment rate among all Indian states.

• The unemployment rate in Tripura was just 1.4%, reflecting its robust industrial and economic ecosystem.

Additional Information

• Periodic Labour Force Survey (PLFS)

• Launched by the National Statistical Office (NSO) in 2022-23, PLFS aims to provide annual and quarterly estimates of key employment and unemployment indicators.

• It covers rural and urban areas, focusing on the labor market's dynamics and trends.

• The survey uses indicators such as the Worker Population Ratio (WPR), Labour Force Participation Rate (LFPR), and Unemployment Rate (UR).

• Unemployment Rate

• It is defined as the percentage of persons in the labor force who are unemployed and actively seeking work.

• Low unemployment rates indicate a healthy labor market and economic stability.

• Other States with Low Unemployment Rates

• According to PLFS 2022-23, states like Karnataka and Maharashtra also reported low unemployment rates due to their strong industrial and service sectors.

Q9. Answer: (d) Gopal Ganesh Agarkar

The correct answer is Gopal Ganesh Agarkar.

Key Points

• Gopal Ganesh Agarkar was a radical rationalist and social reformer from Maharashtra who strongly opposed orthodox traditions and superstitions.

• He was a co-founder of the Deccan Education Society and the first editor of the Marathi newspaper ‘Kesari’, later founding his own paper, ‘Sudharak’, to promote rationalist views.

• Agarkar advocated for education, women's rights, and the eradication of caste discrimination in society, aligning with radical reformist ideologies.

• He was critical of religious orthodoxy and promoted scientific temper and rational thinking, challenging societal norms during the late 19th century.

• Despite his close association with Bal Gangadhar Tilak, Agarkar held contrasting views on social reform versus political activism, emphasizing social change over political independence.

Additional Information

• Radical Rationalism:

• It is a philosophical and social reform approach emphasizing reasoning, evidence-based thinking, and scientific temper.

• Radical rationalists often challenge traditional beliefs, superstitions, and practices that lack logical or empirical support.

• Deccan Education Society:

• Founded in 1884 by Gopal Ganesh Agarkar, Bal Gangadhar Tilak, and others, it aimed to provide quality education with a focus on Indian culture and values.

• The society established prestigious institutions like Fergusson College in Pune.

• Sudharak Newspaper:

• A Marathi newspaper founded by Agarkar to propagate his ideas on rationalism, social reform, and scientific thinking.

• It was instrumental in critiquing orthodox practices and promoting progressive ideologies.

• Debates with Tilak:

• Agarkar and Tilak had ideological differences, with Agarkar focusing on social reform and Tilak on political independence.

• These debates highlighted the contrasting priorities within the Indian freedom movement during the late 19th century.

Q10. Answer: (d) $(36x^2 + 256y^2 + 100 + 192xy + 320y + 120x)$ m²

Shortcut Trick

Area of four walls of a cube (Lateral Surface Area) = 4 × (side)².

Given side a = (3x + 8y + 5).

Using identity $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$.

$4 \times [(3x)^2 + (8y)^2 + (5)^2 + 2(3x)(8y) + 2(8y)(5) + 2(5)(3x)]$

$4 \times [9x^2 + 64y^2 + 25 + 48xy + 80y + 30x] = 36x^2 + 256y^2 + 100 + 192xy + 320y + 120x$.

Therefore The correct answer is $(36x^2 + 256y^2 + 100 + 192xy + 320y + 120x)$ m².

Alternate Method

Given: Edge of the cube (a) = (3x + 8y + 5) m.

Formula Used: Area of four walls (LSA) = $4a^2$.

$\Rightarrow$ Area = $4 \times (3x + 8y + 5)^2$

$\Rightarrow$ Area = $4 \times [(3x)^2 + (8y)^2 + (5)^2 + 2(3x)(8y) + 2(8y)(5) + 2(5)(3x)]$

$\Rightarrow$ Area = $4 \times [9x^2 + 64y^2 + 25 + 48xy + 80y + 30x]$

$\Rightarrow$ Area = $(4 \times 9x^2) + (4 \times 64y^2) + (4 \times 25) + (4 \times 48xy) + (4 \times 80y) + (4 \times 30x)$

$\Rightarrow$ Area = $36x^2 + 256y^2 + 100 + 192xy + 320y + 120x$

Therefore The correct answer is $(36x^2 + 256y^2 + 100 + 192xy + 320y + 120x)$ m².

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Additional Information

Total Surface Area of Cube

The total surface area includes all six faces and is given by $6a^2$, where a is the edge length.

Volume of Cube

The space occupied by the cube is calculated using the formula $V = a^3$.

Algebraic Identity

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$ is essential for expanding polynomial side lengths.

Q11. Answer: (a) 46/3

Shortcut Trick

Identify the Pythagorean triplet for sin A = 4/5 → (3, 4, 5).

Here, Perpendicular (P) = 4, Hypotenuse (H) = 5, and Base (B) = 3.

Calculate required ratios: tan A = P/B = 4/3 and cos A = B/H = 3/5.

Substitute in expression: (2 + 4/3) × (4 + 3/5) = (10/3) × (23/5) = 46/3.

Therefore The correct answer is 46/3.

Alternate Method

Given: sin A = 4/5

Formula Used: sin A = P/H, cos A = B/H, tan A = P/B, where $B = \sqrt{(H^2 - P^2)}$

=> $B = \sqrt{(5^2 - 4^2)} = \sqrt{(25 - 16)} = \sqrt{9} = 3$

=> tan A = 4/3

=> cos A = 3/5

=> Value = (2 + tan A)(4 + cos A)

=> Value = (2 + 4/3) × (4 + 3/5)

=> Value = (10/3) × (23/5)

=> Value = 230/15 = 46/3

Therefore The correct answer is 46/3.

Additional Information

Trigonometric Identities

Fundamental relations include $\sin^2A + \cos^2A = 1$ and tan A = sin A / cos A.

Common Pythagorean Triplets

Frequently used sets in exams: (3, 4, 5), (5, 12, 13), (7, 24, 25), and (8, 15, 17).

Q12. Answer: (b) London, United Kingdom

The correct answer is London, United Kingdom.

Key Points

• The International Summit on the Future of Energy Security was held in London, United Kingdom, in April 2025.

• The summit brought together leaders, policymakers, and experts to discuss the global challenges and solutions related to energy security and sustainability.

• Key topics included renewable energy integration, reducing dependency on fossil fuels, and fostering international cooperation for energy resilience.

• This high-profile event aimed to establish a roadmap for achieving net-zero emissions while ensuring reliable and affordable energy access globally.

• The summit underscored the role of technological innovation and public-private partnerships in addressing energy security challenges.

Additional Information

• Energy Security:

• Energy security refers to the uninterrupted availability of energy sources at an affordable price.

• It encompasses both long-term strategies (ensuring sustainable energy supplies) and short-term measures (addressing sudden disruptions in energy supplies).

• Net-Zero Emissions:

• Net-zero emissions mean achieving a balance between the greenhouse gases emitted into the atmosphere and those removed from it.

• It is a critical target to limit global warming to 1.5°C as per the Paris Agreement.

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• Renewable Energy:
• Renewable energy sources include solar, wind, hydro, geothermal, and biomass.
• They are vital for reducing carbon footprints and ensuring sustainable energy systems.
• Public-Private Partnerships (PPP):
• PPP refers to collaborations between government entities and private sector companies to deliver infrastructure projects or services.
• In the energy sector, PPPs play a crucial role in funding and implementing renewable energy projects.
• Global Energy Challenges:
• Challenges include dependence on non-renewable energy sources, geopolitical tensions, and climate change impacts.
• Developing energy-efficient technologies and diversifying energy sources are key to overcoming these hurdles.

Q13. Answer: (d) Brahmaputra

The correct answer is Brahmaputra.

Key Points

• The Brahmaputra River is renowned for forming deep gorges in the Himalayan region, especially in Arunachal Pradesh and Tibet.
• The Yarlung Tsangpo Grand Canyon, carved by the Brahmaputra in Tibet, is the world's deepest gorge.
• In Arunachal Pradesh, the Brahmaputra flows through a gorge near the Namcha Barwa mountain, creating a dramatic landscape.
• These gorges are formed due to the river's high velocity and the steep gradient of the Himalayas.
• The Brahmaputra is one of the major transboundary rivers, originating from the Angsi Glacier in Tibet and flowing through India and Bangladesh.

Additional Information

• Gorge Formation:
• A gorge is a deep valley with steep sides, often formed by rivers cutting through resistant rock layers.
• In the Himalayan region, rapid tectonic uplift combined with river erosion contributes to gorge formation.
• Himalayan Rivers:
• Himalayan rivers like the Indus, Ganga, and Brahmaputra are perennial, fed by glaciers and monsoon rains.
• These rivers often exhibit erosional features like gorges, waterfalls, and rapids.
• Transboundary Rivers:
• The Brahmaputra is a transboundary river, flowing through Tibet (China), India, and Bangladesh.
• It plays a crucial role in irrigation, hydropower, and biodiversity in its basin regions.
• Yarlung Tsangpo River:
• In Tibet, the Brahmaputra is known as the Yarlung Tsangpo.
• It originates near Mount Kailash and is an important river in the Tibetan Plateau.

Q14. Answer: (b) 3

Given series: (Left) 8 9 # 1 9 © 3 5 © € @ # £ @ * © 5 £ € 5 4 4 (Right)

According to the question,

Required condition: Number - Number - Symbol

(Left) 8 9 # 1 9 © 3 5 © € @ # £ @ * © 5 £ € 5 4 4 (Right)

Thus, there are three such numbers which are immediately preceded by a number and also immediately followed by a symbol.

Hence, "Option 2" is the correct answer.

Q15. Answer: (a) TW-RU-PS

The logic followed here is:

QT-OR-MP

And,

XA-VY-TW

Similarly,

Option 1) TW-RU-PS

Hence, "Option 1" is the correct answer.

Q16. Answer: (a) 651

Given: 187 ÷ 3 + 168 × 2 − 174 = ?

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

187 ÷ 3 + 168 × 2 − 174 = ? => 187 × 3 - 168 ÷ 2 + 174 = ?

=> 187 × 3 - 168 ÷ 2 + 174 = ?

=> 187 × 3 - 84 + 174 = ?

=> 561 + 174 - 84 = ?

=> 735 - 84 = ?

=> 651 = ?

Hence, "Option 1" is the correct answer.

Q17. Answer: (a) QFL

The logic followed here is:

Hence, "Option 1" is the correct answer.

Q18. Answer: (a) To convert minor offenses under various laws from criminal to civil penalties

The correct answer is To convert minor offenses under various laws from criminal to civil penalties.

Key Points

• The Jan Vishwas (Amendment of Provisions) Act, 2023, aims to promote ease of business by reducing compliance burdens.

• It seeks to convert minor offenses under 42 legislations from criminal offenses to civil penalties, fostering a business-friendly environment.

• The law aims to decriminalize petty offenses across various domains, including trade, commerce, and industry.

• By reducing criminal penalties for minor infractions, the Act encourages entrepreneurship and reduces fear of legal repercussions for small errors.

• The Act aligns with the government's broader agenda of improving India's ranking in the Ease of Doing Business index.

Additional Information

• Decriminalization of Offenses:

• Decriminalization involves removing criminal penalties for certain acts, replacing them with civil penalties or administrative actions.

• This approach is used to reduce the burden on the judiciary and improve compliance without harsh legal consequences.

• Ease of Doing Business:

• India has been working to improve its Ease of Doing Business ranking globally, focusing on streamlining regulations and reducing barriers for businesses.

• Measures like decriminalization of minor offenses are integral to achieving this goal.

• Impact on Business Ecosystem:

• By converting criminal penalties to civil penalties, businesses can avoid lengthy legal disputes and focus on growth.

• This reform benefits startups and small enterprises, encouraging innovation and entrepreneurship.

• Legislative Scope:

• The Jan Vishwas Act amends 42 laws, including regulations related to environment, labor, and consumer protection.

• It ensures uniformity in penalties and simplifies compliance frameworks across sectors.

Q19. Answer: (a) = DNU, % = SHT

The logic followed here is:

Given: # : EPV :: RFS : %

Option 1) # = DNU, % = SHT → DNU : EPV :: RFS : SHT

Option 2) # = CNU, % = THV → CNU : EPV :: RFS : THV

Option 3) # = COW, % = SGQ → COW : EPV :: RFS : SGQ

Option 4) # = DMU, % = SGL → DMU : EPV :: RFS : SGL

Hence, "Option 1" is the correct answer.

Q20. Answer: (a) AMRUT

The correct answer is AMRUT.

Key Points

• Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched in June 2015 by the Government of India to improve urban infrastructure.

• The mission focuses on providing basic services such as water supply, sewerage, urban transport, and green spaces to improve urban living standards.

• AMRUT follows a decentralized approach, empowering states and urban local bodies (ULBs) to plan and execute projects.

• The scheme aims to ensure universal coverage of water supply and sewerage services in all urban areas.

• Under AMRUT 2.0, launched in October 2021, the focus expanded to achieving water sustainability and promoting circular economy practices in urban areas.

Additional Information

• Smart Cities Mission

• Launched in 2015, this mission focuses on creating 100 smart cities across India by improving urban infrastructure and integrating technology.

• It aims at promoting sustainable and inclusive cities that provide core infrastructure and quality of life to its citizens.

• Key focus areas include smart mobility, smart governance, and smart energy.

• Pradhan Mantri Awas Yojana - Urban (PMAY-U)

• Launched in 2015, this scheme focuses on providing affordable housing to urban poor by 2022.

• It includes the Credit-Linked Subsidy Scheme (CLSS) for home loans and in-situ slum redevelopment projects.

• The scheme addresses housing shortages for Economically Weaker Sections (EWS), Low Income Groups (LIG), and Middle Income Groups (MIG).

• RURBAN Mission

• Also known as the Shyama Prasad Mukherji Rurban Mission, it was launched in 2016 to develop rural areas by providing urban amenities.

• The mission aims to create rurban clusters by combining urban infrastructure with rural characteristics to promote balanced regional development.

• MGNREGA

• The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) focuses on providing employment opportunities in rural areas.

• It guarantees 100 days of wage employment to rural households annually.

Q21. Answer: (b) 7986

Shortcut Trick

For a number to be divisible by 22, it must be divisible by 2 and 11.

Check even numbers only (divisible by 2): Options (2) 7986 and (3) 7664.

Check divisibility by 11 for 7986: (7 + 8) − (9 + 6) = 15 − 15 = 0.

Since the difference is 0, the number is divisible by 11.

Therefore The correct answer is 7986.

Alternate Method

Given: Numbers 7019, 7986, 7664, 8371. Check divisibility by 22.

Condition: Divisible by 2 (last digit even) AND divisible by 11 (difference of sum of digits at odd and even places is 0 or multiple of 11).

=> Step 1: Eliminate odd numbers 7019 and 8371 (not divisible by 2).

=> Step 2: Test 7986 for 11: Sum of odd positions (7+8=15), Sum of even positions (9+6=15). Difference = 15 − 15 = 0.

=> Step 3: Test 7664 for 11: Sum of odd positions (7+6=13), Sum of even positions (6+4=10). Difference = 13 − 10 = 3 (not divisible by 11).

=> Conclusion: Only 7986 satisfies both conditions.

Therefore The correct answer is 7986.

Additional Information

Divisibility Rule of 11

A number is divisible by 11 if the absolute difference between the sum of digits at odd places and even places is 0 or a multiple of 11.

Divisibility of Composite Numbers

To check divisibility by a composite number like 22, check divisibility by its co-prime factors (2 and 11).

Divisibility by 2

Any number ending with an even digit (0, 2, 4, 6, 8) is divisible by 2.

Q22. Answer: (a) 382

The logic followed here is:

Hence, "Option 1" is the correct answer.

Q23. Answer: (c) Art

The correct answer is Art.

Key Points

• Sharda Sinha is a renowned Indian folk singer, primarily known for her contributions to the Bhojpuri and Maithili music traditions.

• She was awarded the Padma Vibhushan posthumously in 2025 for her exceptional contributions to Indian art, particularly folk music.

• Her songs are deeply rooted in the cultural heritage of Bihar and Uttar Pradesh, making her a prominent figure in preserving and promoting regional music.

• Sharda Sinha's work gained national recognition through her performances in Bollywood movies like "Maine Pyar Kiya," where she sang the famous track "Kahe Toh Se Sajna."

• Her significant impact on Indian art and music earned her prestigious awards, including the Padma Shri in 1991 and Padma Bhushan in 2018.

Additional Information

• Padma Awards:

• Padma Awards are among the highest civilian honors in India, instituted in 1954.

• They are categorized into three levels: Padma Shri (distinguished service), Padma Bhushan (distinguished service of high order), and Padma Vibhushan (exceptional and distinguished service).

• These awards are given in various fields such as art, literature, science, and public service.

• Folk Music in India:

• Indian folk music is a reflection of the country's cultural diversity and regional traditions.

• Folk music often represents stories, traditions, and daily life of specific communities.

• It plays a vital role in preserving India’s intangible cultural heritage.

• Bollywood and Folk Music:

• Bollywood films have often incorporated folk music to bring authenticity and cultural depth to their stories.

• Artists like Sharda Sinha have bridged the gap between traditional and mainstream music.

• Such collaborations have helped popularize regional music on a national and global scale.

• Bhojpuri and Maithili Music:

• Bhojpuri and Maithili music are traditional genres originating from Bihar and Uttar Pradesh.

• These forms of music often include devotional songs, wedding songs, and festive melodies.

• Sharda Sinha is celebrated for her role in reviving and modernizing these music traditions.

Q24. Answer: (b) Imposing fines on offenders

The correct answer is Imposing fines on offenders.

Key Points

• Nyaya Panchayats are judicial bodies established in rural areas of India to resolve local disputes and maintain harmony.

• They have the authority to impose fines on offenders as a corrective and punitive measure in civil and minor criminal cases.

• These fines act as a deterrent while ensuring justice is served without escalating disputes to higher courts.

• The jurisdiction of Nyaya Panchayats is generally limited to cases of minor disputes, including petty thefts, minor assaults, and simple civil disagreements.

• They play a crucial role in delivering speedy and cost-effective justice in rural India.

Additional Information

• Nyaya Panchayat:

• It is a village-level judicial system established under the Gram Panchayat Act in various states of India.

• It is a decentralized system aimed at reducing the burden on regular courts and improving access to justice in rural areas.

• Jurisdiction:

• Nyaya Panchayats handle cases involving disputes related to property, breach of contract, and family matters.

• They have no jurisdiction over cases involving serious crimes or disputes requiring extensive legal expertise.

• Limitations:

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• They do not have the authority to imprison offenders but can impose fines or other penalties within their prescribed limits.
• They function under the supervision of higher judicial authorities to ensure fairness and legality.
• Significance:
• Nyaya Panchayats promote localized and participatory governance by involving community members in dispute resolution.
• They play a vital role in reducing litigation costs and ensuring justice is accessible to rural populations.

Q25. Answer: (b) 26

Shortcut Trick

Area of a quadrilateral with diagonal AC and perpendiculars h1 and h2 is given by: Area = 1/2 × AC × (h1 + h2).

299 = 1/2 × AC × (11 + 12)

299 = 1/2 × AC × 23

AC = (299 × 2) ÷ 23

AC = 13 × 2 = 26 cm.

Therefore The correct answer is 26 cm.

Alternate Method

Given:

Area of quadrilateral ABCD = 299 cm^2

Perpendicular from vertex B to AC (h1) = 11 cm

Perpendicular from vertex D to AC (h2) = 12 cm

Formula Used:

Total Area = Area(ΔABC) + Area(ΔADC) = 1/2 × Base × Height1 + 1/2 × Base × Height2

Calculations:

=> Area(ABCD) = 1/2 × AC × (h1 + h2)

=> 299 = 1/2 × AC × (11 + 12)

=> 299 = 1/2 × AC × 23

=> 299 × 2 = 23 × AC

=> 598 = 23 × AC

=> AC = 598 ÷ 23

=> AC = 26 cm

Therefore The correct answer is 26 cm.

Additional Information

Area of a General Quadrilateral

For any quadrilateral with a diagonal d and perpendiculars p1 and p2 dropped from opposite vertices, Area = 1/2 × d × (p1 + p2).

Area of Rhombus

If the diagonals d1 and d2 are perpendicular (as in a rhombus or square), Area = 1/2 × d1 × d2.

Area of Trapezium

Area = 1/2 × (sum of parallel sides) × height, where height is the distance between the parallel lines.

Q26. Answer: (a) India and Pakistan

The correct answer is India and Pakistan.

Key Points

• The Thar Desert, also known as the Great Indian Desert, serves as a natural geographical boundary between India and Pakistan.
• It is located primarily in the Indian state of Rajasthan, with smaller portions extending into Gujarat, Punjab, and Haryana, as well as parts of Pakistan's Sindh province.
• The desert spans approximately 200,000 square kilometers, making it the 17th largest desert in the world.
• The Thar Desert is characterized by its arid climate, vast sand dunes, and sparse vegetation, playing a crucial role in shaping the geography and culture of the region.
• The boundary formed by the Thar Desert has historically influenced cross-border trade, migration, and geopolitical relations between India and Pakistan.

Additional Information

• Geographical Features of the Thar Desert:
• The Thar Desert consists of shifting sand dunes, rocky terrain, and saline lakes.

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• It is primarily fed by the monsoon rains, receiving an annual rainfall of about 100-500 mm.
• Prominent rivers such as the Luni River flow through the desert region.
• Climate and Biodiversity:
• The Thar Desert experiences an extreme climate, with temperatures ranging from 0°C in winter to 50°C in summer.
• The desert is home to unique flora and fauna, including species like the Indian gazelle (Chinkara), desert fox, and various reptiles.
• Economic and Cultural Importance:
• The desert supports agriculture and animal husbandry, particularly camel rearing, which is vital for transportation and livelihood.
• It is rich in minerals such as gypsum, bentonite, and limestone, contributing to India's mining sector.
• Cultural festivals like the Desert Festival of Jaisalmer attract tourists and celebrate the heritage of the region.
• Border Relations:
• The Thar Desert serves as a natural barrier in the India-Pakistan border region, limiting military movement in certain areas.
• Several border posts and fences have been established along the desert to enhance security and monitor cross-border activities.

Q27. Answer: (a) 20,174

Shortcut Trick

Let the cost of production be x.

Successive selling: x × (110 ÷ 100) × (115 ÷ 100) × (125 ÷ 100) = 31,900.

Using multiplier: x × 1.1 × 1.15 × 1.25 = 31,900.

x = 31,900 ÷ (1.1 × 1.15 × 1.25) ≈ 20,173.91.

Rounding to the nearest integer, we get 20,174.

Therefore The correct answer is Rs. 20,174.

Alternate Method

Given → Retail Price = Rs. 31,900, Manufacturer Gain = 10%, Wholesaler Gain = 15%, Retailer Gain = 25%.

Formulas: SP = CP × (100 + Gain%) ÷ 100 | Production Cost = Final Price × [100 ÷ (100 + r1)] × [100 ÷ (100 + r2)] × [100 ÷ (100 + r3)].

=> Let Production Cost be P.

=> P × (110 ÷ 100) × (115 ÷ 100) × (125 ÷ 100) = 31,900.

=> P × (11 ÷ 10) × (23 ÷ 20) × (5 ÷ 4) = 31,900.

=> P × (1265 ÷ 800) = 31,900.

=> P = (31,900 × 800) ÷ 1,265.

=> P = 25,520,000 ÷ 1,265 ≈ 20,173.91.

Therefore The correct answer is Rs. 20,174.

Additional Information

Chain of Profit

When a product passes through multiple hands, the final price is the result of successive percentage increases on the initial cost.

Successive Percentage Formula

Total Effective Gain % = [(1 + r1 ÷ 100)(1 + r2 ÷ 100)(1 + r3 ÷ 100) − 1] × 100.

Q28. Answer: (d) 79 km towards the east

Given:

Chetan starts from Point Y and drives 37 km towards the south.

He then takes a right turn, drives 18 km, turns right and drives 58 km.

He then takes a left turn and drives 61 km.

He takes a left turn, drives 21 km and stops at Point Z.

Thus, Chetan should drive 79 km in the east direction in order to reach Point Y again.

Hence, "Option 4" is the correct answer.

Q29. Answer: (b) 87 : 245

Shortcut Trick

For proportions a : b :: c : d, the product of extremes equals the product of means: ad = bc.

From 7 : 14 :: 8.7 : x => x = (14 × 8.7) ÷ 7 = 2 × 8.7 = 17.4.

From 5 : 35 :: 7 : y => y = (35 × 7) ÷ 5 = 7 × 7 = 49.

Ratio x : y = 17.4 : 49 = 174 : 490 = 87 : 245.

Therefore The correct answer is 87 : 245.

Alternate Method

Given: 7 : 14 :: 8.7 : x and 5 : 35 :: 7 : y

Formula Used: If a : b :: c : d, then a/b = c/d

Calculations:

=> 7 / 14 = 8.7 / x

=> 1 / 2 = 8.7 / x => x = 8.7 × 2 = 17.4

=> 5 / 35 = 7 / y

=> 1 / 7 = 7 / y => y = 7 × 7 = 49

=> Ratio x : y = 17.4 : 49

=> Ratio x : y = 174 / 490 = 87 / 245

Therefore The correct answer is 87 : 245.

Additional Information

Fourth Proportional

The fourth proportional 'd' to three numbers a, b, and c is given by d = (b × c) ÷ a.

Mean Proportional

The mean proportional between two numbers 'a' and 'b' is given by x = √(a × b).

Continued Proportion

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

Q30. Answer: (b) 220

Shortcut Trick

Calculate Cumulative Frequency (cf): 10, 22, 40, 60, 80.

Total frequency N = 80, so N/2 = 40.

Since the cumulative frequency of the class 200−220 is exactly 40 (N/2), the Median is the upper limit of this class.

Therefore The correct answer is 220.

Alternate Method

Given Data:

Class Intervals: 160−180, 180−200, 200−220, 220−240, 240−260

Frequencies (f): 10, 12, 18, 20, 20

Formula Used:

Median = L + [(N/2 − cf_p) / f_m] × h

Where L = Lower limit of median class, N = Total frequency, cf_p = Cumulative frequency of preceding class, f_m = Frequency of median class, h = Class width.

Calculations:

=> Cumulative Frequencies: 10, 22, 40, 60, 80

=> Total Frequency N = 80

=> N/2 = 80 / 2 = 40

=> The cumulative frequency just greater than or equal to 40 is 40, which belongs to class 200−220.

=> L = 200, cf_p = 22, f_m = 18, h = 20

=> Median = 200 + [(40 − 22) / 18] × 20

=> Median = 200 + [18 / 18] × 20

=> Median = 200 + 20 = 220

Therefore The correct answer is 220.

Additional Information

Empirical Relationship

The relationship between Mean, Median, and Mode is: Mode = 3 × Median − 2 × Mean.

Median for Grouped Data

Median is the value that divides the data into two equal halves. For grouped data, it is calculated using the interpolation formula based on the Median Class.

Mean of Grouped Data

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Mean (μ) = Σ(f_i × x_i) / Σf_i, where x_i is the class mark (mid-point) of each interval.

Q31. Answer: (a) 49

Shortcut Trick

Arrange the 11 observations in ascending order: 24, 26, 38, 39, 43, 49, 60, 61, 62, 72, 95.

Since the number of observations (N = 11) is odd, the median is the exact middle term.

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

The 6^(th) term in the sorted list is 49.

Therefore The correct answer is 49.

Alternate Method

Given:

Observations: 60, 43, 24, 61, 72, 26, 39, 62, 49, 95, 38

Total number of observations (N) = 11

Formula Used:

When N is odd:

Median = ((N + 1) ÷ 2)^(th) observation (after arranging in ascending order).

Calculations:

Arrange the given data in ascending order:

=> 24, 26, 38, 39, 43, 49, 60, 61, 62, 72, 95

Here, N = 11 (which is an odd number).

=> Median = ((11 + 1) ÷ 2)^(th) term

=> Median = (12 ÷ 2)^(th) term

=> Median = 6^(th) term

=> 6^(th) term = 49

Thus, the median of the given observations is 49.

Explanation of incorrect options:

=> Option (2) 43 is the 5^(th) term, which is not the exact middle term.

=> Option (3) 60 is the 7^(th) term, which is not the exact middle term.

=> Option (4) 62 is the 9^(th) term, which is not the exact middle term.

Therefore The correct answer is 49.

Additional Information

Median for Even Number of Observations

If the number of observations (N) is even, the median is the average of the (N ÷ 2)^(th) and ((N ÷ 2) + 1)^(th) terms. Formula: Median = [(N/2)^(th) term + (N/2 + 1)^(th) term] ÷ 2.

Empirical Relationship between Mean, Median, and Mode

For a moderately skewed distribution, the relationship is given by: Mode = 3 × Median − 2 × Mean.

Robustness of Median

The median is a robust measure of central tendency because it is not influenced by extreme values or outliers in the dataset.

Q32. Answer: (d) Shipra

Given: Prabhat, Dinesh, Yug, Monu, Sakshi, Amit and Shipra are sitting around a circular table, facing the centre.

1) Yug sits second to the left of Amit.

2) Prabhat sits third to the right of Amit.

3) Monu sits to the immediate right of Dinesh.

4) Shipra is not an immediate neighbour of Prabhat.

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

Thus, Shipra sits second to the left of Dinesh.

Hence, "Option 4" is the correct answer.

Q33. Answer: (a) Kurnool

The correct answer is Kurnool.

Key Points

• The field demonstration of the Directed Energy Weapon (DEW) Mk-II(A) system by DRDO was conducted at Kurnool in 2025.

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• DEW systems use highly focused energy, such as lasers or microwaves, to disable or destroy targets without the use of traditional projectiles.

• The test was carried out under the supervision of India's Defence Research and Development Organisation (DRDO), which is actively developing advanced technologies for national defense.

• Kurnool, located in Andhra Pradesh, has been a site for various defense-related tests due to its favorable geographic and infrastructure conditions.

• The successful demonstration marked a significant milestone in India’s defense capabilities, showcasing advancements in energy-based weapon systems.

Additional Information

• Directed Energy Weapons (DEWs):

• DEWs use focused energy to damage or destroy enemy equipment, personnel, or facilities.

• Examples include high-energy lasers, high-power microwaves, and particle beams.

• These systems offer precision targeting, reduced collateral damage, and low operational costs compared to traditional weapons.

• DRDO (Defence Research and Development Organisation):

• India's premier defense R&D organization, established in 1958.

• It works on developing state-of-the-art weapon systems and technologies for the Indian Armed Forces.

• Major projects include missiles, radars, fighter aircraft, and advanced weapon systems like DEWs.

• Kurnool as a Defense Testing Site:

• Kurnool in Andhra Pradesh has been a preferred location for defense tests due to its strategic location and vast open areas.

• It has hosted several missile and weapon system trials in the past.

• Importance of DEWs:

• DEWs are considered the future of modern warfare, enabling stealth attacks and countering aerial threats like drones and missiles.

• They are environmentally safer, as they avoid explosive materials and toxic by-products.

Q34. Answer: (d) Rs. 27,500

Shortcut Trick

For a period of 2 years, the difference between Compound Interest and Simple Interest is given by the formula: Difference = P × (R/100)².

Given Difference = Rs. 44 and Rate (R) = 4%.

=> 44 = P × (4/100)²

=> 44 = P × (1/25)² => 44 = P ÷ 625

=> P = 44 × 625 = Rs. 27,500

Therefore The correct answer is Rs. 27,500.

Alternate Method

Given:

Time (T) = 2 years

Rate (R) = 4% per annum

Difference (CI − SI) = Rs. 44

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Compound Interest (CI) = P[(1 + R/100)^T − 1]

Calculations:

=> Let the Principal be P.

=> SI = (P × 4 × 2) ÷ 100 = 0.08P

=> CI = P[(1 + 4/100)² − 1]

=> CI = P[(1.04)² − 1] = P[1.0816 − 1] = 0.0816P

=> Difference = CI − SI = 0.0816P − 0.08P = 0.0016P

=> 0.0016P = 44

=> P = 44 ÷ 0.0016 = 440,000 ÷ 16

=> P = Rs. 27,500

Therefore The correct answer is Rs. 27,500.

Additional Information

Difference for 3 Years

The difference between CI and SI for 3 years is given by: Difference = $P(R/100)^2 \times (3 + R/100)$.

Effective Rate of Interest

For 2 years at R%, the effective CI rate is $(R + R + R^2/100)\%$, while the SI rate is simply $(2R)\%$.

Rule of 72

A quick way to estimate the time to double an investment: Time ≈ 72 ÷ Interest Rate.

Q35. Answer: (b) 8

Given: (Left) 941 915 741 807 776 (Right)

According to the question:

Given numbers	941	915	741	807	776
Number are arranged in ascending order	741	776	807	915	941

So,

Third digit of the highest number → 941 → 1

First digit of the lowest number → 741 → 7

Thus, if the third digit of the highest number is added to the first digit of the lowest number then the resultant will be → 1 + 7 → 8

Hence, "Option 2" is the correct answer.

Q36. Answer: (a) 3

Given:

Find the value of √(0.038025) ÷ √(0.004225)

Formula used:

√(a) ÷ √(b) = √(a ÷ b)

Calculations:

=> √(0.038025) ÷ √(0.004225) = √(0.038025 ÷ 0.004225)

=> = √(38025 ÷ 4225) (multiplied both by 1,000,000)

=> $38025 = 195^2$, $4225 = 65^2$

=> √(38025 ÷ 4225) = √((195²) ÷ (65²))

=> = 195 ÷ 65 = 3

Therefore Value = 3

Q37. Answer: (a) 1

According to the given information,

Thus, 'T' is coded as '1'.

Hence, "Option 1" is the correct answer.

Q38. Answer: (d) Tadaga

The correct answer is Tadaga.

Key Points

• The term "Tadaga" was used in Gupta-era inscriptions and records to refer to tanks or ponds.

• These tanks or ponds were constructed for irrigation, water conservation, and public utility purposes.

• The Gupta period is known for its advancements in agricultural infrastructure, including the creation of water storage systems like Tadaga.

• Such water bodies were often associated with religious and social activities, highlighting the cultural significance of water management during the Gupta era.

• Gupta inscriptions also mention the donation of tanks and ponds by wealthy individuals or rulers for the welfare of society.

Additional Information

• Gupta Dynasty

• The Gupta Empire (circa 320–550 CE) is often referred to as the Golden Age of India due to advancements in art, science, and infrastructure.

• The rulers of this era were known for their patronage of education, literature, and engineering projects, including water

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management systems.

• Water Management in Ancient India

• Water management systems like tanks, wells, stepwells, and canals were crucial for agriculture and daily life.

• Such structures were often built using public funds or donations from wealthy patrons.

• Other Terms in Gupta Records

• Nadi: Refers to rivers or flowing water bodies.

• Kshetra: Denotes fields or agricultural lands.

• Prapa: Refers to rest houses or shelters, often with water facilities for travelers.

• Cultural Significance of Water Bodies

• Water bodies were often associated with temples and religious rituals.

• They were also venues for community gatherings and social events, showcasing their multifaceted role in society.

Q39. Answer: (d) Executes multiple instructions simultaneously by overlapping stages

The correct answer is Executes multiple instructions simultaneously by overlapping stages.

Key Points

• Pipelining is a technique used in CPU architecture to improve instruction throughput by executing multiple instructions simultaneously in a staggered manner.

• It divides the execution of an instruction into multiple stages (such as fetch, decode, execute, memory access, and write-back) that operate in parallel.

• Each stage of the pipeline processes a different instruction, enabling the CPU to work on several instructions at the same time.

• Pipelining significantly enhances overall performance by increasing instruction throughput, not clock speed.

• This technique is widely used in modern processors to optimize efficiency in executing complex operations.

Additional Information

• Instruction Pipeline Stages:

• The pipeline is typically divided into stages like Fetch, Decode, Execute, Memory Access, and Write-Back.

• Each stage performs a specific task, and all stages operate simultaneously on different instructions.

• Hazards in Pipelining:

• Hazards are potential issues that can disrupt the smooth execution of instructions in a pipeline.

• Types of hazards include Data Hazards (dependency on previous instructions), Control Hazards (branching or jumping), and Structural Hazards (resource conflicts).

• Superscalar Architecture:

• Modern CPUs often combine pipelining with superscalar execution, enabling multiple pipelines to operate in parallel.

• This further boosts the number of instructions executed per clock cycle.

• Limitations of Pipelining:

• Pipelining improves throughput but does not reduce the execution time of a single instruction.

• Performance gains can be affected by hazards or variations in instruction execution times.

Q40. Answer: (d) 42% loss

Shortcut Trick

Net percentage change = a + b + (a × b) ÷ 100

Here, markup percentage a = +45% and discount percentage b = −60%.

Net change = 45 − 60 + (45 × (−60)) ÷ 100

Net change = −15 − 2700 ÷ 100 = −15 − 27 = −42%.

The negative sign indicates a loss of 42%.

Therefore The correct answer is 42% loss.

Alternate Method

Given: Markup = 45% above CP, Discount = 60% on MP.

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

=> Let the Cost Price (CP) be 100.

=> Marked Price (MP) = 100 + 45% of 100 = 145.

=> Selling Price (SP) = MP − 60% of MP = 145 × (40 ÷ 100) = 58.

=> Loss = CP − SP = 100 − 58 = 42.

=> Loss Percentage = (42 ÷ 100) × 100 = 42%.

Therefore The correct answer is 42% loss.

Additional Information

Marked Price and Discount

Marked price is the price printed on an article. Discount is always calculated on the Marked Price to arrive at the Selling Price.

Net Profit or Loss

The final profit or loss depends on the cumulative effect of the initial markup and the subsequent discount offered.

Q41. Answer: (d) 48°

Shortcut Trick

The angle formed by the external bisectors of two angles of a triangle is given by the formula:

angle P = 90° − angle A/2

Given angle A = 84°

angle P = 90° − 84°/2 = 90° − 42° = 48°

Therefore The correct answer is 48°.

Alternate Method

Given:

angle A = 84°

Formula Used:

In triangle ABC, if sides AB and AC are produced to D and E, and the bisectors of exterior angles angle CBD and angle BCE meet at P, then angle BPC = 90° − angle A/2.

Calculations:

=> In triangle ABC, the sides AB and AC are produced to points D and E respectively.

=> The bisectors of exterior angles angle CBD and angle BCE meet at point P.

=> Point P is the ex-center of the triangle opposite to vertex A.

=> The measure of angle P is given by the relation: angle P = 90° − angle A/2

=> Substituting the value of angle A = 84°:

=> angle P = 90° − (84° / 2)

=> angle P = 90° − 42°

=> angle P = 48°

Therefore The correct answer is 48°.

Additional Information

Incenter Angle

The angle formed by the intersection of internal angle bisectors (Incenter I) is angle BIC = 90° + angle A/2.

Exterior Angle Theorem

An exterior angle of a triangle is equal to the sum of the two opposite interior angles: angle CBD = angle A + angle C.

Ex-center Definition

The ex-center is the point where the bisector of one interior angle and the bisectors of the other two exterior angles intersect.

Q42. Answer: (c) Providing services to foreign companies from India

The correct answer is Providing services to foreign companies from India.

Key Points

• Business Process Outsourcing (BPO) involves contracting operations and responsibilities of specific business functions to external service providers, often from other countries.

• India is a global leader in the BPO industry due to cost advantages, skilled English-speaking workforce, and advanced IT infrastructure.

• BPO services typically include customer support, technical support, data entry, human resources, finance, and accounting services for foreign companies.

• It allows foreign companies to focus on their core operations while outsourcing non-core tasks to service providers in countries like India.

• BPO has significantly contributed to India's economy, creating millions of jobs and boosting its IT and services sector.

Additional Information

• Key Terminologies in BPO:

• Offshore BPO: Outsourcing services to providers in another country, e.g., US companies outsourcing to India.

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• Nearshore BPO: Outsourcing to a nearby country with similar time zones, e.g., US outsourcing to Mexico.
• Onshore BPO: Outsourcing within the same country, but to third-party service providers.
• Benefits of BPO:
• Cost savings due to lower labor and operational costs in countries like India.
• Access to skilled professionals and advanced technology.
• Focus on core business activities by delegating non-core functions.
• Challenges in BPO:
• Data security and privacy concerns due to cross-border data exchange.
• Potential communication and cultural barriers between clients and service providers.
• Dependency on external vendors for critical business functions.
• Indian BPO Industry:
• India's BPO sector is a major contributor to the country's GDP and export revenues.
• Major BPO hubs in India include Bengaluru, Hyderabad, Pune, Chennai, and Gurugram.
• India's IT-BPO sector is supported by organizations like NASSCOM (National Association of Software and Service Companies).

Q43. Answer: (c) Atomic energy

The correct answer is Atomic energy.

Key Points

• Post-1991 economic reforms, most industries were deregulated to encourage private sector participation and reduce government control.
• Despite these reforms, atomic energy remained reserved for the public sector due to its strategic importance and security considerations.
• The Atomic Energy Act, 1962, governs all activities related to atomic energy in India and restricts its operations exclusively to the government.
• The Department of Atomic Energy (DAE), under the Government of India, is responsible for the development and regulation of nuclear energy in the country.
• The strategic nature of atomic energy ensures its role in defense, space exploration, and energy security, making it critical for national sovereignty.

Additional Information

• 1991 Economic Reforms:
• Also known as LPG (Liberalization, Privatization, and Globalization) reforms, these were introduced to address the balance of payments crisis and integrate India into the global economy.
• Sectors like banking, telecom, and manufacturing were opened up to private players, both domestic and foreign.
• Atomic Energy Act, 1962:
• It provides the legal framework for the development, regulation, and control of atomic energy in India.
• It prohibits any individual or private entity from engaging in activities related to atomic energy without government authorization.
• Department of Atomic Energy (DAE):
• Established in 1954, DAE is responsible for research, production, and development of nuclear power and related technologies.
• It oversees institutions like the Bhabha Atomic Research Centre (BARC) and Nuclear Power Corporation of India Limited (NPCIL).
• Strategic Importance of Atomic Energy:
• It plays a key role in national defense, including the development of nuclear weapons and submarines.
• Nuclear energy contributes to India’s energy security, providing a clean and sustainable source of power.
• Global Context:
• India is a signatory to international agreements like the Civil Nuclear Agreement and works with the International Atomic Energy Agency (IAEA) for peaceful use of nuclear technology.
• Despite international collaborations, the Indian government retains full control over its nuclear programs for strategic and security reasons.

Q44. Answer: (a) 14 km/hr

Shortcut Trick

Upstream speed (U) = 176 ÷ 16 = 11 km/hr

Downstream speed (D) = 85 ÷ 5 = 17 km/hr

Speed in still water = (D + U) ÷ 2 = (17 + 11) ÷ 2 = 14 km/hr

Therefore The correct answer is 14 km/hr.

Alternate Method

Given:

Upstream Distance = 176 km, Upstream Time = 16 hours

Downstream Distance = 85 km, Downstream Time = 5 hours

Formula Used:

Speed = Distance ÷ Time

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

Calculations:

=> Upstream Speed (U) = 176 ÷ 16 = 11 km/hr

=> Downstream Speed (D) = 85 ÷ 5 = 17 km/hr

=> x = (17 + 11) ÷ 2

=> x = 28 ÷ 2 = 14 km/hr

Therefore The correct answer is 14 km/hr.

Additional Information

Speed of Current

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

Relative Speed in Water

Downstream speed = x + y and Upstream speed = x − y, where x is boat speed and y is stream speed.

Average Speed

If a boat travels to a point and returns, Average Speed = (D × U) ÷ x, where x is boat speed in still water.

Q45. Answer: (b) 58.6

Shortcut Trick

Net change in total score = Correct score − Wrong score = 84 − 48 = +36.

Change in average = Net change ÷ Number of players = 36 ÷ 10 = +3.6.

Correct average = Initial average + Change in average = 55 + 3.6 = 58.6.

Therefore The correct answer is 58.6.

Alternate Method

Given:

Initial average of 10 players = 55

Incorrectly recorded score = 48

Actual correct score = 84

Formula Used:

Average = Total Sum ÷ Number of items

Correct Sum = (Initial Average × n) − Wrong Value + Correct Value

Calculations:

=> Initial Total Sum = 10 × 55 = 550

=> Correct Total Sum = 550 − 48 + 84

=> Correct Total Sum = 502 + 84 = 586

=> Correct Average = 586 ÷ 10

=> Correct Average = 58.6

Therefore The correct answer is 58.6.

Additional Information

Average Correction Rule

When one or more values are incorrectly recorded, the new average can be calculated using New Average = Old Average + [(Correct Value − Incorrect Value) ÷ Total Number of Items].

Net Deviation

The sum of deviations of all observations from their arithmetic mean is always zero. In correction problems, the net deviation is simply the difference between the correct and incorrect values.

Combined Average

If two groups with n1 and n2 items have averages a1 and a2, the combined average is (n1a1 + n2a2) ÷ (n1 + n2).

Q46. Answer: (d) 2

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) V has an exam on Friday.

Weekdays	Person
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	V
Saturday	
Sunday	

2) Exactly 3 people have exams between Q and S, neither of whom has on exam on Sunday.

3) T has an exam immediately before S.

Weekdays	Person
Monday	T
Tuesday	S
Wednesday	
Thursday	
Friday	V
Saturday	Q
Sunday	

3) P has an exam immediately after U.

After positioning P and U only one position is left which will be occupied by the only person left i.e. R.

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

Thus, two people have exams before U.

Hence, "Option 4" is the correct answer.

Q47. Answer: (a) Ensuring that a heading and the paragraph immediately following it always appear on the same page

The correct answer is Ensuring that a heading and the paragraph immediately following it always appear on the same page.

Key Points

• The "Keep with Next" option in MS Word ensures that the selected paragraph stays on the same page as the paragraph immediately following it, which is particularly useful for maintaining the logical flow of headings and related content.

• This feature is commonly applied to headings, subheadings, or introductory text to prevent disjointed presentation in documents.

• When enabled, it prevents page breaks between the selected paragraph and the subsequent one, ensuring a cohesive appearance.

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• It is particularly beneficial for professional documents like reports, legal briefs, or academic papers, where consistent formatting is essential.

• This option can be accessed via the "Paragraph" settings in the "Layout" or "Home" tab in MS Word.

Additional Information

• Widow/Orphan Lines:

• These refer to single lines of a paragraph left at the top (widow) or bottom (orphan) of a page, disrupting the readability of the text.

• MS Word provides an option called "Widow/Orphan Control" to prevent such occurrences.

• Keep Lines Together:

• This feature ensures that all lines of a paragraph remain on the same page, preventing the paragraph from being split across two pages.

• It is useful for short paragraphs or blocks of text that must not be separated for clarity.

• Page Breaks:

• Page breaks in MS Word manually or automatically divide content across pages.

• "Keep with Next" avoids unnecessary page breaks between logically connected sections.

• Paragraph Formatting:

• MS Word offers a range of paragraph formatting options, including alignment, indentation, spacing, and line breaks.

• "Keep with Next" is one of these options that enhances document structure and readability.

Q48. Answer: (b) 70

Given: Rajat ranked 16th from the top and 55th from the bottom in his class.

Rajat's rank from the top = 16th

Rajat's rank from the bottom = 55th

Total number of students = Rajat's rank from the top + Rajat's rank from the bottom - 1

= 16 + 55 - 1 → 70

Hence, "Option 2" is the correct answer.

Q49. Answer: (a) 800

Shortcut Trick

Savings = 30%, so Expenditure = 100% − 30% = 70%.

Given, 70% of Income = Rs. 560.

100% of Income = (560 ÷ 70) × 100 = 8 × 100 = Rs. 800.

Therefore The correct answer is Rs. 800.

Alternate Method

Given:

Savings percentage = 30%

Expenditure = Rs. 560

Formula Used:

Income = Expenditure + Savings

Expenditure % = 100% − Savings %

Calculations:

=> Let the Total Income be Rs. x.

=> Expenditure percentage = 100% − 30% = 70%

=> 70% of x = 560

=> (70 ÷ 100) × x = 560

=> x = (560 × 100) ÷ 70

=> x = 8 × 100 = 800

Therefore The correct answer is Rs. 800.

Additional Information

Percentage Change

To find the original value after a percentage decrease, use: Original = Result ÷ (1 − decrease%).

Base Value Concept

In income-expenditure problems, the Total Income is always treated as the 100% base value.

Savings and Expenditure Ratio

Ratio of Savings to Expenditure in this case is 30 : 70 or 3 : 7.

Q50. Answer: (d) French

The correct answer is French.

Key Points

• Yanaon (Yanam) and Chandernagore were part of the colonial possessions of France in India.

• The French established their presence in India in the 17th century and controlled territories like Pondicherry, Karaikal, Mahé, Yanam, and Chandernagore.

• Chandernagore, located in present-day West Bengal, was an important trading post for the French East India Company.

• Yanam, situated in present-day Andhra Pradesh, was part of French India until its merger with the Indian Union in 1954.

• These territories were governed under the administrative unit of French India until their integration into India post-independence.

Additional Information

• French Colonial Presence in India:

• The French East India Company was established in 1664 to compete with British and Dutch colonial powers in trade.

• The French aimed to establish trading posts along the coastlines of India, starting with Surat in Gujarat.

• Pondicherry (now Puducherry) became the headquarters of French India in 1674.

• Integration of French Territories into India:

• After India's independence in 1947, negotiations were held between the French and Indian governments for the integration of French territories.

• Chandernagore joined India in 1950 through a public referendum, while Pondicherry, Karaikal, Mahé, and Yanam merged in 1954.

• Legacy of French India:

• The French influence is still evident in Puducherry's architecture, culture, and cuisine.

• Puducherry is governed as a union territory, preserving its unique historical identity.

• Other Colonial Powers in India:

• The Portuguese controlled Goa, Daman, Diu, and Dadra & Nagar Haveli.

• The British ruled most of the Indian subcontinent through the British East India Company and later under direct Crown rule.

• The Dutch and Danish also had minor trading posts but were overshadowed by other powers.

Q51. Answer: (b) 13 : 136

Shortcut Trick

Convert days into hours by multiplying by 24.

Ratio = 39 : (17 × 24)

Ratio = 39 : 408

Divide both sides by the HCF (3) → 13 : 136.

Therefore The correct answer is 13 : 136.

Alternate Method

Given:

Quantity 1 = 39 hours

Quantity 2 = 17 days

Formula Used:

Ratio = Value1 : Value2 (Units must be the same)

1 day = 24 hours

Calculations:

=> Quantity 2 in hours = 17 × 24 hours

=> Quantity 2 = 408 hours

=> Required Ratio = 39 : 408

=> Ratio = 39/3 : 408/3

=> Ratio = 13 : 136

Therefore The correct answer is 13 : 136.

Additional Information

Unit Homogeneity in Ratios

A ratio is a comparison of two quantities of the same kind. Before calculating, ensure both quantities are in the same unit (e.g., both in hours or both in days).

Simplest Form of Ratio

A ratio a : b is in its simplest form if the Highest Common Factor (HCF) of a and b is 1.

Time Conversions

1 week = 7 days, 1 day = 24 hours, 1 hour = 60 minutes, 1 minute = 60 seconds.

Q52. Answer: (b) It ends the current section and starts a new section on the subsequent page

The correct answer is It ends the current section and starts a new section on the subsequent page.

Key Points

• A "Section Break (Next Page)" in MS Word is used to divide a document into separate sections, each with its own formatting.

• This feature ends the current section and starts a new section on the next page, allowing independent settings for headers, footers, and page orientation.

• It is particularly useful for creating different layouts within the same document, such as switching between portrait and landscape orientations.

• Section breaks are essential for documents with varied formatting requirements, like reports, books, or academic papers.

• This functionality ensures seamless transitions between sections while maintaining clarity and structure in the document.

Additional Information

• Types of Section Breaks in MS Word:

• Next Page: Starts the new section on the next page.

• Continuous: Starts the new section on the same page.

• Even Page: Starts the new section on the next even-numbered page.

• Odd Page: Starts the new section on the next odd-numbered page.

• Key Difference Between Section Breaks and Page Breaks:

• A Page Break simply moves content to the next page without altering formatting.

• A Section Break allows independent formatting for different parts of the document.

• Uses of Section Breaks:

• Creating separate headers and footers for different sections.

• Applying different page orientations or margins within the same document.

• Customizing page numbering for specific sections (e.g., Roman numerals for introductions).

• Shortcut for Section Break:

• In MS Word, you can insert a Section Break by navigating to the Layout tab, selecting Breaks, and choosing the desired option.

Q53. Answer: (b) SFJ : UIL

The logic followed here is:

HLF : JOH

And,

UYR : WBT

Similarly,

Option 2) SFJ : UIL

Hence, "Option 2" is the correct answer.

Q54. Answer: (c) 44th Constitutional Amendment Act

The correct answer is 44th Constitutional Amendment Act.

Key Points

• The 44th Constitutional Amendment Act of 1978 reduced the number of Fundamental Rights from seven to six.

• The amendment abolished the Fundamental Right to Property under Article 31 and moved it to the category of legal rights under Article 300A.

• The Fundamental Rights now include: Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, and Right to Constitutional Remedies.

• This amendment was enacted during the Janata Party government to reverse some provisions introduced during the Emergency period (1975-1977).

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• The 44th Amendment was aimed at strengthening the democratic framework and protecting individual rights.

Additional Information

• Fundamental Rights:

• These are enshrined in Part III of the Indian Constitution and are essential for the development of individuals and the protection of their liberties.

• They are justiciable, meaning individuals can approach the courts for their enforcement.

• Originally, there were seven Fundamental Rights, but the Right to Property was removed as a Fundamental Right by the 44th Amendment.

• 44th Constitutional Amendment Act:

• Enacted in 1978, it was introduced to undo the excesses of the 42nd Amendment passed during the Emergency.

• It aimed to restore the balance between the executive, legislature, and judiciary.

• It ensured that the proclamation of Emergency required stricter conditions and safeguarded citizens' rights during such times.

• Right to Property:

• Initially a Fundamental Right under Article 31, it guaranteed protection against arbitrary state actions regarding property.

• The 44th Amendment moved it to Article 300A, making it a legal right, thereby allowing the state to impose reasonable restrictions.

• Significance of the Amendment:

• It marked a shift from authoritarian governance toward strengthening democratic principles.

• It provided safeguards to prevent misuse of constitutional provisions in the future.

Q55. Answer: (c) BK – EY

The logic followed here is:

Option 1) KT – OH

Option 2) YH – CV

Option 3) BK – EY

Option 4) JS – NG

Thus, out of all 'BK – EY' is the odd one out.

Hence, "Option 3" is the correct answer.

Q56. Answer: (d) Election tribunals

The correct answer is Election tribunals.

Key Points

• Nineteenth Amendment Act, 1966 – This constitutional amendment abolished the Election Tribunals in India.

• Before this amendment, disputes related to the election of Members of Parliament and State Legislatures were decided by Election Tribunals.

• After the abolition, the jurisdiction to decide such disputes was transferred to the High Courts under the Representation of the People Act, 1951.

• The change was intended to streamline the process and ensure faster, more authoritative resolution of election disputes.

• This amendment came into effect on 11 December 1966.

Additional Information

• Privy Purse System (Option 1): Abolished by the 26th Constitutional Amendment Act, 1971. Privy purses were payments made to former rulers of princely states as part of their agreement of accession to India.

• Zamindari System (Option 2): Abolished soon after independence through various Zamindari Abolition Acts passed by states during the early 1950s, aimed at land reforms and ending intermediary landlordism.

• Separate Electorate System (Option 3): Abolished by the Constitution of India in 1950; it was earlier introduced during British rule (e.g., Government of India Act, 1909) to give separate representation to communities, notably Muslims.

• Election Tribunals: Were quasi-judicial bodies created under the Representation of the People Act, 1951, to decide election disputes before the Nineteenth Amendment.

• Amendment Procedure: Constitutional amendments in India are passed under Article 368 of the Constitution.

• Representation of the People Act, 1951: Governs the conduct of elections in India, qualifications/disqualifications, and the process for resolving disputes.

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Q57. Answer: (b) Rs. 1,000

The correct answer is Rs. 1,000.

Key Points

• The Securities and Exchange Board of India (SEBI) has reduced the minimum investment amount for Zero Coupon Zero Principal (ZCZP) bonds in the Social Stock Exchange (SSE) from Rs. 10,000 to Rs. 1,000.

• This step aims to increase retail participation and make social investments accessible to a wider segment of the population.

• ZCZP bonds are instruments specifically designed to raise funds for social enterprises listed on the SSE.

• The Social Stock Exchange (SSE) was introduced to provide a platform for non-profit organizations (NPOs) and for-profit social enterprises to raise funds for social causes.

• By lowering the investment threshold, SEBI seeks to promote inclusivity and encourage retail investors to contribute to social impact initiatives.

Additional Information

• Social Stock Exchange (SSE):

• The SSE is a platform under SEBI's regulatory framework to facilitate fundraising by social enterprises and non-profits.

• It was officially launched in December 2022 to promote impact-oriented financing.

• Entities listed on the SSE must fulfill specific eligibility criteria and disclose measurable social impact metrics.

• Zero Coupon Zero Principal (ZCZP) Bonds:

• ZCZP bonds are a unique financial instrument that does not pay interest or return the principal to the investor.

• The funds raised through ZCZP bonds are utilized for social impact projects.

• These bonds are exclusively issued by Non-Profit Organizations (NPOs) listed on the SSE.

• SEBI's Role in Social Stock Exchanges:

• SEBI introduced the regulatory framework for SSEs to enhance transparency and accountability in social impact funding.

• It ensures that only credible NPOs and social enterprises can access the SSE for funding.

• Retail Participation in Social Investments:

• Reducing the minimum investment amount makes social investments more inclusive.

• This move aligns with SEBI's broader goal of involving retail investors in nation-building and social impact.

Q58. Answer: (b) Micro

The correct answer is Micro.

Key Points

• The Micro Enterprises category constitutes the largest share of MSME registration on the Udyam Registration Portal.

• According to the latest data, approximately 94-95% of MSMEs registered on the Udyam Portal belong to the Micro category.

• Micro Enterprises are defined as businesses with an investment of up to Rs. 1 crore and a turnover of up to Rs. 5 crore, as per the MSME classification.

• The Udyam Registration Portal was launched to provide a simplified registration process for MSMEs, replacing the earlier Udyog Aadhaar system.

• This initiative has significantly boosted formalization and registration of Micro Enterprises, which form the backbone of India's economy.

Additional Information

• MSME Classification:

• Micro: Investment ≤ Rs. 1 crore and turnover ≤ Rs. 5 crore.

• Small: Investment ≤ Rs. 10 crore and turnover ≤ Rs. 50 crore.

• Medium: Investment ≤ Rs. 50 crore and turnover ≤ Rs. 250 crore.

• Udyam Registration Portal:

• Launched by the Ministry of Micro, Small, and Medium Enterprises on July 1, 2020.

• Replaces the older Udyog Aadhaar registration process for MSMEs.

• Designed to simplify registration and improve access to benefits under government schemes.

• Importance of Micro Enterprises:

• Micro Enterprises employ millions of workers, especially in rural and semi-urban areas.

• They play a pivotal role in poverty alleviation and economic development.

• These businesses are often linked to sectors like manufacturing, handicrafts, retail, and agriculture.

• Government Support for MSMEs:

• Credit Guarantee Scheme for Micro and Small Enterprises (CGTMSE).

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• Prime Minister's Employment Generation Programme (PMEGP).

• Interest Subvention Scheme for MSMEs to reduce financial burden.

Q59. Answer: (d) 19

Shortcut Trick

Net efficiency = Tap A + Tap B − Tap C

Tap A (3 hr) and Tap C (3 hr) cancel each other out (fill = empty).

Only Tap B (57 hr) contributes to filling the cistern.

Time to fill 1/3 cistern = (Total time for B) ÷ 3 = 57 ÷ 3 = 19 hours.

Therefore The correct answer is 19 hours.

Alternate Method

Given: Filling time Tap A = 3 hr, Tap B = 57 hr. Emptying time Tap C = 3 hr.

Formula Used: Efficiency = Total Work ÷ Time

Person	Days	Total Work	Efficiency
Tap A (Fill)	3	57	19
Tap B (Fill)	57	1	
Tap C (Empty)	3	−19	

=> Total Efficiency = 19 + 1 − 19 = 1

=> Total Work = 57 units

=> Required Work = 1/3 × 57 = 19 units

=> Time required = Required Work ÷ Total Efficiency

=> Time = 19 ÷ 1 = 19 hours

Therefore The correct answer is 19 hours.

Additional Information

Pipes and Cisterns Efficiency

Filling pipes have positive efficiency, while emptying pipes (leakages) have negative efficiency in calculations.

Total Work Concept

The capacity of the cistern is usually taken as the LCM of the individual times taken by the pipes to fill/empty it.

Combined Time Formula

For two pipes filling in 'a' and 'b' hours and one emptying in 'c' hours, the combined rate is (1/a + 1/b − 1/c).

Q60. Answer: (c) Cali, Colombia

The correct answer is Cali, Colombia.

Key Points

• The 2024 United Nations Biodiversity Convention (COP16) was initially held in Cali, Colombia, a city renowned for its biodiversity and environmental initiatives.

• COP16 is part of the Convention on Biological Diversity (CBD), aimed at addressing global biodiversity challenges.

• Cali, Colombia, served as a platform to discuss and advance the Kunming-Montreal Global Biodiversity Framework established during COP15.

• It emphasized the need for international collaboration to achieve the 2030 biodiversity targets, including the conservation of at least 30% of global terrestrial and marine ecosystems.

• The event attracted representatives from governments, NGOs, scientists, and indigenous communities to promote sustainable development and biodiversity conservation.

Additional Information

• Convention on Biological Diversity (CBD):

• CBD is an international treaty adopted in 1992 during the Earth Summit in Rio de Janeiro.

• Its primary goals are the conservation of biodiversity, sustainable use of its components, and fair sharing of benefits from genetic resources.

• The CBD Secretariat is headquartered in Montreal, Canada.

• Kunming-Montreal Global Biodiversity Framework:

• Adopted during COP15, this framework includes ambitious targets for biodiversity conservation by 2030.

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• Key goals include halting biodiversity loss, conserving 30% of terrestrial and marine ecosystems, and reducing pollution.
• It emphasizes financial and technological support for developing countries to achieve these targets.
• Importance of Biodiversity Conservation:
• Biodiversity is critical for ecosystem services such as pollination, water purification, and climate regulation.
• Loss of biodiversity can lead to ecosystem collapse and adverse impacts on food security and human health.
• International conventions like CBD play a vital role in addressing these challenges.
• Role of Indigenous Communities:
• Indigenous communities are custodians of significant biodiversity hotspots worldwide.
• Recognizing their rights and integrating traditional knowledge into conservation efforts is crucial.
• COP16 emphasized the inclusion of indigenous voices in biodiversity policymaking.

Q61. Answer: (a) QTP

The logic followed here is:
Option 1) QTP
Option 2) MPK

Option 3) KNI
Option 4) ORM

Thus, out of all 'QTP' is the odd one out.
Hence, "Option 1" is the correct answer.

Q62. Answer: (b) O

Given: Seven friends, D, E, F, G, M, N and O, are sitting in a row facing north.
1) Only five people sit between G and D.
2) F sits to the immediate left of D.
3) Only one person sits between F and M.
4) O sits at some place to the left of E but at some place to the right of N.
Thus, O sits third from the left end of the line.
Hence, "Option 2" is the correct answer.

Q63. Answer: (d) 6 km to the West

Given:
Mr. Chotu starts from Point A and drives 16 km towards the North.
He then takes a left turn, drives 8 km, turns left and drives 7 km.
He then takes a right turn, drives 4 km, turns left and drives 12 km.
He then takes a left turn and drives 18 km.
He takes a final left turn, drives 3 km and stops at Point P.
Thus, Mr. Chotu should drive 6 km (18 km - 4 km - 8 km) in the west direction in order to reach Point P again.
Hence, "Option 4" is the correct answer.

Q64. Answer: (b) Article 344

The correct answer is Article 344.
Key Points
• Article 344 of the Indian Constitution deals with the formation of the Official Language Commission.
• The Commission is tasked with making recommendations to the President regarding the progressive use of Hindi and restrictions on the use of English in official purposes.
• The first Official Language Commission was constituted in 1955 under the chairmanship of B.G. Kher.
• Article 344 also mandates the President to appoint a Committee composed of members of Parliament to examine the recommendations of the Commission.
• This article plays a pivotal role in implementing the constitutional vision for promoting Hindi as the official language of India.
Additional Information
• Article 343 of the Indian Constitution specifies Hindi in Devanagari script as the official language of India.

• Article 341 deals with the inclusion of Scheduled Castes in the Constitution, not language-related matters.

• Article 342 pertains to the specification of Scheduled Tribes, unrelated to language provisions.

• The Official Language Act of 1963 further elaborates on the use of Hindi and English in official communications, ensuring linguistic inclusivity.

• The idea behind these constitutional provisions is to promote national integration while respecting linguistic diversity across India.

Q65. Answer: (b) Shift the equilibrium left

The correct answer is Shift the equilibrium left.

Key Points

• Adding H^+ ions to the equilibrium system CH3COOH <=> CH3COO^- + H^+ increases the concentration of H^+ ions.

• According to Le Chatelier's Principle, the system will shift to counteract the disturbance, favoring the reverse reaction.

• The reverse reaction converts CH3COO^- and H^+ into CH3COOH, thereby shifting the equilibrium to the left.

• This adjustment decreases the dissociation of acetic acid (CH3COOH) and increases its concentration in the solution.

• The equilibrium shift restores balance by reducing the excess H^+ ions added to the system.

Additional Information

• Le Chatelier's Principle:

• It states that if a dynamic equilibrium is disturbed by changing conditions, the system responds to counteract the change and restore equilibrium.

• In this case, adding H^+ ions shifts the equilibrium to reduce their concentration.

• Acetic Acid (CH3COOH):

• A weak acid that partially dissociates in water into CH3COO^- and H^+ ions.

• The dissociation is reversible, allowing equilibrium to be established between the reactants and products.

• Weak Acids:

• Weak acids do not fully ionize in water; only a small fraction dissociates into ions.

• Examples include acetic acid (CH3COOH), citric acid, and formic acid.

• Equilibrium Constants:

• The equilibrium constant (Ka) for weak acids measures the extent of dissociation of the acid.

• For acetic acid, Ka is small, indicating limited dissociation in aqueous solutions.

• Effect of Adding Reactants or Products:

• Adding reactants or products disturbs the equilibrium, prompting a shift to re-establish balance.

• In this case, adding H^+ ions favors the reverse reaction to reduce their concentration.

Q66. Answer: (d) Gopal Krishna Gokhale

The correct answer is Gopal Krishna Gokhale.

Key Points

• Gopal Krishna Gokhale was a prominent leader of the Moderate faction in the Indian National Movement, advocating gradual reforms and constitutional methods.

• He opposed the extremist ideology led by Bal Gangadhar Tilak, Bipin Chandra Pal, and Lala Lajpat Rai during the "Extremist Phase" (1905–1917).

• Gokhale founded the Servants of India Society in 1905 to promote education, social reform, and dialogue with the British government.

• Unlike extremists, Gokhale believed in cooperation with the British government and rejected aggressive methods like boycott and swadeshi.

• His moderate approach and belief in non-violence inspired future leaders, notably Mahatma Gandhi, who regarded Gokhale as his political mentor.

Additional Information

• Extremist Leaders (1905-1917):

• Lala Lajpat Rai, Bipin Chandra Pal, and Bal Gangadhar Tilak were the three main leaders of the extremist faction, collectively referred to as the "Lal-Bal-Pal" trio.

• They advocated swadeshi, boycott of British goods, and self-reliance to achieve independence.

• Their methods included mass protests, public mobilization, and stronger resistance against colonial rule.

• Moderates vs. Extremists:

• Moderates, led by leaders like Gokhale, relied on petitions, resolutions, and constitutional reforms.

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• Extremists adopted a more radical approach, emphasizing direct action and mass participation.
• The ideological split became evident during the Surat session of Congress in 1907.
• Swadeshi Movement:
• The Swadeshi Movement was launched in 1905 as a response to the partition of Bengal.
• It involved boycotting British goods and promoting indigenous industries.
• Extremists played a key role in popularizing swadeshi, while moderates supported it cautiously.
• Servants of India Society:
• Founded by Gokhale in 1905, the society aimed to train Indians in social service and nation-building.
• It focused on education, poverty alleviation, and improving governance.
• It became a significant platform for nurturing future leaders committed to Gandhian ideals.

Q67. Answer: (b) S

Given: Seven boxes, D, E, F, G, S, T and U, are kept one over the other but not necessarily in the same order.

1) No box is kept above F.

2) Only three boxes are kept between F and S.

Boxes
F
S

3) E is kept immediately above S.

4) Only one box is kept between D and E.

5) Only four boxes are kept between D and G.

Boxes
F
D
E
S
G

6) T is kept at some place above U.

Boxes
F
D
T
E
S
U
G

Thus, S box is kept second below T.

Hence, "Option 2" is the correct answer.

Q68. Answer: (c) DRAM

The correct answer is DRAM.

Key Points

• DRAM (Dynamic Random Access Memory) is a type of volatile memory that is widely used as the primary working memory (RAM) in personal computers.

• It requires constant refreshing of data multiple times per second to retain information, making it "dynamic."

• DRAM is faster than traditional storage devices such as hard drives but slower than SRAM (Static Random Access Memory).

• It is cost-effective and offers high storage density, which is why it is the preferred choice for system memory in most PCs and laptops.

• DRAM modules are available in various forms, such as DDR (Double Data Rate) versions like DDR3, DDR4, and DDR5, which enhance speed and efficiency.

Additional Information

• Volatile Memory:

• Volatile memory requires a constant power supply to retain data. When the power is turned off, all data is lost.

• Examples include DRAM and SRAM, used mainly for temporary data storage during system operations.

• SRAM (Static Random Access Memory):

• SRAM is another type of volatile memory that does not require constant refreshing to retain data.

• It is faster but more expensive and less dense compared to DRAM, making it suitable for cache memory in CPUs.

• DDR (Double Data Rate) DRAM:

• DDR memory improves the performance of DRAM by transferring data on both the rising and falling edges of the clock signal.

• DDR4 and DDR5 are the most commonly used DRAM types in modern computers, offering higher bandwidth and lower power consumption.

• Non-Volatile Memory:

• Non-volatile memory retains data even when the power is turned off, making it ideal for long-term data storage.

• Examples include flash memory, SSDs, and ROM (Read-Only Memory).

• CMOS (Complementary Metal-Oxide-Semiconductor):

• CMOS is a low-power semiconductor technology used for constructing integrated circuits.

• It is commonly used for small amounts of memory in devices like BIOS to store system settings.

Q69. Answer: (b) XS −17

The logic followed here is:

HL 17 is related to KM −4

And,

LN 12 is related to OO −9

Similarly,

UR 4 is related to

Hence, "Option 2" is the correct answer.

Q70. Answer: (a) √(149/189)

Shortcut Trick

Directly calculate the values of the squared expressions:

$(a - b)^2 = (a^2 + b^2) - 2ab = 169 - 20 = 149$

$(a + b)^2 = (a^2 + b^2) + 2ab = 169 + 20 = 189$

Required Ratio = $\sqrt{((a - b)^2 / (a + b)^2)} = \sqrt{(149/189)}$

Therefore The correct answer is √(149/189).

Alternate Method

Given:

$a^2 + b^2 = 169$

$ab = 10$

$a > b$

Formula Used:

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

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

Calculations:

$\Rightarrow (a - b)^2 = 169 - 2(10)$

$\Rightarrow (a - b)^2 = 169 - 20 = 149$

$\Rightarrow a - b = \sqrt{149}$ (Since a > b)

$\Rightarrow (a + b)^2 = 169 + 2(10)$

$\Rightarrow (a + b)^2 = 169 + 20 = 189$

$\Rightarrow a + b = \sqrt{189}$

$\Rightarrow$ Ratio $= (a - b) / (a + b) = \sqrt{149} / \sqrt{189}$

$\Rightarrow$ Ratio $= \sqrt{(149/189)}$

Therefore The correct answer is $\sqrt{(149/189)}$.

Additional Information

Standard Algebraic Identities

Basic expansion: $(a + b)^2 = a^2 + b^2 + 2ab$ and $(a - b)^2 = a^2 + b^2 - 2ab$.

Difference of Squares

$(a + b)(a - b) = a^2 - b^2$.

Relation between Squares

$(a + b)^2 - (a - b)^2 = 4ab$.

Q71. Answer: (d) ALU handles calculations and logic functions; CU manages instruction flow and coordination.

The correct answer is ALU handles calculations and logic functions; CU manages instruction flow and coordination..

Key Points

• Arithmetic Logic Unit (ALU) performs arithmetic operations (addition, subtraction, multiplication, etc.) and logical operations (AND, OR, NOT, etc.).

• The Control Unit (CU) directs the operation of the CPU by interpreting program instructions and coordinating the flow of data between the CPU, memory, and peripherals.

• While the ALU focuses on computation, the CU ensures the proper sequencing and execution of instructions.

• The CU does not perform calculations; its role is purely supervisory and organizational within the CPU architecture.

• The ALU and CU are integral components of the CPU, working together to ensure efficient data processing and program execution.

Additional Information

• Central Processing Unit (CPU):

• The CPU is the primary component of a computer responsible for executing instructions.

• It consists of three main parts: the ALU, CU, and registers.

• Registers provide temporary storage for quick data access during processing.

• Arithmetic Logic Unit (ALU):

• It is a fundamental part of the CPU that performs all arithmetic and logical operations.

• Examples of arithmetic operations include addition, subtraction, multiplication, and division.

• Logical operations include comparisons, such as greater than, less than, and equality.

• Control Unit (CU):

• It acts as the "brain" of the CPU, ensuring instruction execution in the correct sequence.

• The CU decodes instructions from programs and sends control signals to other components.

• It manages communication between the CPU and input/output devices.

• CPU Architecture:

• Modern CPUs use a combination of ALU, CU, and cache memory for efficient data processing.

• Multi-core CPUs contain multiple ALUs and CUs to enhance parallel processing and overall performance.

• Instruction pipelining is a technique used to improve the execution speed of a CPU.

Q72. Answer: (c) 95

Given: $20 \div 5 + 8 \times 2 + 1 = ?$

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

20 ÷ 5 + 8 × 2 + 1 = ? => 20 × 5 - 8 ÷ 2 - 1 = ?

=> 20 × 5 - 8 ÷ 2 - 1 = ?

=> 20 × 5 - 4 - 1 = ?

=> 100 - 4 - 1 = ?

=> 95 = ?

Hence, "Option 3" is the correct answer.

Q73. Answer: (a) Ashoka

The correct answer is Ashoka.

Key Points

• Ashoka, the third emperor of the Maurya Dynasty, is renowned for constructing the maximum number of Buddhist stupas across India.

• He built stupas to house and honor the sacred relics of Lord Buddha, promoting Buddhism as a state religion after his conversion post the Kalinga War.

• Ashoka is credited with constructing 84,000 stupas, as per Buddhist texts like the "Ashokavadana."

• Famous stupas such as the Sanchi Stupa and Barabar caves were built under his patronage, symbolizing the spread of Buddhist teachings.

• These stupas served both as religious monuments and centers for Buddhist education and community gathering.

Additional Information

• Buddhist Stupa:

• A stupa is a dome-shaped structure that serves as a Buddhist shrine and symbolizes enlightenment, the path to nirvana, and the Buddha’s relics.

• The stupa design is rooted in ancient Indian funerary traditions, representing the Buddha's parinirvana (final release from the cycle of rebirth).

• Ashoka’s Role in Buddhism:

• Ashoka embraced Buddhism after the Kalinga War, where he witnessed the immense suffering caused by the conflict.

• He convened the Third Buddhist Council to purify and systematize Buddhist teachings and sent missionaries to other regions to propagate Buddhism.

• Sanchi Stupa:

• Located in Madhya Pradesh, it is one of the oldest stone structures in India and a UNESCO World Heritage Site.

• It was commissioned by Ashoka and contains relics of the Buddha.

• Ashoka’s Edicts:

• Ashoka’s inscriptions, engraved on pillars and rocks, emphasize moral values, non-violence, and the spread of Dhamma (righteousness).

• The famous Ashoka Pillars, including the one at Sarnath, symbolize his commitment to Buddhism and ethical governance.

Q74. Answer: (b) 1,58,400

Shortcut Trick

Radius (r) = 6 ÷ 2 = 3 cm

Height (h) = 56 m = 5600 cm

Volume = $\pi r^2 h$ = (22/7) × 3^2 × 5600

Volume = 22 × 9 × 800 = 1,58,400 cm^3

Therefore The correct answer is 1,58,400 cm^3.

Alternate Method

Given:

Diameter of the wire = 6 cm

Length (Height) of the wire = 56 m

Formula Used:

Volume of a Cylinder = $\pi r^2 h$

Calculations:

=> Radius (r) = Diameter ÷ 2 = 6/2 = 3 cm

=> Length (h) = 56 × 100 = 5600 cm

=> Volume = (22/7) × 3 × 3 × 5600

=> Volume = (22/7) × 9 × 5600

=> Volume = 22 × 9 × 800

=> Volume = 198 × 800

=> Volume = 1,58,400 cm^3

Therefore The correct answer is 1,58,400 cm^3.

Additional Information

Volume of Cylinder

The amount of space occupied by a 3D cylindrical object is πr^2h, where r is the radius and h is the height.

Curved Surface Area (CSA)

The area of the curved part of the cylinder is $2\pi rh$.

Total Surface Area (TSA)

The sum of curved area and two circular bases: $2\pi r(h + r)$.

Unit Conversion

Always ensure all dimensions are in the same unit. 1 meter = 100 centimeters.

Q75. Answer: (b) 81.9

Shortcut Trick

Let the initial distance be 156 km (LCM of 52 and 39). Total distance for outward journey = 156 + 2 × 156 = 468 km.

Outward time = (156 ÷ 52) + (312 ÷ 39) = 3 + 8 = 11 hours.

Total journey distance (out + return) = 468 × 2 = 936 km. Total time = 936 ÷ 56 = 117/7 hours.

Return time = 117/7 − 11 = (117 − 77)/7 = 40/7 hours.

Return Speed = 468 ÷ (40/7) = (468 × 7) ÷ 40 = 3276 ÷ 40 = 81.9 km/hr.

Therefore The correct answer is 81.9 km/hr.

Alternate Method

Given: Speed 1 = 52 km/h, Distance 1 = D; Speed 2 = 39 km/h, Distance 2 = 2D; Average Speed = 56 km/h.

Formula: Average Speed = Total Distance ÷ Total Time

=> Total Distance = D + 2D + 3D (Return) = 6D

=> Total Time = (D/52) + (2D/39) + (3D/v)

=> 56 = 6D / [(D/52) + (2D/39) + (3D/v)]

=> 56 = 6 / [(3/156) + (8/156) + (3/v)]

=> 56 = 6 / [11/156 + 3/v]

=> 11/156 + 3/v = 6/56 = 3/28

=> 3/v = 3/28 − 11/156 = (3 × 39 − 11 × 7) / 1092 = (117 − 77) / 1092

=> 3/v = 40 / 1092

=> v = (1092 × 3) / 40 = 3276 / 40 = 81.9 km/hr

Therefore The correct answer is 81.9 km/hr.

Additional Information

Average Speed (Equal Distances)

When two equal distances are covered at speeds u and v, Average Speed = 2uv / (u + v). For three equal distances, it is 3uvw / (uv + vw + wu).

Weighted Average Speed

If distances d1, d2,... are covered at speeds v1, v2,..., Average Speed = (Σd_i) / (Σd_i/v_i).

Time & Distance Relation

Distance = Speed × Time. If distance is constant, speed is inversely proportional to time (v1/v2 = t2/t1).

Q76. Answer: (d) Alauddin Khilji

The correct answer is Alauddin Khilji.

Key Points

• Alauddin Khilji, the second ruler of the Khilji dynasty (1296–1316), is associated with the expedition to Bhilsa (modern-day Vidisha, Madhya Pradesh) in AD 1292.

• Bhilsa was a prominent cultural and religious center during the medieval period, known for its strategic location and wealth.

• This expedition aimed to subdue the region and establish control over its resources as part of Alauddin Khilji's expansionist policies.

• Alauddin's military campaigns were instrumental in consolidating the Delhi Sultanate's rule and extending its influence over central India.

• The Bhilsa expedition was a precursor to his later, more significant campaigns in the Deccan and other regions.

Additional Information

• Alauddin Khilji's Military Campaigns

• He is known for his conquests in Gujarat, Ranthambore, Chittor, and the Deccan, which expanded the Delhi Sultanate's territorial reach significantly.

• His campaigns were marked by meticulous planning, strong military leadership, and efficient resource management.

• Bhilsa (Vidisha)

• An ancient city located in Madhya Pradesh, Vidisha was historically significant for its Buddhist monuments and the famous Sanchi Stupa nearby.

• It was a center of trade, culture, and religion during the medieval period, attracting the attention of invading rulers.

• The Khilji Dynasty

• Established by Jalaluddin Khilji in 1290, the dynasty ruled the Delhi Sultanate until 1320.

• Alauddin Khilji is considered its most prominent ruler, known for his administrative reforms and military strategies.

• Administrative and Economic Reforms of Alauddin Khilji

• He introduced market control policies to stabilize prices and prevent hoarding.

• Land revenue reforms ensured a steady income for the state while curbing the power of local chieftains.

• Legacy of Alauddin Khilji

• He is remembered for his ambitious expansionist policies and his efforts to strengthen the Delhi Sultanate.

• His reign marked a significant phase in the consolidation of Muslim rule in India.

Q77. Answer: (a) 200

Shortcut Trick

Sum of last two numbers = Total Sum − (Sum of first two + Third number)

Sum of last two = 655 − (77 × 2 + 101)

Sum of last two = 655 − (154 + 101) = 655 − 255 = 400

Required Average = 400 ÷ 2 = 200

Therefore The correct answer is 200.

Alternate Method

Given:

Sum of 5 numbers = 655

Average of 1^(st) and 2^(nd) number = 77

Value of 3^(rd) number = 101

Formula Used:

Sum = Average × Number of observations

Average = Sum ÷ Number of observations

Calculations:

=> Sum of first two numbers = 77 × 2 = 154

=> Sum of first three numbers = 154 + 101 = 255

=> Sum of remaining two numbers = Total Sum − Sum of first three numbers

=> Sum of remaining two numbers = 655 − 255 = 400

=> Average of remaining two numbers = 400 ÷ 2

=> Average = 200

Therefore The correct answer is 200.

Additional Information

Definition of Average

Average is the central value of a set of data, calculated by dividing the total sum of values by the number of values.

Properties of Averages

If every number in a set is increased or decreased by a constant 'k', the average also increases or decreases by 'k'.

Weighted Average

When groups have different sizes, the combined average = (n1x1 + n2x2) ÷ (n1 + n2).

Q78. Answer: (b) 7

Given: (Left) 411 559 916 247 769 (Right)

According to the question:

Given numbers	411	559	916	247	769
Number are arranged in ascending order	247	411	559	769	916

So,

First digit of the highest number → 916 → 2

First digit of the lowest number → 247 → 9

Thus, if the first digit of the lowest number is subtracted from the first digit of the highest number then the resultant will be → 9 - 2 → 7

Hence, "Option 2" is the correct answer.

Q79. Answer: (c) 24

Shortcut Trick

Given: Curved Surface Area (CSA) = 1/2 × Total Surface Area (TSA)

For a cylinder, if CSA = 1/2 TSA, then $2\pi rh = 1/2 \times 2\pi r(h + r)$

This simplifies to $2h = h + r \Rightarrow h = r$

Given height (h) = 12 cm, therefore radius (r) = 12 cm

Diameter = 2 × r = 2 × 12 = 24 cm

Therefore The correct answer is 24 cm.

Alternate Method

Given:

Height (h) of the cylinder = 12 cm

Curved Surface Area (CSA) = 1/2 × Total Surface Area (TSA)

Formula Used:

CSA of cylinder = $2\pi rh$

TSA of cylinder = $2\pi r(h + r)$

Calculations:

$\Rightarrow 2\pi rh = 1/2 \times [2\pi r(h + r)]$

$\Rightarrow 2\pi rh = \pi r(h + r)$

$\Rightarrow 2h = h + r$

$\Rightarrow r = h$

$\Rightarrow r = 12$ cm

⇒ Diameter (d) = 2 × r

$\Rightarrow d = 2 \times 12 = 24$ cm

Therefore The correct answer is 24 cm.

Additional Information

Volume of Cylinder

The amount of space occupied by the cylinder is given by $V = \pi r^2 h$.

Base Area of Cylinder

The area of the circular base or top is $A = \pi r^2$. TSA is the sum of CSA and twice the Base Area.

Relation between Diameter and Radius

The diameter is the longest chord of the circular base and is twice the radius (d = 2r).

Q80. Answer: (b) Alpha cells

The correct answer is Alpha cells.

Key Points

• Alpha cells are one of the four primary types of islet cells found in the pancreas.

• These cells secrete glucagon, a peptide hormone that primarily raises blood glucose levels.

• Glucagon works by stimulating the liver to convert glycogen into glucose (glycogenolysis) and releasing it into the bloodstream.

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• Alpha cells play a crucial role in maintaining glucose homeostasis, especially during fasting or low blood sugar conditions.

• The secretion of glucagon is regulated by blood glucose levels; it increases when blood glucose levels fall and decreases when they rise.

Additional Information

• Beta cells: These cells secrete insulin, a hormone that lowers blood glucose levels by facilitating glucose uptake by cells.

• Delta cells: These cells produce somatostatin, a hormone that inhibits the secretion of both insulin and glucagon.

• PP cells: Also known as pancreatic polypeptide cells, they secrete pancreatic polypeptide, which helps regulate pancreatic enzyme secretion and gastrointestinal motility.

• Glucose homeostasis: It refers to the balanced regulation of blood sugar levels, primarily controlled by insulin (lowers glucose) and glucagon (raises glucose).

• Diabetes mellitus: A chronic condition characterized by the inability to properly regulate blood glucose, often due to beta-cell dysfunction or insulin resistance.

Q81. Answer: (d) Gyanesh Kumar

The correct answer is Gyanesh Kumar.

Key Points

• Gyanesh Kumar was appointed as the 26th Chief Election Commissioner of India in February 2025.

• He succeeded Rajiv Kumar, who served as the 25th Chief Election Commissioner.

• The Chief Election Commissioner is responsible for ensuring free and fair elections in India, including parliamentary, state assembly, and presidential elections.

• Gyanesh Kumar is an experienced IAS officer with a career spanning decades in public administration and governance.

• The Election Commission of India is a constitutional body established under Article 324 of the Indian Constitution to oversee the election process in the country.

Additional Information

• Election Commission of India (ECI):

• The ECI is an autonomous constitutional authority responsible for administering elections in India.

• It was established on 25th January 1950, and this day is celebrated as National Voters' Day in India.

• The commission consists of the Chief Election Commissioner and two Election Commissioners.

• Chief Election Commissioner (CEC):

• The CEC is appointed by the President of India and has a tenure of 6 years or up to the age of 65 years, whichever is earlier.

• The CEC can only be removed through impeachment by Parliament, similar to the process for removing a Supreme Court judge.

• Role of the Election Commission:

• Conducts elections to the Lok Sabha, Rajya Sabha, and State Legislatures.

• Oversees elections for the offices of the President and Vice-President of India.

• Ensures implementation of the Model Code of Conduct during elections.

• Regulates political parties and monitors their expenditure.

• Recent Electoral Reforms:

• Introduction of Voter Verifiable Paper Audit Trail (VVPAT) for transparency in elections.

• Linking of Aadhaar with voter IDs to eliminate duplicate entries in the electoral roll.

• Extension of postal ballot facilities to senior citizens and Persons with Disabilities (PwDs).

Q82. Answer: (b) Rs. 11,650

Shortcut Trick

Remaining percentage after house rent = 100% − 28% = 72%.

Value of this 72% = Conveyance + Grocery + Savings.

72% of Salary = Rs. 687 + Rs. 7,483 + Rs. 218 = Rs. 8,388.

100% (Total Salary) = (8388 ÷ 72) × 100 = 116.5 × 100 = Rs. 11,650.

Therefore The correct answer is Rs. 11,650.

Alternate Method

Given:

House Rent = 28% of Monthly Salary

Conveyance = Rs. 687

Grocery = Rs. 7,483

Savings = Rs. 218

Calculations:

=> Total spending (excluding rent) and savings = Rs. 687 + Rs. 7,483 + Rs. 218

=> Total non-rent amount = Rs. 8,388

=> Percentage of salary excluding rent = 100% − 28% = 72%

=> 72% of Monthly Salary = Rs. 8,388

=> 1% of Monthly Salary = 8388 ÷ 72 = Rs. 116.5

=> 100% of Monthly Salary = 116.5 × 100 = Rs. 11,650

Therefore The correct answer is Rs. 11,650.

Additional Information

Percentage Base Change

When a value is divided into multiple components, the sum of all components in percentage must equal 100% of the base value.

Net Savings Calculation

Income = Expenditure + Savings. If expenditure is given as a mix of percentage and absolute values, always group absolute values first.

Q83. Answer: (d) Vipin Kumar

The correct answer is Vipin Kumar.

Key Points

• Vipin Kumar was appointed as the Chairman of the Airports Authority of India (AAI) in October 2024.

• The Airports Authority of India is a statutory body under the Ministry of Civil Aviation, responsible for creating, upgrading, maintaining, and managing civil aviation infrastructure in India.

• Vipin Kumar's appointment comes with the mandate to oversee critical modernization projects and ensure the growth and sustainability of India's aviation sector.

• He has extensive experience in aviation management and has previously held significant roles within the aviation sector.

• His leadership is expected to enhance India's airport infrastructure, focusing on passenger experience and operational efficiency.

Additional Information

• Airports Authority of India (AAI):

• Established in 1995, the AAI manages 137 airports in India, including 24 international airports, 10 customs airports, and 103 domestic airports.

• AAI is responsible for providing Air Traffic Management (ATM) services over Indian airspace and adjoining oceanic areas.

• It plays a key role in implementing government initiatives for enhancing regional connectivity, such as the UDAN (Ude Desh ka Aam Naagrik) scheme.

• UDAN Scheme:

• Launched in 2017 under the Regional Connectivity Scheme (RCS), UDAN aims to make air travel affordable and accessible to the common citizen.

• The scheme focuses on connecting underserved and unserved airports across India.

• Under UDAN, airlines receive financial incentives and concessions to operate on regional routes.

• Modernization of Airports:

• India is investing heavily in airport modernization to cater to the rising demand for air travel.

• Major airports such as Delhi and Mumbai are undergoing expansion, while greenfield projects like Navi Mumbai International Airport are in progress.

• Digital solutions like DigiYatra are being implemented to enhance passenger convenience through biometric-enabled seamless travel.

• Global Aviation Trends:

• India is the third-largest aviation market globally and is expected to become the largest by 2030.

• Sustainability initiatives, such as the use of sustainable aviation fuel (SAF), are gaining momentum globally.

• Technological advancements like AI in air traffic management and smart airports are shaping the future of the aviation industry.

Q84. Answer: (d) IBD

The logic followed here is:

Hence, "Option 4" is the correct answer.

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Q85. Answer: (a) 27

Given:

[81 ÷ {21 + 9 × (5 - 7)}]

Calculation:

[81 ÷ {21 + 9 × (5 - 7)}]

=> [81 ÷ {21 + 9 × -2}]

=> [81 ÷ {21 - 18}]

=> [81 ÷ 3]

=> 27

Therefore The correct answer is option (1).

Q86. Answer: (a) Only 1

The correct answer is Option 1.

Key Points

• Exercise INDRA held in March-April 2025 included participation of Russian Federation Naval Ships Pechanga, Rezkiy, and Aldar Tsydenzhapov, along with Indian Naval Ships Rana, Kuthar, and Maritime Patrol Aircraft P8I, making Option 1 correct.

• The exercise aimed to enhance interoperability and strengthen maritime cooperation between the Indian Navy and Russian Federation Navy.

• The exercise focused on complex maritime operations such as anti-submarine warfare, surface warfare, and air defense exercises.

• This iteration of Exercise INDRA was part of the longstanding strategic partnership between India and Russia, showcasing joint efforts in maintaining maritime security.

Additional Information

• Exercise INDRA Overview: A bilateral military exercise between India and Russia, initiated in 2003, aimed at improving joint operational capabilities in land, sea, and air domains.

• Harbour Phase: This phase typically involves planning sessions, cultural exchanges, and professional interactions between participating naval personnel.

• Sea Phase: Includes live-action drills such as search-and-rescue operations, naval gunfire, anti-aircraft drills, and coordinated maneuvers.

• Strategic Partnership: India and Russia have a long history of defense cooperation, including joint military exercises, defense technology sharing, and mutual support in strategic maritime interests.

• Maritime Patrol Aircraft P8I: A state-of-the-art aircraft used by the Indian Navy for surveillance and reconnaissance operations, equipped with advanced radar systems and weapon capabilities.

Q87. Answer: (b) 39

Shortcut Trick

Subtract the remainders from the given numbers: (48 − 9) and (46 − 7).

Find the HCF of 39 and 39.

HCF(39, 39) = 39.

Therefore The correct answer is 39.

Alternate Method

Given: Numbers 48 and 46; Remainders 9 and 7.

Formula Used: Required Number = HCF[(Number1 − Remainder1), (Number2 − Remainder2)]

=> First number after removing remainder = 48 − 9 = 39

=> Second number after removing remainder = 46 − 7 = 39

=> Greatest common divisor for 39 and 39 is 39.

Therefore The correct answer is 39.

Additional Information

HCF with different remainders

To find the greatest number that divides x, y, z leaving remainders a, b, c respectively, calculate HCF of (x−a), (y−b), and (z−c).

HCF with same remainder

If the remainder is the same but unknown, the greatest number is HCF of |x−y|, |y−z|, and |z−x|.

LCM Relationship

For any two numbers A and B: HCF(A, B) × LCM(A, B) = A × B.

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Q88. Answer: (b) Chairman

The correct answer is Chairman.

Key Points

• The Chairman is the political head of a municipality in India, responsible for representing the elected members and presiding over meetings.

• The Chairman is chosen from among the elected members of the Municipal Council, which governs smaller towns or urban areas.

• They are tasked with ensuring that the municipality's policies and programs are implemented effectively and align with the needs of the local community.

• The Chairman works in collaboration with the Chief Municipal Officer (administrative head) to oversee the functioning of the municipality.

• This position is distinct from the Mayor, who is the political head of a Municipal Corporation in larger urban areas.

Additional Information

• Municipal Council:

• A Municipal Council administers smaller urban areas, usually towns or cities with a population of 20,000 to 300,000.

• The council is composed of elected representatives, including the Chairman, who leads the council.

• It is responsible for providing essential services like water supply, sanitation, roads, and public health.

• Municipal Corporation:

• Municipal Corporations govern larger urban areas or metropolitan cities with populations exceeding 1 million.

• The Mayor is the political head of a Municipal Corporation, while the Municipal Commissioner serves as the administrative head.

• Examples of Municipal Corporations include the Delhi Municipal Corporation, Mumbai Municipal Corporation, etc.

• Chief Municipal Officer:

• The Chief Municipal Officer is the administrative head of a municipality.

• They are responsible for implementing the council's decisions and managing day-to-day administrative functions.

• This officer is usually appointed by the state government.

• Difference Between Chairman and Mayor:

• The Chairman is the political head of a Municipal Council, while the Mayor is the political head of a Municipal Corporation.

• The Chairman represents smaller towns, whereas the Mayor represents larger cities.

Q89. Answer: (c) Both conclusions (I) and (II) follow

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

Conclusions:

(I) Some hens are mynahs → Follow (As some hens are pigeons, all pigeons are crows and all crows are mynahs. As some part of hens is common with pigeons which whole comes in crows which whole comes in mynahs, therefore it is true)

(II) Some mynahs are pigeons → Follow (As all pigeons are crows and all crows are mynahs. As whole pigeons comes in crows which whole comes in mynahs, therefore it is true)

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

Hence, the correct answer is "Option 3".

Q90. Answer: (c) Sunrise on the Reaping

The correct answer is Sunrise on the Reaping.

Key Points

• Sunrise on the Reaping is a novel written by Suzanne Collins, renowned for her popular Hunger Games series.

• The book was published in 2025, marking her return to dystopian fiction.

• It explores themes of survival, societal control, and human resilience, consistent with Collins' storytelling style.

• Suzanne Collins is known for her gripping narratives that blend action, emotional depth, and thought-provoking commentary on social issues.

• The title "Sunrise on the Reaping" suggests a metaphorical connection to renewal and consequences, aligning with her previous works' thematic depth.

Additional Information

• Suzanne Collins:

• She is an American author best known for her globally successful Hunger Games trilogy.

• Her works are characterized by dystopian settings, strong protagonists, and commentary on societal issues.

• Collins has also written the "Underland Chronicles," a fantasy series for younger audiences.

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• Dystopian Fiction:
• This genre explores societies characterized by oppression, control, and the collapse of social structures.
• Popular themes include survival, resistance, and the examination of moral dilemmas.
• The Hunger Games Series:
• A trilogy consisting of "The Hunger Games," "Catching Fire," and "Mockingjay."
• The series has sold millions of copies worldwide and was adapted into a blockbuster film franchise.
• It focuses on Katniss Everdeen's journey through a brutal televised competition and her role in a larger rebellion.
• Impact of Suzanne Collins' Work:
• Her novels have sparked widespread interest in dystopian fiction among young adults.
• Collins' storytelling has influenced contemporary literature and film adaptations.
• She is recognized for addressing themes such as inequality, war, and human survival in compelling ways.

Q91. Answer: (a) 48.51%

Shortcut Trick

Net Discount for 26% and 29% = 26 + 29 − (26 × 29) ÷ 100 = 55 − 7.54 = 47.46%.

Now, combine 47.46% with 2% discount = 47.46 + 2 − (47.46 × 2) ÷ 100.

=> 49.46 − 0.9492 = 48.5108%.

Rounding up to two decimal places, we get 48.51%.

Therefore The correct answer is 48.51%.

Alternate Method

Given → Three consecutive discounts: d1 = 26%, d2 = 29%, and d3 = 2%.

Formulas: Net SP = MP × (100 − d1)% × (100 − d2)% × (100 − d3)% | Single Discount% = (MP − SP) ÷ MP × 100.

=> Let the Marked Price (MP) be 100.

=> Selling Price (SP) = 100 × (74 ÷ 100) × (71 ÷ 100) × (98 ÷ 100).

=> SP = 100 × 0.74 × 0.71 × 0.98 = 51.4892.

=> Single Equivalent Discount = MP − SP = 100 − 51.4892 = 48.5108%.

=> Rounded to two decimal places = 48.51%.

Therefore The correct answer is 48.51%.

Additional Information

Successive Discounts

When two or more discounts are applied one after another, they are called successive discounts. The total effective discount is always less than the simple sum of individual discounts.

Formula for Two Discounts

For two discounts a% and b%, the Single Equivalent Discount = [a + b − (ab ÷ 100)]%.

Q92. Answer: (a) 79/13 days

Shortcut Trick

Let total work be LCM(16, 10) = 80 units.

Efficiency of Ramesh = 5 and Suresh = 8.

Since Ramesh leaves 4 days early, add his 4-day potential work to the total: 80 + (5 × 4) = 100 units.

Total days = Adjusted Work ÷ Combined Efficiency = 100 ÷ (5 + 8) = 100/13 days.

Therefore The correct answer is 7(9/13) days.

Alternate Method

Given: Ramesh alone takes 16 days, Suresh alone takes 10 days.

Formula Used: Total Work = Time × Efficiency

Person	Days	Total Work	Efficiency
Ramesh	16	80	5
Suresh	10	8	

Calculations:

=> Let the total work be completed in x days.

=> Ramesh worked for (x − 4) days and Suresh worked for x days.

=> Work done by Ramesh + Work done by Suresh = 80

=> 5 × (x − 4) + 8 × x = 80

=> 5x − 20 + 8x = 80

=> 13x = 100

=> x = 100/13 = 7(9/13) days

Therefore The correct answer is 7(9/13) days.

Additional Information

Leaving Early vs Joining Late

If a person leaves 'n' days before completion, add (n × efficiency) to total work. If a person joins 'n' days late, it does not change the total work units but reduces their active time.

Pipes and Cisterns

Similar logic applies where efficiency of an outlet pipe is taken as negative, while an inlet pipe is positive.

Work and Wages

Wages are always distributed in the ratio of the actual work done by each individual (Efficiency × Time).

Q93. Answer: (c) 186

Decoding signs:

Sign	•	•	×	÷
Stands For	•	×	÷	•

Given: 109 ÷ 76 × 4 − 5 + 18 = ?

109 ÷ 76 × 4 − 5 + 18 = ? => 109 + 76 ÷ 4 × 5 - 18 = ?

=> 109 + 76 ÷ 4 × 5 - 18 = ?

=> 109 + 19 × 5 - 18 = ?

=> 109 + 95 - 18 = ?

=> 204 - 18 = ?

=> 186 = ?

Hence, "Option 3" is the correct answer.

Q94. Answer: (a) Son

Given:

1) R is the wife of A.

2) F is the son of A.

3) G is the sister of T.

4) T is the brother of F.

Thus, T is R's son.

Hence, the correct answer is "Option 1".

Q95. Answer: (b) 129

The logic followed here is:

Hence, "Option 2" is the correct answer.

Q96. Answer: (a) Punjab

The correct answer is Punjab.

Key Points

• The Ganga Plain, also known as the Indo-Gangetic Plain, spans across several northern and eastern states of India, including Uttar Pradesh, Bihar, Jharkhand, and West Bengal.

• Punjab is geographically located in the northwestern part of India and is primarily part of the Indus Basin, not the Ganga Basin.

• The Ganga Plain is characterized by fertile alluvial soil deposited by the Ganga River and its tributaries, supporting dense agriculture.

• Haryana, despite being geographically close to Punjab, has a small portion in the Yamuna-Ganga Plain region, making it partially included in the Ganga Plain.

• West Bengal and Bihar are major regions in the eastern Ganga Plain, receiving significant contributions from the Ganga and its tributaries.

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Additional Information

• Indo-Gangetic Plain:

• It is one of the largest and most fertile plains in the world, covering northern and eastern India, parts of Pakistan, Nepal, and Bangladesh.

• It is primarily drained by the Ganga, Brahmaputra, and Indus river systems.

• The plain plays a critical role in India's agriculture, producing major crops like wheat, rice, sugarcane, and pulses.

• Punjab Geography:

• Punjab lies in the Indus Basin and is mainly drained by the Sutlej, Beas, and Ravi rivers.

• The state is known for its extensive canal irrigation system and is called the "Granary of India" due to its agricultural dominance.

• Ganga River System:

• The Ganga River originates from the Gangotri Glacier in Uttarakhand and flows through several states before emptying into the Bay of Bengal.

• Major tributaries include Yamuna, Gandak, Kosi, and Son.

• The river basin supports over 500 million people, making it one of the most densely populated regions globally.

• Haryana's Ganga Plain Connection:

• Haryana is partially included in the Yamuna-Ganga Plain due to the Yamuna River flowing through the state.

• Its geographical connection to the Ganga Plain is limited but significant in terms of irrigation and agriculture.

Q97. Answer: (d) 631

Given: 215 ÷ 4 + 822 × 3 − 45 = ?

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

215 ÷ 4 + 822 × 3 − 45 = ? => 215 × 4 - 822 ÷ 3 + 45 = ?

=> 215 × 4 - 822 ÷ 3 + 45 = ?

=> 215 × 4 - 274 + 45 = ?

=> 860 + 45 - 274 = ?

=> 905 - 274 = ?

=> 631 = ?

Hence, "Option 4" is the correct answer.

Q98. Answer: (d) 2

According to the given information,

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

Hence, "Option 4" is the correct answer.

Q99. Answer: (b) Bhabar

The correct answer is Bhabar.

Key Points

• Bhabar is a narrow belt of 8-16 km in width lying parallel to the southern edge of the Shiwalik hills.

• This region is characterized by coarse alluvial deposits made up of pebbles and boulders brought down by the rivers descending from the Himalayas.

• It is marked by a high porosity of soil, causing streams and rivers to disappear and flow underground.

• The Bhabar zone is unsuitable for cultivation due to its rocky terrain and coarse soil texture.

• This belt serves as a transition zone between the hilly areas of the Shiwaliks and the fertile plains of the Terai region.

Additional Information

• Shiwalik Hills:

• Also known as the Outer Himalayas, the Shiwalik hills are the southernmost range of the Himalayas.

• They are composed of unconsolidated sediments, making them prone to erosion.

• The width of this range varies between 10 and 50 km, and its altitude ranges from 600 to 1500 meters.

• Terai Region:

• The Terai is a low-lying, marshy region lying south of the Bhabar belt.

• Unlike the Bhabar, the streams in this region re-emerge on the surface, making the area highly fertile and suitable for agriculture.

• The Terai is also home to rich biodiversity and dense forests, such as those found in Jim Corbett National Park.

• Doab:

• A doab refers to the fertile land between two converging rivers.
• For example, the Ganga-Yamuna Doab is one of the most agriculturally productive regions in India.
• Alluvial Deposits:
• Alluvium is a loose soil or sediment deposited by rivers, typically consisting of sand, silt, and clay.
• Regions like the Indo-Gangetic plain owe their fertility to alluvial deposits brought by Himalayan rivers.

Q100. Answer: (a) Bibi-ka-Maqbara

The correct answer is Bibi-ka-Maqbara.

Key Points

• Bibi-ka-Maqbara is a mausoleum located in Aurangabad, Maharashtra, and was built by Aurangzeb in memory of his first wife, Dilras Banu Begum.
• The construction of Bibi-ka-Maqbara began in 1651 and was completed in 1661 under the supervision of Aurangzeb's son, Azam Shah.
• It is often referred to as the "Taj of the Deccan" due to its resemblance to the Taj Mahal, although it is less grand in scale and detailing.
• The architecture was designed by Ata-ullah, the son of Ustad Ahmad Lahauri, who was the chief architect of the Taj Mahal.
• The structure is primarily made of marble and features intricate carvings, showcasing a blend of Mughal architectural styles.

Additional Information

• Aurangzeb's Architectural Legacy:
• Aurangzeb was not as prolific a patron of architecture as his predecessors; he focused more on military campaigns and administration.
• Bibi-ka-Maqbara is one of the few significant architectural projects commissioned during his reign.
• Unlike the Taj Mahal, Aurangzeb restricted excessive expenditure on monuments, reflecting his austere approach.
• Mughal Architecture:
• Mughal architecture is a blend of Islamic, Persian, Turkish, and Indian architectural styles, characterized by domes, arches, minarets, and intricate ornamentation.
• Prominent examples include the Taj Mahal, Humayun’s Tomb, and Jama Masjid.
• Other Monuments Built by Aurangzeb:
• Aurangzeb built several mosques, such as the Badshahi Mosque in Lahore and the Moti Masjid in Delhi.
• These structures were more functional and less ornate compared to those built by earlier Mughal emperors.
• Comparison with Taj Mahal:
• Bibi-ka-Maqbara’s resemblance to the Taj Mahal highlights the influence of Shah Jahan’s architectural style on Aurangzeb’s era.
• However, the materials used and the scale of construction were comparatively modest due to budgetary constraints imposed by Aurangzeb.

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