RRB NTPC (UG) CBT-I Official Paper (Held On: 04 Sept, 2025 Shift 1) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Which reformer is known for his efforts to promote widow remarriage and women's education in Bengal?

(a) Keshab Chandra Sen
(b) Ishwar Chandra Vidyasagar
(c) Debendranath Tagore
(d) Swami Vivekananda

Q2. Which of the following Articles of the Indian Constitution provides for the power of the President to specify the Scheduled Tribes under the Constitution?

(a) Article 342
(b) Article 343
(c) Article 336
(d) Article 340

Q3. Which of the following Defence Public Sector Undertakings (DPSUs) were granted 'Miniratna' Category-I status by Defence Minister Rajnath Singh in May 2025?

(a) Bharat Dynamics Limited (BDL)
(b) Hindustan Aeronautics Limited (HAL)
(c) Bharat Electronics Limited (BEL)
(d) Munitions India Limited (MIL)

Q4. In 2025, the Central government selected which of the following start-ups to build India's first indigenous artificial intelligence (AI) large language model (LLM)?

(a) Sarvana
(b) Sarvam
(c) Srijan
(d) Sarvshresht

Q5. What does the abbreviation 'MAN' stand for in computer networking?

(a) Mobile Area Network
(b) Medium Access Network
(c) Main Access Node
(d) Metropolitan Area Network

Q6. As of June 2025, how many languages are listed in the Eighth Schedule of the Indian Constitution?

(a) 24
(b) 18
(c) 22
(d) 14

Q7. President Droupadi Murmu conferred how many Kirti Chakras, including four posthumous, during Phase-I of the Defence Investiture Ceremony 2025 in May 2025?

(a) Fifteen
(b) Nine
(c) Six
(d) Twelve

Q8. Tuhin Kanta Pandey succeeded whom as the chairman of the Securities and Exchange Board of India (SEBI) in March 2025?

(a) Ajay Tyagi
(b) UK Sinha
(c) Madhabi Puri Buch
(d) CB Bhave

Q9. Which of the following states was NOT formed through the State Reorganisation Act of 1956?

(a) Rajasthan State
(b) Goa State
(c) Mysore State
(d) Bombay State

Q10. Which Article of the Indian Constitution directs the State for promotion of cottage industries in rural areas?

(a) Article 41
(b) Article 36
(c) Article 55
(d) Article 43

Q11. Which of the following is the first African country to sign the International Solar Alliance (ISA) in April 2025?

(a) Senegal
(b) Lesotho
(c) Mauritius
(d) Egypt

Q12. Which of the following plateaus lies between the Western Ghats and Eastern Ghats?

(a) Chhota Nagpur Plateau
(b) Deccan Plateau
(c) Malwa Plateau
(d) Meghalaya Plateau

Q13. Which organisation unveiled the strategic report titled 'Designing a Policy for Medium Enterprises' emphasising their role in India’s development?

(a) Reserve Bank of India
(b) Ministry of MSME
(c) Confederation of Indian Industry (CII)
(d) NITI Aayog

Q14. Which Article of the Indian Constitution deals with the distribution of legislative powers between the Union and the States?

(a) Article 368
(b) Article 240
(c) Article 280
(d) Article 246

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Q15. What pigment do petunias have that gives them a reddish-purple colour in an acidic environment (low pH)?

(a) Anthocyanins
(b) Carotenes
(c) Betalains
(d) Lycopene

Q16. Which of the following organisations oversees the Kutiyattam Kendra located in Thiruvananthapuram, Kerala, India?

(a) Kerala Tourism Department
(b) Ministry of Education
(c) UNESCO
(d) Ministry of Culture

Q17. Which of the following officers managed stores and the supply of weapons like spears and swords during the Gupta period?

(a) Ranabhandagarika
(b) Sandhivigrahika
(c) Kumaramatya
(d) Mahadandanayaka

Q18. Which two places are in the news due to the approval of Greenfield airports for better connectivity by the Central Government on 5 May 2025?

(a) Pakyong and Kalaburagi
(b) Navi Mumbai and Itanagar
(c) Kota and Puri
(d) Shirdi and Kannur

Q19. Who is the director of the Indian entry at the 78th Cannes Film Festival named ‘Homebound’, starring Janhvi Kapoor, Ishaan Khatter and Vishal Jethwa?

(a) Neeraj Ghaywan
(b) Karan Johar
(c) Anurag Kashyap
(d) Anurag Basu

Q20. Why is the net sown area low in hilly states like Himachal Pradesh and Uttarakhand?

(a) Due to urban expansion
(b) Because of steep slopes and thin soil layers
(c) Because of poor soil fertility
(d) Due to frequent floods

Q21. Which one of the following Sustainable Development Goals (SDGs) aims to ensure access to affordable, reliable, sustainable and modern energy for all?

(a) Goal 12
(b) Goal 5
(c) Goal 7
(d) Goal 10

Q22. According to an official report released in April 2025, AI-based real-time forest monitoring system has been implemented for the first time in which state sensitive forest divisions?

(a) Assam
(b) Odisha
(c) Gujarat
(d) Madhya Pradesh

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Q23. Which of the following is a primary memory of a computer?

(a) Hard Disk
(b) CD-ROM
(c) Floppy Disk
(d) RAM

Q24. Which mineral helps in the formation of insulin granules, digestion, metabolism and functioning of the male prostate?

(a) Iron
(b) Zinc
(c) Phosphorus
(d) Nickel

Q25. In India, Red Bull India Private Limited (RBIL) has imported and sold Red Bull Energy Drink and its variants since _____.

(a) 2005
(b) 2007
(c) 2000
(d) 2002

Q26. Which of the following Indian space missions captured its first image of a solar flare in February 2025?

(a) Aditya-L1
(b) AstroSat
(c) Mangalyaan-2
(d) Chandrayaan-3

Q27. In 1947, the Indian economy was marked by deep poverty. Which sector dominated the Indian economy at the time of independence?

(a) Agricultural sector
(b) Industrial sector
(c) Services sector
(d) Manufacturing sector

Q28. In which year did India officially start economic liberalisation?

(a) 1995
(b) 2000
(c) 1985
(d) 1991

Q29. Select the right bank tributary of the Indus River system.

(a) Jhelum River
(b) Ravi River
(c) Kabul River
(d) Chenab River

Q30. What is the main function of carbohydrates in the body?

(a) It is crucial for growth.
(b) It regulates hormones.
(c) It provides energy
(d) It insulates the body.

Q31. The Lower Palaeolithic period in India, including the Acheulian phase, spans approximately how many years BP?

(a) 6,00,000–1,50,000 years BP
(b) 1,65,000–31,000 years BP
(c) 1,00,000–10,000 years BP
(d) 40,000–12,000 years

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Q32. Who organises Lok Adalats in India?

(a) Bar Council of India
(b) National and State Legal Services Authorities
(c) Law Commission of India
(d) Advocate General of State

Q33. Which novel earned Percival Everett the Pulitzer Prize for Fiction in 2025?

(a) Erasure
(b) The Trees
(c) James
(d) Glyph

Q34. In which of the following institutes was ‘Shri S. Ramakrishnan Centre of Excellence in Fluid and Thermal Science Research’ launched in March 2025?

(a) Indian Institute of Technology, Madras
(b) Indian Institute of Technology, Kanpur
(c) Indian Institute of Technology, Bombay
(d) Indian Institute of Technology, Delhi

Q35. Which of the following states of India has Konkani as a prominently spoken language?

(a) Assam
(b) Tripura
(c) Goa
(d) Arunachal Pradesh

Q36. Which of the following is a major difference between planted and natural vegetation?

(a) Presence of fruits
(b) Place of origin
(c) Human supervision involved
(d) Number of leaves

Q37. Who is the 52nd Chief Justice of India?

(a) Justice DY Chandrachud
(b) Justice NV Ramana
(c) Justice BR Gavai
(d) Justice Sanjiv Khanna

Q38. What does the term 'net sown area' refer to?

(a) Total area cultivated with crops during the year
(b) Total area under irrigation
(c) Land covered with forests
(d) Land left uncultivated for more than five years

Q39. What is the main aim of globalisation?

(a) Limit foreign trade
(b) Reduce employment
(c) Increase local production
(d) Integrate the Indian economy with the world

Q40. The Non-cooperation Movement in 1920 included all the following, EXCEPT:

(a) violent attacks on officials
(b) refusal to pay taxes
(c) boycott of British courts
(d) closure of schools and colleges

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MATHEMATICS

Q41. In triangle ABC, BD ? AC at D and angle DBC = 60°. E is a point on BC such that angle CAE = 49°. What is the measure of angle AEB?

(a) 80°
(b) 87°
(c) 85°
(d) 79°

Q42. The average weight of Rupesh, Mandar and Ketan is 45 kg. If the average weight of Rupesh and Mandar is 43 kg and that of Mandar and Ketan is 49 kg, then the weight of Mandar (in kg) is:

(a) 64
(b) 49
(c) 69
(d) 59

Q43. Simplify the following.

$2((5/2)x^2-28x+17)-5(x^2+6x-18)$

(a) −86x + 124
(b) −86x − 124
(c) 86x + 124
(d) 86x − 124

Q44. Pipe A can fill a tank in 17 hours, pipe B can fill the same tank in 24 hours and pipe C can fill the same tank in 18 hours. The time taken by them to fill the same tank if they operate together is::

(a) 1078/191 hours
(b) 678/191 hours
(c) 1678/191 hours
(d) 1378/191 hours

Q45. Neha, Rajat, and Avinash invest Rs. 1,430, Rs. 1,680, and Rs. 1,340, respectively, to start a business. If the profit at the end of the year is Rs. 1,780, then what is the share of Avinash in the profit?

(a) Rs. 537
(b) Rs. 536
(c) Rs. 533
(d) Rs. 538

Q46. By how much is 65% of 75 greater than 3/5 of 25?

(a) 30.75
(b) 31.75
(c) 27.75
(d) 33.75

Q47. The LCM of the numbers 4.7 and 0.04 is:

(a) 9.4
(b) 0.94
(c) 94
(d) 0.094

Q48. A woman travels 488 km at 61 km/hr, a second distance of 468 km at 78 km/hr and a third distance of 210 km at 35 km/hr. Find her average speed for the whole journey (in km/hr).

(a) 61.1
(b) 68.8
(c) 59.7
(d) 58.3

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Q49. If the third proportional of 50 and 30 is x, then what is the value of x?

(a) 21
(b) 15
(c) 20
(d) 18

Q50. If 3 times Mary's present age is 22 years more than 5 times Dia's present age, and 3 times Dia's present age is 2 years less than Mary's present age, then what is the difference (in years) between the ages of Mary and Dia?

(a) 7
(b) 13
(c) 10
(d) 15

Q51. If the radius of a sphere is increased to twelve times its original radius, then by how many times does its surface area increase?

(a) 128
(b) 144
(c) 64
(d) 164

Q52. A man walks to a viewpoint and returns to the starting point by his car maintaining constant speed and thus takes a total time of 4 hours 30 minutes. He would have gained 2 hours by driving both ways. How long would it have taken for him to walk both ways with same walking speed?

(a) 6 hours 30 minutes
(b) 7 hours 30 minutes
(c) 5 hours 15 minutes
(d) 6 hours 45 minutes

Q53. The value of $67 - 9 \times [4 + 3 \times \{ 16 - 8 (6 - 5) \times 2\} \div 32]$ is:

(a) 40
(b) 25
(c) 31
(d) 47

Q54. The cost of 10 pens and 3 pencils is Rs. 129. If the cost of a pen decreases by Rs. 6 and the cost of a pencil increases by Rs. 9, then the cost of 8 pens and 2 pencils is Rs. 72. What is the original cost of 9 pens and 16 pencils?

(a) Rs. 156
(b) Rs. 160
(c) Rs. 155
(d) Rs. 161

Q55. Find the simple interest (in Rs.) on Rs. 1,200 at an interest rate of 3% per month in 4 months.

(a) 24
(b) 12
(c) 32
(d) 144

Q56. A book has a marked price of Rs. 500. During a festive sale, it is sold at a 10% discount. What is the amount of discount given?

(a) Rs. 60
(b) Rs. 50
(c) Rs. 45
(d) Rs. 40

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Q57. The value of $2^2+\sqrt{(5^2)}-3\sqrt{25}-10$ is

(a) -10
(b) -16
(c) -8
(d) -7

Q58. The sides of a triangle are 72 cm, 90 cm, and 54 cm. What is its area? (in cm^2)

(a) 1973
(b) 1944
(c) 1912
(d) 1954

Q59. The simple interest on a certain sum for 91/2 years at the rate of 5.9% per annum is Rs. 6,726. What will be the amount payable on the same sum at the rate of 5.6% per annum simple interest in 31/7 years?

(a) Rs. 14,095
(b) Rs. 14,100
(c) Rs. 14,104
(d) Rs. 14,112

Q60. The H.C.F. and the L.C.M. of two numbers are 11 and 440, respectively. If one of the numbers is 55, find the other one.

(a) 10
(b) 70
(c) 14
(d) 88

Q61. Manisha bought a toy for Rs. 849, decorated it at a cost of Rs. 6 and sold the toy for Rs. 441. Find the loss or profit percentage.

(a) 920/19% loss
(b) 920% loss
(c) 930/19% Profit
(d) 920/19% profit

Q62. The value of $\sqrt{169}+\sqrt{0.0196}-\sqrt{4.41}$ is

(a) 4.52
(b) 5.64
(c) 11.04
(d) 6.17

Q63. Abdul and Mohsin together invested Rs. 79,200 in a business. At the end of the year, out of a total profit of Rs. 14,400, Mohsin's share was Rs. 2,600. What was the difference between their investments?

(a) Rs. 52,000
(b) Rs. 50,600
(c) Rs. 49,800
(d) Rs. 51,400

Q64. The income of Raman is Rs. 91,700. He saves 25% of his income. If his income increases by 27% and expenditure increases by 40%, then his savings will:

(a) decrease by Rs. 2,751
(b) increase by Rs. 2,753
(c) decrease by Rs. 2,753
(d) increase by Rs. 2,754

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Q65. Shifa can do a certain piece of work in 30 days. Shifa and Afiya can together do the same work in 18 days, and Shifa, Afrya and Mariyam can do the same work together in 9 days. In how many days can Shifa and Mariyam do the same work?

(a) 40/5
(b) 37/4
(c) 53/6
(d) 45/4

Q66. If cosec θ + sin θ = 2, then find the value of cosec^6 θ + sin^6 θ.

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

Q67. The value of $2^3-3^2+(2/2)^2-2+4\times 7=$ _____

(a) 28
(b) 35
(c) 31
(d) 26

Q68. An article listed at Rs. 500 is sold at successive discounts of 10% and 14%. The buyer wants to sell it at a profit of 15% after offering a 10% discount. What should be his list price (in Rs.)?

(a) 484.50
(b) 485
(c) 494.50
(d) 474

Q69. A trader claims to sell pulses at a profit of 48%, but also dishonestly uses a weight which is 12% less than what is mentioned on it. Find the total percentage of profit earned by the trader. (Round off the answer to the nearest whole number.)

(a) 63%
(b) 71%
(c) 68%
(d) 72%

Q70. The sum of five numbers is 655. The average of the first two numbers is 80 and the third number is 108. Find the average of the remaining two numbers.

(a) 189
(b) 193.5
(c) 194.5
(d) 188

GENERAL INTELLIGENCE AND REASONING

Q71. If 1 is added to each even digit and 2 is subtracted from each odd digit in the number 4562734, what will be difference between the highest and lowest digits in the number thus formed?

(a) 5
(b) 4
(c) 6
(d) 7

Q72. In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

CURD - RCUD - DRUC

KIDS - DKIS - SDIK

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(a) SLAY - ASLY - LAYS
(b) PEAT - EPAT - TEAP
(c) TEAM - TAEM - MAET
(d) WASH - SWAH - HSAW

Q73. Seven people, I, J, K, L, M, N and O, are sitting in a row, facing north. Only two people sit to the left of K. Only three people sit between K and L. Only one person sits between L and J. N sits to the immediate left of I. M is not an immediate neighbour of L. How many people sit to the right of O?

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

Q74. HLOY is related to KNRA in a certain way based on the English alphabetical order. In the same way, TTAG is related to WVDI. To which of the given options is CZJM related, following the same logic?

(a) FBOM
(b) FOMB
(c) FBMO
(d) FMOB

Q75. Riya starts from Point P and drives 8 km towards the south. Then she takes a right turn, drives 11 km, she turns right again and drives 14 km. She then takes a right turn and drives 15 km. Then she takes left turn and drives 2 km, she takes a left turn again and drives 4 km and stops at Point Q. How far (shortest distance) and towards which direction should she drive in order to reach Point P again? (All turns are 90-degree turns only unless specified.)

(a) 4 km towards the south
(b) 4 km towards the north
(c) 8 km towards the south
(d) 6 km towards the north

Q76. In a certain code language, ‘DONT’ is coded as ‘1097’ and ‘NATO’ is coded as ‘0187’. What is the code for ‘A’ in the given code language?

(a) 7
(b) 0
(c) 8
(d) 1

Q77. This question is based on five, four-digit numbers given below.

(Left) 4138 2345 6367 5353 1276 (Right)

(Example: 6975 – First digit = 6, second digit = 9, third digit = 7 and fourth digit = 5)

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

What will be the resultant if the second digit of the second largest number is multiplied to the second digit of the largest number?

(a) 5
(b) 6
(c) 7
(d) 9

Q78. 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) KO-RN
(b) NR-UP
(c) AE-HC
(d) QU-XS

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Q79. Town T is to the west of Town S. Town U is to the south of Town T. Town V is to the west of Town U. Town W is to the south of Town V. Town X is to the west of Town W. What is the position of Town X with respect to Town S?

(a) Southwest
(b) Southeast
(c) Northwest
(d) Northeast

Q80. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

USR ROT OKV LGX ?

(a) IDS
(b) ICZ
(c) JWZ
(d) LKX

Q81. What should come in place of the question mark (?) in the given series?

561 560 562 561 563 562 564 ?

(a) 562
(b) 564
(c) 563
(d) 565

Q82. Seven boxes F, G, H, M, N, O and P are kept one over the other but not necessarily in the same order. O is kept immediately above F. G is kept immediately above M. Only P is kept above N. Only two boxes are kept above O. G is not kept at third position from the bottom. How many boxes are kept between H and P?

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

Q83. If ‘A’ stands for ‘÷’, ‘B’ stands for ‘×’, ‘C’ stands for ‘+’ and ‘D’ stands for ‘−’, then what will come in place of the question mark (?) in the following equation?

32 B 5 C 63 B 5 D 89 C 9 A 9 D 7 = ?

(a) 293
(b) 380
(c) 349
(d) 308

Q84. In a certain code language, ‘LOAD’ is coded as ‘5364’ and ‘GOLD’ is coded as ‘4136’. What is the code for ‘G’ in the given code language?

(a) 6
(b) 4
(c) 1
(d) 3

Q85. In a certain code language,

'A ¥ B' means ‘A is the father of B’,

'A # B' means ‘ A is the brother of B’,

'A % B' means ‘A is the son of B’ and

'A = B' means ‘A is the wife of B’.

How is A related to D if 'A = S # G % E ¥ D'?

(a) Brother's wife
(b) Sister's brother
(c) Sister's son
(d) Brother's son

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Q86. Karan, Shiv, Ritu, Himani, Gunjan and Pari are sitting in a straight line, facing north. Karan sits third to the left of Himani. Himani sits second from the right end. Pari sits to the immediate left of Gunjan. Shiv does not sit next to Karan. Who sits second to the right of Gunjan?

(a) Karan
(b) Shiv
(c) Ritu
(d) Himani

Q87. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All forks are spoons.

Some forks are caps.

Conclusions (I): Some spoons are caps.

Conclusions (II): All caps are forks.

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

Q88. RBNH is related to LVHB in a certain way based on the English alphabetical order. In the same way, TDPJ is related to NXJD. To which of the given options is BLXR related, following the same logic?

(a) VFLR
(b) VRFL
(c) VFRL
(d) VLRF

Q89. 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.)

(48, 26, 15)

(88, 46, 25)

(a) (12, 6, 7)
(b) (58, 34, 19)
(c) (36, 20, 8)
(d) (24, 14, 9)

Q90. Each of the digits in the number 67849315 is arranged in ascending order from left to right. What will be the sum of the digits which are second from the left and third from the right in the new number thus formed?

(a) 9
(b) 10
(c) 7
(d) 11

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

(Left) 6 \ & > 3 @ 8 * & @ 7 1 ^ @ 4 ? \ ? 4 5 < (Right)

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

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

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(d) One

Q92. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All gardens are forests.

All forests are meadows.

Conclusions:

(I) All gardens are meadows.

(II) All meadows are forests.

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

Q93. Mr. Toni ranked 94th from the bottom and 65th from the top in his class. How many students are there in his class?

(a) 159
(b) 156
(c) 157
(d) 158

Q94. What should come in place of the question mark (?) in the given series?

19 42 78 122 179 ?

(a) 234
(b) 244
(c) 243
(d) 204

Q95. 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) NIO
(b) KFM
(c) TOV
(d) QLS

Q96. What should come in place of the question mark (?) in the given series?

154 181 208 ? 262 289

(a) 242
(b) 235
(c) 228
(d) 260

Q97. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

LSP 15 OOO 12 RKN 9 UGM 6 ?

(a) DLV 4
(b) XCL 3
(c) DSR 9
(d) XLC 7

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Q98. 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 pair.)

(a) KO-RW
(b) IM-PT
(c) MQ-TX
(d) FJ-MQ

Q99. What will come in place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

14 ÷ 4 + 78 × 13 − 13 = ?

(a) 65
(b) 55
(c) 63
(d) 58

Q100. Raj ranked 35th from the top and 27th from the bottom in his class. How many students are there in his class?

(a) 60
(b) 62
(c) 63
(d) 61

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Ishwar Chandra Vidyasagar

The correct answer is Ishwar Chandra Vidyasagar.

Key Points

• Ishwar Chandra Vidyasagar was a prominent Indian social reformer, educator, and writer who played a crucial role in advocating for widow remarriage and women's education during the 19th century.

• He was instrumental in the passage of the Hindu Widows' Remarriage Act, 1856, which legalized widow remarriage in India.

• Vidyasagar worked tirelessly to improve the status of women in society by promoting education for girls and establishing schools for them, including the first women's college in Bengal.

• He simplified and modernized the Bengali alphabet and script, making education more accessible to the masses.

• Known for his progressive and humanitarian views, Vidyasagar was deeply committed to eradicating social evils such as child marriage and gender inequality.

Additional Information

• Keshab Chandra Sen:

• Keshab Chandra Sen was a social reformer and a prominent figure in the Brahmo Samaj movement.

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• He worked towards the abolition of caste discrimination and untouchability and advocated for women's rights, including education and upliftment.

• While he contributed significantly to social reforms, his efforts were not specifically focused on widow remarriage or the promotion of women's education in Bengal.

• Debendranath Tagore:

• Debendranath Tagore was an Indian philosopher and religious reformer associated with the Brahmo Samaj.

• He emphasized spiritual and moral reform in society but did not actively campaign for widow remarriage or women's education.

• Debendranath is also known for his contributions to Indian philosophy and his role as the father of Rabindranath Tagore.

• Swami Vivekananda:

• Swami Vivekananda was a spiritual leader and philosopher who popularized Indian philosophy and spirituality in the West.

• He advocated for social reform, including the upliftment of women, but his primary focus was on spiritual awakening and promoting Vedanta philosophy.

• His contributions were significant but did not center around widow remarriage or women's education.

Q2. Answer: (a) Article 342

The correct answer is Article 342.

Key Points

• Article 342 of the Indian Constitution empowers the President to specify the Scheduled Tribes in consultation with the Governor of the concerned state.

• It allows the President to notify specific tribes or tribal communities as Scheduled Tribes for the purpose of granting them special rights and privileges.

• The Parliament has the authority to include or exclude any tribe from the Scheduled Tribes list after the President's initial notification.

• Scheduled Tribes are provided with certain constitutional safeguards to ensure their socio-economic development and to protect their rights.

• The provisions under Article 342 aim to address historical injustices and promote the welfare of tribal communities across India.

Additional Information

• Article 343

• It deals with the official language of the Union of India.

• Article 343(1) specifies that the official language of the Union shall be Hindi in Devanagari script.

• The use of the English language for official purposes was to continue for 15 years from the commencement of the Constitution, but it has been extended through subsequent legislation.

• Article 336

• This article provides special provisions for the Anglo-Indian community concerning services in certain government sectors.

• It ensures reservations for Anglo-Indians in the services of the Union and the states for a specified period.

• This provision was created to safeguard the employment opportunities of Anglo-Indians during the formative years of independent India.

• Article 340

• It empowers the President to appoint a commission to investigate the conditions of socially and educationally backward classes.

• The commission is tasked with suggesting measures to improve the conditions of these classes and recommending steps for their advancement.

• This article forms the basis for several welfare schemes and policies aimed at uplifting backward classes in India.

Q3. Answer: (d) Munitions India Limited (MIL)

The correct answer is Munitions India Limited (MIL).

Key Points

• Munitions India Limited (MIL), one of the seven new Defence Public Sector Undertakings (DPSUs) formed after the corporatization of the Ordnance Factory Board (OFB), was granted 'Miniratna' Category-I status in May 2025.

• The 'Miniratna' status allows greater financial and operational autonomy to MIL, enabling it to expand its operations and improve efficiency.

• MIL specializes in the manufacture of ammunition and explosives, catering to the needs of the Indian Armed Forces, paramilitary forces, and other customers.

• This recognition as a 'Miniratna' DPSU reflects the company's strong financial performance and strategic importance in India's defense manufacturing sector.

• The status empowers MIL to make decisions regarding capital expenditure, joint ventures, and technology acquisitions within

specified limits without seeking government approval.

Additional Information

• Bharat Dynamics Limited (BDL)

• BDL is a Miniratna Category-I DPSU that manufactures guided missiles and allied defense equipment.

• The company primarily serves the Indian Armed Forces and is one of the leading missile manufacturers in India.

• BDL has been instrumental in the indigenization of missile technology in India, including Akash, Nag, and BrahMos systems.

• Hindustan Aeronautics Limited (HAL)

• HAL is a Navratna Public Sector Undertaking and one of the largest aerospace and defense companies in India.

• It is engaged in the design, manufacture, and assembly of aircraft, helicopters, and related systems.

• HAL has played a critical role in the development of indigenous aircraft such as the Tejas Light Combat Aircraft (LCA).

• Bharat Electronics Limited (BEL)

• BEL is a Navratna DPSU specializing in electronics and communication equipment for the defense sector.

• It manufactures radar systems, communication systems, and electronic warfare systems, among other products.

• BEL has been pivotal in enhancing India's self-reliance in defense electronics and supporting the Make in India initiative.

• Miniratna Status

• The 'Miniratna' status is granted to public sector enterprises in India based on their financial performance and operational efficiency.

• Miniratna Category-I companies can incur capital expenditure up to Rs. 500 crore without government approval.

• The status is aimed at providing greater autonomy to these enterprises, enabling them to compete effectively and contribute to India's economic growth.

Q4. Answer: (b) Sarvam

The correct answer is Sarvam.

Key Points

• Sarvam was selected by the Central Government in 2025 to create India's first indigenous artificial intelligence (AI) large language model (LLM).

• The initiative aims to build an AI-powered LLM to enable India to achieve technological self-reliance in the field of artificial intelligence.

• Sarvam focuses on developing AI systems that are tailored to Indian languages, cultural contexts, and unique societal needs.

• The project aligns with India's vision for Aatmanirbhar Bharat (self-reliant India) in the digital and AI domain.

• The platform will integrate cutting-edge technologies such as natural language processing (NLP), machine learning (ML), and neural networks to support diverse industries like healthcare, education, and governance.

Additional Information

• Sarvana

• Sarvana is a fictional or hypothetical name in this context and does not represent any known AI-related startup or initiative.

• It is not associated with any government-backed project in the AI domain.

• Srijan

• Srijan refers to various initiatives or organizations in India, primarily in the context of innovation and development.

• It is not directly linked to AI development or large language models.

• However, the term "Srijan" is often used for projects focused on technology, entrepreneurship, and skill development.

• Sarvshresht

• Sarvshresht, meaning "the best" in Hindi, is a name that symbolizes excellence.

• Currently, no credible information links Sarvshresht to AI-related startups or the development of LLMs.

• The name could potentially represent future initiatives in India's technological advancements.

Important Points

• Large Language Models (LLMs) are advanced AI systems capable of processing and generating human-like text. Examples include GPT (Generative Pre-trained Transformer) models developed by OpenAI.

• India's focus on indigenous LLMs stems from its need to address unique linguistic diversity, cultural requirements, and data security concerns.

• Such projects represent a critical step in strengthening India's position in the global AI landscape while promoting research and development within the country.

Q5. Answer: (d) Metropolitan Area Network

The correct answer is Metropolitan Area Network.

Key Points

• A Metropolitan Area Network (MAN) is a type of computer network that spans a geographic area larger than a Local Area Network (LAN) but smaller than a Wide Area Network (WAN).

• Typically, a MAN covers a city or a large campus, connecting multiple LANs within the region.

• MANs are often used to link buildings, offices, or networks within the same city or metropolitan area to facilitate seamless communication.

• They use high-capacity communication links such as fiber optics to provide fast data transfer and connectivity.

• MANs play a critical role in connecting different parts of urban areas and enabling efficient data exchange between organizations or public systems.

Additional Information

• Mobile Area Network:

• Mobile Area Network is not a standard term in computer networking.

• It could imply a network that operates on mobile devices or mobile infrastructure, but it is not officially recognized in networking terminologies.

• Medium Access Network:

• This term does not exist in the context of computer networking.

• However, "Medium Access Control (MAC)" is a sublayer of the data link layer in the OSI model responsible for regulating how data is transmitted over a shared medium.

• Main Access Node:

• This term is also not a standard abbreviation or concept in computer networking.

• Access nodes in a network are devices or points that provide connectivity to the main network, but the term "Main Access Node" is not widely used.

Important Points

• Computer Networking:

• Computer networks enable communication and data sharing between devices, such as computers, servers, and other hardware.

• Networks are classified into several types based on their geographic scope, such as Local Area Network (LAN), Metropolitan Area Network (MAN), and Wide Area Network (WAN).

• Each type of network serves specific purposes, with MAN acting as an intermediary between LAN and WAN in terms of size and functionality.

Q6. Answer: (c) 22

The correct answer is 22.

Key Points

• The Eighth Schedule of the Indian Constitution recognizes 22 official languages as of June 2025.

• Originally, the Eighth Schedule included 14 languages when the Constitution of India was adopted in 1950.

• Subsequent amendments have added more languages to the list. For instance, the 21st Amendment Act of 1967 included Sindhi, while the 71st Amendment Act of 1992 added Konkani, Manipuri, and Nepali.

• The most recent addition was made through the 92nd Amendment Act of 2003, which included Bodo, Dogri, Maithili, and Santhali, bringing the total to 22 languages.

• The languages listed in the Eighth Schedule are considered to hold special cultural and linguistic significance in India and are eligible for promotion and development under Article 351 of the Constitution.

Additional Information

• The Eighth Schedule of the Indian Constitution primarily deals with the recognition and promotion of languages in India.

• The inclusion of a language in this schedule enables its development, preservation, and promotion through various government initiatives.

• It also provides a basis for its use in official communication, education, and other spheres of public life.

• Initially, the Eighth Schedule contained only 14 languages when the Indian Constitution was adopted in 1950. These languages included Hindi, Bengali, Tamil, Telugu, Urdu, and others.

• The Eighth Schedule listed 18 languages after the inclusion of Konkani, Manipuri, and Nepali through the 71st Amendment Act of 1992.

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Q7. Answer: (c) Six

The correct answer is Six.

Key Points

• President Droupadi Murmu conferred a total of six Kirti Chakras during Phase-I of the Defence Investiture Ceremony 2025.

• Out of these six awards, four were conferred posthumously, honoring the bravery and sacrifices of personnel who lost their lives in the line of duty.

• The Kirti Chakra is India's second-highest peacetime gallantry award, awarded for acts of valor, self-sacrifice, or extraordinary courage away from the battlefield.

• The Defence Investiture Ceremony is an annual event where the President of India, as the Supreme Commander of the Armed Forces, honors the exceptional contributions of military personnel.

• This ceremony showcases the nation’s gratitude towards the armed forces and recognizes their immense contributions to national security and peace.

Additional Information

• Kirti Chakra:

• It was established on January 4, 1952, and is awarded for conspicuous gallantry in peacetime.

• The award can be conferred on both military and civilian personnel.

• The medal is circular in shape, and the design includes a replica of Ashoka's Chakra on the obverse side and the words “Kirti Chakra” inscribed in Hindi and English on the reverse side.

• Defence Investiture Ceremony 2025

• The recipients of the Kirti Chakra included Major Malla Rama Gopal Naidu, Major Manjit, Rifleman Ravi Kumar (Posthumous), Colonel Manpreet Singh, SM (Posthumous), Deputy Superintendent of Police Himayun Muzzammil Bhat (Posthumous), and Naik Dilwar Khan (Posthumous).

Q8. Answer: (c) Madhabi Puri Buch

The correct answer is Madhabi Puri Buch.

Key Points

• Madhabi Puri Buch was appointed as the first woman chairperson of the Securities and Exchange Board of India (SEBI) on March 1, 2022.

• She succeeded Ajay Tyagi, who completed his term as the SEBI chairman.

• Madhabi Puri Buch is a former executive director at ICICI Bank and has also served as a whole-time member of SEBI.

• Her leadership marked a historic milestone in the history of SEBI, reflecting the increasing representation of women in top regulatory positions.

• She is known for her technology-driven approach towards enhancing transparency and efficiency in the financial markets.

Additional Information

• Ajay Tyagi:

• Ajay Tyagi served as the chairman of SEBI from March 1, 2017, to February 28, 2022.

• He focused on reforms in the mutual fund industry and enhanced measures to protect investors.

• Under his tenure, SEBI implemented several regulations to strengthen corporate governance and improve market transparency.

• UK Sinha:

• UK Sinha was the SEBI chairman from February 2011 to March 2017.

• He played a key role in regulating alternative investment funds and tightening norms for insider trading.

• He introduced several measures to safeguard retail investors and boost market confidence.

• CB Bhave:

• CB Bhave served as the SEBI chairman from February 2008 to February 2011.

• During his tenure, SEBI introduced measures to improve transparency in IPO processes and strengthened regulations for credit rating agencies.

• Securities and Exchange Board of India (SEBI):

• SEBI is the regulatory body for the securities and capital markets in India.

• It was established in 1988 and became a statutory body in 1992 under the SEBI Act.

• Its primary functions include protecting investor interests, regulating the securities market, and promoting the development of the market.

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Q9. Answer: (b) Goa State

The correct answer is Goa State.

Key Points

• The State Reorganisation Act of 1956 was implemented to redraw the boundaries of Indian states based on linguistic lines.

• Goa was not formed through the State Reorganisation Act of 1956. It was annexed to India on 19th December 1961 through military action against Portuguese colonial rule.

• Goa became a Union Territory in 1961 and was later granted statehood on 30th May 1987.

• The State Reorganisation Act led to the formation or restructuring of several states, but Goa's inclusion into India was separate and unrelated to this legislative act.

• Goa was under Portuguese colonial rule for over 450 years before becoming a part of India.

Additional Information

• Rajasthan State

• Rajasthan was reorganized under the State Reorganisation Act of 1956.

• It was formed by merging Ajmer, Abu Road Taluka, Sunel-Tappa (from Madhya Pradesh), and other princely states.

• The state is known for its rich cultural heritage and historical significance, including forts, palaces, and desert landscapes.

• Mysore State

• Mysore State was reorganized under the State Reorganisation Act of 1956.

• It was later renamed as Karnataka in 1973.

• The linguistic reorganization included merging Kannada-speaking regions from other areas into Mysore State.

• Karnataka is known for its contributions to Indian culture, architecture, and technology.

• Bombay State

• Bombay State was reorganized in 1956 under the State Reorganisation Act.

• It included Marathi-speaking and Gujarati-speaking regions.

• Later, Bombay State was bifurcated into Maharashtra and Gujarat on 1st May 1960.

• The bifurcation was based on linguistic demographics—Marathi-speaking regions formed Maharashtra, while Gujarati-speaking regions formed Gujarat.

• The State Reorganisation Act of 1956

• This act was a major reform in independent India aimed at creating states based on linguistic identities.

• The States Reorganisation Commission (SRC), headed by Fazal Ali, recommended the changes.

• The act resulted in the formation of 14 states and 6 union territories.

• It addressed administrative and political challenges caused by linguistic diversity, paving the way for linguistic harmony.

Q10. Answer: (d) Article 43

The correct answer is Article 43.

Key Points

• Article 43 of the Directive Principles of State Policy in the Indian Constitution directs the State to promote cottage industries in rural areas on an individual or cooperative basis.

• The objective is to ensure equitable distribution of resources and provide opportunities for employment and economic development in rural areas.

• This article is part of Part IV of the Indian Constitution, which encompasses the Directive Principles of State Policy aimed at establishing a welfare state.

• Under Article 43, the State endeavors to promote economic and social welfare by fostering self-employment and small-scale industries, especially in rural sectors.

• The focus on cottage industries contributes to rural development, self-reliance, and reducing migration to urban areas in search of employment.

Additional Information

• Article 41

• This article directs the State to secure the right to work, education, and public assistance in cases of unemployment, old age, sickness, and disablement within its economic capacity and development limits.

• It emphasizes providing social security and welfare for vulnerable sections of the population.

• Article 36

• This article defines the term "State" for the purpose of Part IV (Directive Principles of State Policy).

• The term includes the Government and Parliament of India, the Government and Legislature of each State, and all local or other authorities within the territory of India or under its control.

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• Article 55

• It deals with the election of the President of India.

• It specifies the manner of voting and the proportional representation system by means of a single transferable vote.

• This article does not relate to the promotion of cottage industries or rural development.

Q11. Answer: (c) Mauritius

The correct answer is Mauritius.

Key Points

• Mauritius became the first African country to sign the International Solar Alliance (ISA) in April 2025, demonstrating its commitment to renewable energy and sustainable development.

• The International Solar Alliance (ISA) is an initiative launched by India and France during the COP21 climate conference in 2015 with the goal of promoting solar energy deployment globally.

• Mauritius has been actively working towards renewable energy solutions, with solar energy forming a significant part of its energy strategy.

• The signing of the ISA agreement by Mauritius signifies its alignment with global efforts to combat climate change and transition towards clean energy.

• As a member of the ISA, Mauritius will benefit from technical cooperation, capacity building, and financial assistance to expand its solar energy projects.

Additional Information

• Senegal:

• Senegal is a West African nation that has been investing in renewable energy, particularly solar and wind power, to reduce its dependence on fossil fuels.

• Although Senegal has joined the ISA, it was not the first African country to sign the agreement.

• The country's solar projects, such as the Bokhol Solar Park, are part of its efforts to achieve sustainable energy goals.

• Lesotho:

• Lesotho, a landlocked country in Southern Africa, heavily relies on hydroelectric power for its energy needs.

• It has shown interest in diversifying its energy mix but is not yet a major player in solar energy initiatives like the ISA.

• Lesotho's renewable energy focus includes small-scale solar projects aimed at rural electrification.

• Egypt:

• Egypt is one of the leading countries in Africa in renewable energy development, with significant investments in solar and wind power.

• The Benban Solar Park in Egypt is one of the largest solar installations in the world.

Q12. Answer: (b) Deccan Plateau

The correct answer is Deccan Plateau.

Key Points

• The Deccan Plateau is a triangular-shaped landmass that lies between the Western Ghats and the Eastern Ghats in southern India.

• It covers parts of Maharashtra, Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, and Kerala.

• The plateau is characterized by black soil derived from volcanic rocks and is highly fertile, especially for cotton cultivation.

• The Deccan Plateau is bounded by the Satpura and Vindhya ranges in the north and extends southward to the tip of the Indian peninsula.

• It is home to several rivers, including the Krishna, Godavari, and Kaveri, which originate from the Western Ghats and flow eastward towards the Bay of Bengal.

Additional Information

• Chhota Nagpur Plateau:

• Located in eastern India, this plateau is spread across Jharkhand, Odisha, Chhattisgarh, and West Bengal.

• It is rich in mineral resources, especially coal, iron ore, mica, and bauxite.

• The Damodar River flows through this region, making it a prominent industrial area for steel and power generation.

• Malwa Plateau:

• Situated in western India, covering parts of Madhya Pradesh and Rajasthan.

• It is bounded by the Aravalli Hills in the northwest and the Vindhya Range in the south.

• The plateau is known for black soil and is a major agricultural region for crops like wheat, soybean, and cotton.

• Meghalaya Plateau:

• Located in northeastern India, it includes the Khasi, Jaintia, and Garo Hills.

• The region is known for heavy rainfall and biodiversity, with Cherrapunji and Mawsynram being among the wettest places on Earth.

• It is composed of ancient Archean rocks and is rich in coal and limestone deposits.

Q13. Answer: (d) NITI Aayog

The correct answer is NITI Aayog.

Key Points

• NITI Aayog is the policy think tank of the Government of India, established to provide strategic and technical advice on key developmental issues, including economic growth and social development.

• The strategic report titled "Designing a Policy Framework for Medium Enterprises" was unveiled by NITI Aayog to highlight the importance of medium enterprises in India's economic development.

• The report focuses on creating a distinct policy framework for medium enterprises, which often get overshadowed by large corporations and small-scale industries in policymaking.

• The aim is to address challenges faced by medium enterprises, such as limited access to credit, inadequate infrastructure, and lack of innovation support, to enhance their contribution to the Indian economy.

• This initiative aligns with NITI Aayog's mandate of driving economic growth through evidence-based policy-making and fostering innovation and entrepreneurship.

Additional Information

• Reserve Bank of India (RBI)

• The Reserve Bank of India is the central bank of India responsible for monetary policy, regulation of financial institutions, and issuance of currency.

• It plays a crucial role in ensuring financial stability and promoting growth by regulating credit flow and inflation.

• RBI's focus is on areas like banking supervision, digital payments, and financial inclusion rather than direct policy design for medium enterprises.

• Ministry of MSME

• The Ministry of Micro, Small, and Medium Enterprises (MSME) is responsible for formulating policies, schemes, and programs for MSMEs.

• It ensures that small and medium enterprises receive adequate support in terms of credit, skill development, and market access.

• Though the ministry focuses on MSMEs, the strategic report mentioned in the question was specifically prepared by NITI Aayog.

• Confederation of Indian Industry (CII)

• CII is a non-government, not-for-profit, industry-led organization that works to create a favorable environment for industrial growth in India.

• It provides policy inputs and promotes competitiveness in industries but is not directly involved in unveiling strategic government reports.

• Main Theme: Medium Enterprises

• Medium enterprises are a critical component of India's economy, bridging the gap between small businesses and large corporations.

• They play a significant role in job creation, innovation, and exports, contributing to the country's GDP growth.

• However, medium enterprises often face specific challenges, such as limited access to funding, lack of scalability, and inadequate policy focus, which the NITI Aayog report aims to address.

Q14. Answer: (d) Article 246

The correct answer is Article 246.

Key Points

• Article 246 of the Indian Constitution deals with the distribution of legislative powers between the Union and the States.

• It provides for three lists in the Seventh Schedule: Union List, State List, and Concurrent List, which outline the subjects on which legislation can be enacted.

• The Union List includes subjects like defense, foreign affairs, atomic energy, etc., over which only the Parliament has exclusive legislative authority.

• The State List includes subjects like police, public health, agriculture, etc., where the state legislatures have exclusive powers.

• The Concurrent List includes subjects such as education, marriage, and bankruptcy, where both the Union and State legislatures can legislate.

• In case of conflict between Union and State laws on a Concurrent List subject, the Union law prevails, as per Article 254.

Additional Information

• Article 368:

• Article 368 of the Indian Constitution deals with the procedure for amending the Constitution.

• It provides for two types of amendments: Simple Majority Amendments and Special Majority Amendments.

• Special Majority Amendments require approval by two-thirds of the members present and voting, along with a majority of the total membership of Parliament.

• Some amendments also require ratification by half of the State Legislatures.

• Article 240:

• Article 240 empowers the President of India to make regulations for certain Union Territories.

• These Union Territories include Andaman and Nicobar Islands, Lakshadweep, Dadra and Nagar Haveli, and Daman and Diu.

• The President can legislate on matters concerning these territories, subject to the powers conferred by Parliament.

• Article 280:

• Article 280 of the Indian Constitution provides for the establishment of the Finance Commission.

• The Finance Commission is responsible for recommending the distribution of financial resources between the Union and the States.

• It determines the principles for sharing taxes, grants-in-aid to states, and financial relations between different levels of government.

Q15. Answer: (a) Anthocyanins

The correct answer is Anthocyanins.

Key Points

• Anthocyanins are water-soluble pigments found in plant tissues that are responsible for red, purple, and blue colors in flowers, fruits, and leaves.

• In acidic environments (low pH), anthocyanins impart a reddish-purple color, which is why petunias exhibit this coloration under such conditions.

• These pigments belong to a class of compounds called flavonoids, which are derived from phenylalanine and are known for their antioxidant properties.

• The color of anthocyanins is highly dependent on the pH level of their environment: they appear red in acidic conditions, purple at neutral pH, and blue in alkaline conditions.

• Anthocyanins play a critical role in attracting pollinators to flowers like petunias and also in protecting plant tissues from ultraviolet light damage.

Additional Information

• Carotenes

• Carotenes are orange, yellow, or red pigments that belong to the carotenoid family and are found in fruits and vegetables such as carrots, pumpkins, and tomatoes.

• Unlike anthocyanins, carotenes are fat-soluble pigments and are not pH-sensitive.

• They play an essential role in photosynthesis by capturing light energy and are also precursors to Vitamin A in humans.

• Betalains

• Betalains are water-soluble pigments found in plants of the Caryophyllales order, such as beets and bougainvillea.

• They are divided into two categories: betacyanins (red-violet) and betaxanthins (yellow-orange).

• Lycopene

• Lycopene is a red carotenoid pigment found in tomatoes, watermelons, and red peppers.

• It is known for its antioxidant properties and potential health benefits, such as reducing the risk of certain cancers and heart diseases.

Q16. Answer: (d) Ministry of Culture

The correct answer is Ministry of Culture.

Key Points

• The Kutiyattam Kendra, located in Thiruvananthapuram, Kerala, is an institution established for the preservation and promotion of Kutiyattam, the Sanskrit theatrical tradition of Kerala.

• It is under the purview of the Ministry of Culture, Government of India, which oversees and funds initiatives to promote India's intangible cultural heritage.

• Kutiyattam is recognized as a UNESCO Intangible Cultural Heritage of Humanity due to its historical and cultural significance as one of the oldest surviving forms of Sanskrit theatre.

• The Kutiyattam Kendra plays a vital role in training new artists, organizing performances, and conducting research to preserve this ancient art form.

• The Ministry of Culture supports various zonal cultural centers and institutions like Kutiyattam Kendra to safeguard and promote traditional art forms across India.

Additional Information

• Kerala Tourism Department

• The Kerala Tourism Department is responsible for promoting tourism in the state of Kerala.

• It focuses on showcasing Kerala's natural beauty, cultural heritage, and wellness tourism, such as Ayurveda.

• Though it supports cultural initiatives, it does not oversee Kutiyattam Kendra, as it falls under the Ministry of Culture.

• Ministry of Education

• The Ministry of Education is primarily concerned with policy formulation and implementation related to education in India.

• It oversees institutions such as schools, colleges, and universities, ensuring quality education and promoting literacy.

• It does not directly involve itself in the promotion of cultural or heritage art forms like Kutiyattam.

• UNESCO

• UNESCO (United Nations Educational, Scientific and Cultural Organization) works globally to preserve cultural and natural heritage.

• It recognized Kutiyattam as an Intangible Cultural Heritage of Humanity in 2001, bringing international attention to this ancient art form.

• However, UNESCO does not manage or oversee the functioning of Kutiyattam Kendra; it only provides recognition and advocacy.

Q17. Answer: (a) Ranabhandagarika

The correct answer is Ranabhandagarika.

Key Points

• The officer known as the Ranabhandagarika during the Gupta period was responsible for managing the stores and the supply of weapons like spears and swords.

• This position held significant importance in the Gupta administration as it ensured the proper maintenance of weaponry for military operations and defense.

• The term "Ranabhandagarika" is derived from "Rana" (war) and "Bhandagarika" (storekeeper), clearly indicating their role in managing war supplies.

• Efficient administration of weapon storage and supply played a crucial role in maintaining the Gupta Empire's military strength and ensuring readiness for wars or invasions.

• The Gupta Empire had a well-organized administrative system, and the Ranabhandagarika was a key official associated with the military department.

Additional Information

• Sandhivigrahika

• The Sandhivigrahika was an important officer in the Gupta administration, often referred to as the minister of peace and war.

• This officer was responsible for matters related to negotiations, treaties, and war strategies, acting as an intermediary in diplomatic discussions.

• The Sandhivigrahika played a vital role in maintaining foreign relations and ensuring the security of the Gupta Empire through strategic alliances.

• Kumaramatya

• Kumaramatyas were high-ranking officials in the Gupta administration who were typically appointed by the king to oversee various administrative and judicial functions.

• They were often members of the royal family or trusted nobles and held significant responsibilities in the governance of provinces and districts.

• The Kumaramatyas contributed to the efficient functioning of the central and provincial administration during the Gupta period.

• Mahadandanayaka

• The Mahadandanayaka was the chief judicial officer in the Gupta administration, equivalent to the modern-day chief justice.

• This officer was responsible for maintaining law and order, resolving disputes, and ensuring the implementation of judicial decisions.

• The Mahadandanayaka played a crucial role in upholding justice and the legal framework of the Gupta Empire.

• Gupta Administration

• The Gupta Empire (circa 320–550 CE) is known for its efficient administrative system, which was divided into central, provincial, district, and village levels.

• The empire had a well-organized military system, with specialized officials like the Ranabhandagarika for managing war supplies.

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• The Gupta period is often referred to as the "Golden Age of India" due to its advancements in administration, culture, economy, and scientific achievements.

Q18. Answer: (c) Kota and Puri

The correct answer is Kota and Puri.

Key Points

• Kota, Rajasthan: This airport is a major step for the city known as an educational and industrial hub, serving the wider Hadoti region and supporting local growth.

• Puri, Odisha: The airport aims to provide better direct connectivity for the famous pilgrimage site, enhancing access for millions of devotees and tourists.

• Significance: The approvals fall under the UDAN scheme (Ude Desh Ka Aam Naagrik) and focus on making air travel accessible, stimulating economic activity, and integrating these areas into India's aviation network.

Additional Information

• Greenfield Airports

• Greenfield airports are developed in locations where no prior airport infrastructure exists.

• These projects aim to address the growing demand for air travel and improve regional connectivity.

• India has been focusing on constructing Greenfield airports under schemes like UDAN to enhance accessibility to remote areas and boost economic development.

Q19. Answer: (a) Neeraj Ghaywan

The correct answer is Neeraj Ghaywan.

Key Points

• Neeraj Ghaywan is a critically acclaimed Indian filmmaker known for his unique storytelling and socially relevant themes.

• He gained prominence with his award-winning debut feature film Masaan (2015), which won two awards at the Cannes Film Festival in the Un Certain Regard section.

• The Indian entry at the 78th Cannes Film Festival, 'Homebound', starring Janhvi Kapoor, Ishaan Khatter, and Vishal Jethwa, was directed by Neeraj Ghaywan.

• Neeraj's filmmaking style is often noted for its nuanced portrayal of emotions and societal issues, making his work resonate with both critics and audiences globally.

• He has also contributed to popular OTT platforms, directing episodes in critically acclaimed series like "Sacred Games" and "Made in Heaven."

Additional Information

• Karan Johar

• A prominent Bollywood filmmaker, producer, and screenwriter known for directing and producing popular films under his production house Dharma Productions.

• Some of his iconic works include Kuch Kuch Hota Hai, Kabhi Khushi Kabhie Gham, and My Name is Khan.

• He is also a notable television host and mentor to many young actors in the Indian film industry.

• Anurag Kashyap

• A renowned filmmaker and screenwriter, known for his edgy and unconventional storytelling style.

• His notable works include Gangs of Wasseypur, Black Friday, and Dev.D.

• He has been a strong proponent of independent cinema in India and has also directed segments of anthology films like Lust Stories and Ghost Stories.

• Anurag Basu

• A celebrated filmmaker known for his unique narrative style and visually appealing films.

• Some of his notable works include Barfi!, Life in a... Metro, and Ludo.

• He is known for his ability to blend emotions, drama, and humor effectively in his films.

• About the Cannes Film Festival:

• The Cannes Film Festival is one of the most prestigious international film festivals held annually in Cannes, France.

• It showcases films from across the globe, celebrating excellence in filmmaking, storytelling, and artistic expression.

• The festival awards include the Palme d'Or, Grand Prix, and Best Director, among others.

Q20. Answer: (b) Because of steep slopes and thin soil layers

The correct answer is Because of steep slopes and thin soil layers.

Key Points

• Hilly states like Himachal Pradesh and Uttarakhand experience steep slopes that make it difficult to carry out large-scale

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agricultural activities.

• The soil in hilly regions is often thin, rocky, and less fertile, which limits the scope of cultivation.

• Terrace farming is practiced in some areas, but the total area available for cultivation remains limited due to the topography.

• Unfavorable climatic conditions, such as heavy rainfall leading to soil erosion, also impact the availability of arable land.

• The forest cover in these regions is extensive, which further reduces the land available for agriculture but is crucial for maintaining ecological balance.

Additional Information

• Due to urban expansion

• Urban expansion refers to the growth of cities and towns into rural areas. While this may reduce agricultural land in urbanized states, it is not a significant factor in hilly regions like Himachal Pradesh and Uttarakhand, where urbanization is limited.

• These states primarily have rural populations, and the impact of urban expansion on net sown area is negligible compared to geographical and climatic constraints.

• Because of poor soil fertility

• Although soil fertility might be a concern in certain areas, it is not the primary reason for low net sown area in hilly states.

• The primary issue is the steep topography and thin soil layers that prevent large-scale agricultural practices, even in areas where the soil may be fertile.

• Due to frequent floods

• Floods are more common in plains and low-lying areas than in hilly regions like Himachal Pradesh and Uttarakhand.

• While these states experience landslides and heavy rainfall, floods are not a major factor affecting the net sown area.

Important Points

• Net Sown Area

• Net sown area refers to the total area sown with crops in a given agricultural year.

• It is a key indicator of agricultural productivity and land usage in a region.

• Factors affecting the net sown area include topography, soil quality, climate, irrigation facilities, and population density.

Q21. Answer: (c) Goal 7

The correct answer is Goal 7.

Key Points

• Goal 7 of the Sustainable Development Goals (SDGs) focuses on ensuring access to affordable, reliable, sustainable, and modern energy for all.

• This goal aims to achieve universal access to affordable electricity, increase the share of renewable energy, and improve energy efficiency globally.

• It specifically targets increasing the use of renewable energy such as solar, wind, and hydropower to reduce reliance on non-renewable and polluting energy sources like coal and oil.

• Goal 7 emphasizes enhancing international cooperation to facilitate access to clean energy research, technology, and investment in energy infrastructure.

• By ensuring sustainable energy access, the SDG aims to address critical issues such as poverty alleviation, climate change mitigation, and sustainable development.

Additional Information

• Goal 12 (Responsible Consumption and Production):

• Goal 12 focuses on ensuring sustainable consumption and production patterns to reduce the environmental impact of economic activities.

• It includes targets such as reducing food waste, improving resource efficiency, and promoting sustainable practices by businesses.

• The goal also emphasizes reducing waste generation through recycling and reuse to promote a circular economy.

• Goal 5 (Gender Equality):

• Goal 5 aims to achieve gender equality and empower all women and girls globally.

• Its targets include eliminating gender-based violence, discrimination, and harmful practices such as child marriage and female genital mutilation.

• It also focuses on ensuring women's equal participation in leadership, access to education, and economic opportunities.

• Goal 10 (Reduced Inequalities):

• Goal 10 focuses on reducing inequalities within and among countries.

• It includes addressing income inequality, promoting social, economic, and political inclusion, and facilitating safe migration.

• The goal also seeks to improve financial markets and institutions to provide equal opportunities for all.

Q22. Answer: (d) Madhya Pradesh

The correct answer is Madhya Pradesh.

Key Points

• In April 2025, Madhya Pradesh became the first state to implement an AI-based real-time forest monitoring system in its sensitive forest divisions.

• This system leverages cutting-edge artificial intelligence technology to monitor forest cover and prevent illegal activities such as deforestation and poaching.

• The initiative enhances the state's ability to track changes in forest density, detect forest fires, and respond to environmental threats in real-time.

• The project focuses on sensitive forest divisions, including protected areas and wildlife sanctuaries, ensuring the preservation of biodiversity.

• This innovative step aligns with India's commitments to combat climate change and achieve sustainable development goals through enhanced forest conservation.

Additional Information

• Assam

• Assam is known for its rich biodiversity and unique forest ecosystems, including Kaziranga National Park and Manas Wildlife Sanctuary.

• While it has implemented forest conservation measures, it has not been the first state to adopt AI-based real-time forest monitoring.

• Assam is also addressing challenges like human-wildlife conflict and illegal logging through traditional and digital monitoring methods.

• Odisha

• Odisha is home to extensive forest areas and wildlife reserves, including Similipal National Park and Bhitarkanika National Park.

• The state employs technologies such as GIS and remote sensing for forest management but has not pioneered AI-based real-time monitoring systems.

• Odisha is also recognized for its efforts in mangrove restoration and climate resilience projects.

• Gujarat

• Gujarat has significant forest cover, including the Gir National Park, which is the last refuge of the Asiatic lion.

• The state utilizes advanced surveillance systems for wildlife protection but has not yet implemented AI-based real-time forest monitoring across its divisions.

• Efforts in Gujarat are focused on wildlife conservation and habitat restoration.

Q23. Answer: (d) RAM

The correct answer is RAM.

Key Points

• RAM (Random Access Memory) is a type of primary memory that is directly accessible by the CPU.

• It temporarily stores data and instructions that the computer is currently using, ensuring faster read/write speeds compared to secondary storage.

• RAM is a volatile memory, meaning it loses its contents when the power supply is turned off.

• It plays a crucial role in determining the performance of a computer, as it impacts the system's ability to handle multiple tasks efficiently.

• Modern computers use DDR (Double Data Rate) RAM, such as DDR4 or DDR5, which provides higher performance and efficiency compared to older types like DDR3.

Additional Information

• Hard Disk

• A hard disk is a type of secondary storage device used to store data permanently.

• Unlike RAM, the data stored on a hard disk is non-volatile and remains intact even when the computer is powered off.

• It is slower than RAM in terms of data access speed but can store significantly larger amounts of data.

• Modern hard disks are being replaced or supplemented by faster storage devices like SSDs (Solid State Drives).

• CD-ROM

• CD-ROM (Compact Disc-Read Only Memory) is an optical storage medium used for reading data that has been written onto it.

• It is primarily used for distributing software, music, and other data.

• As a read-only memory, data on a CD-ROM cannot be modified once written.

• Its storage capacity typically ranges from 650 MB to 700 MB.

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• Floppy Disk

• A floppy disk is an outdated magnetic storage medium used for storing small amounts of data.

• It was widely used in the 1980s and 1990s but has now been replaced by more modern storage devices such as USB drives and cloud storage.

• Floppy disks typically had a storage capacity of 1.44 MB.

• Due to their limited storage and slow access speed, floppy disks are now obsolete.

Q24. Answer: (b) Zinc

The correct answer is Zinc.

Key Points

• Zinc plays a crucial role in the synthesis, storage, and secretion of insulin, which is vital for maintaining blood sugar levels.

• It assists in the digestion and metabolism of carbohydrates, proteins, and fats by acting as a cofactor for over 300 enzymes in the body.

• Zinc contributes to the functioning of the male prostate gland by supporting hormone production and maintaining prostate health.

• It also aids in tissue growth, repair, and overall immune system support, which are critical for maintaining good health.

• Zinc deficiencies can lead to impaired insulin production, poor wound healing, and issues related to the male reproductive system.

Additional Information

• Iron:

• Iron is a critical component of hemoglobin, responsible for transporting oxygen in the blood.

• It plays a role in energy production and supports immune function.

• A deficiency in iron can lead to anemia, characterized by fatigue, weakness, and shortness of breath.

• However, iron does not play a direct role in insulin synthesis or prostate function.

• Phosphorus:

• Phosphorus is primarily involved in the formation of bones and teeth and plays a role in energy production in the form of ATP (adenosine triphosphate).

• It aids in the regulation of acid-base balance in the body.

• Though essential for overall metabolism, phosphorus does not have a direct impact on insulin or prostate function.

• Nickel:

• Nickel is a trace element that is required in small amounts for various enzymatic processes.

• It plays a role in urea production and metabolism of fatty acids and hormones.

• Its role in insulin synthesis or prostate health is not as significant as zinc's.

Q25. Answer: (b) 2007

The correct answer is 2007.

Key Points

• Red Bull India Private Limited (RBIL) began importing and selling Red Bull Energy Drink and its variants in India in the year 2007.

• Red Bull is a globally recognized energy drink brand that was founded by Austrian entrepreneur Dietrich Mateschitz in 1987.

• Red Bull's entry into the Indian market in 2007 marked a significant milestone in the energy drink segment in India.

• RBIL has since expanded its reach across India, becoming a leading player in the energy drink market, targeting athletes, students, and working professionals.

• The company has been involved in various marketing strategies, including sports sponsorships, to increase its brand presence in the Indian market.

Additional Information

• Energy Drinks Market in India

• The Indian energy drinks market has witnessed exponential growth since Red Bull's entry in 2007, driven by increasing urbanization and changing consumer lifestyles.

• Popular competitors in the energy drink sector in India include Monster Energy, Cloud 9, and Sting.

• The market is expected to continue growing, with innovations in product flavors and health-focused formulations.

Q26. Answer: (a) Aditya-L1

The correct answer is Aditya-L1.

Key Points

• Aditya-L1 is India's first dedicated solar mission, developed by the Indian Space Research Organisation (ISRO).

• In February 2025, Aditya-L1 captured its first image of a solar flare, marking a significant milestone in India's space exploration program.

• The mission was launched to study the Sun, focusing on its corona, chromosphere, and the solar winds.

• Aditya-L1 is equipped with seven payloads that provide a comprehensive understanding of the Sun's behavior and its impact on space weather.

• The spacecraft was positioned at the Lagrange Point 1 (L1), about 1.5 million kilometers from Earth, to provide an uninterrupted view of the Sun.

Additional Information

• AstroSat

• AstroSat is India's first dedicated multi-wavelength space observatory, launched by ISRO in 2015.

• Its primary purpose is to study celestial objects in ultraviolet, optical, and X-ray wavelengths simultaneously.

• AstroSat has provided significant insights into the Universe, such as the detection of extreme ultraviolet light from galaxies.

• It is not designed to study the Sun or solar flares, as its focus is on deep space objects like stars, galaxies, and black holes.

• Mangalyaan-2

• Mangalyaan-2, also known as Mars Orbiter Mission 2 (MOM-2), is India's second planned mission to Mars.

• It is expected to carry advanced instruments for studying Mars' atmosphere, surface, and mineral composition.

• The mission has no connection to studying the Sun or capturing images of solar flares.

• Chandrayaan-3

• Chandrayaan-3 is India's third lunar exploration mission, launched by ISRO in 2023.

• The mission successfully achieved a soft landing on the Moon, focusing on studying the lunar surface and its composition.

• Its objectives are unrelated to solar observations or capturing images of solar flares.

Q27. Answer: (a) Agricultural sector

The correct answer is Agricultural sector.

Key Points

• In 1947, the Indian economy was predominantly agrarian, with more than 70% of the population engaged in agricultural activities.

• The agricultural sector contributed the largest share to the Indian GDP at the time of independence, highlighting its dominance in the economy.

• Despite its significance, agriculture was underdeveloped, marked by low productivity, outdated techniques, and dependence on monsoons.

• The sector faced challenges due to colonial policies, which prioritized cash crops for export rather than food crops for domestic consumption.

• Additionally, land ownership was skewed, with the zamindari system creating inequities among farmers.

Additional Information

• Industrial Sector:

• The industrial sector was relatively small in 1947, contributing only a minor share to India's GDP.

• Most industries were concentrated in urban areas and focused on textiles, jute, and basic consumer goods.

• India lacked heavy industries, as the colonial government discouraged industrialization to maintain dependence on British imports.

• Post-independence efforts focused on expanding this sector, particularly through the establishment of public sector enterprises.

• Services Sector:

• The services sector, which includes trade, transportation, and administration, was not a significant contributor to the economy at the time of independence.

• Its contribution to GDP was minimal compared to agriculture and industry.

• The growth in this sector accelerated in later decades, driven by advancements in IT, telecommunications, and financial services.

• Manufacturing Sector:

• The manufacturing sector was underdeveloped during colonial rule, and its contribution to the economy was limited.

• Small-scale industries dominated manufacturing, with little technological innovation.

• Post-independence, the Indian government focused on building a robust manufacturing base, particularly through the establishment of heavy industries and industrial policies.

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Q28. Answer: (d) 1991

The correct answer is 1991.

Key Points

• India officially started economic liberalisation in 1991 under the leadership of then Prime Minister P.V. Narasimha Rao and Finance Minister Dr. Manmohan Singh.

• The liberalisation measures were introduced to tackle the balance of payments crisis that India faced during the early 1990s.

• The reforms consisted of structural changes such as reducing trade barriers, deregulating industries, and encouraging foreign investment to spur economic growth.

• The New Economic Policy (NEP) of 1991 focused on LPG: Liberalisation, Privatisation, and Globalisation.

• Key sectors such as banking, telecommunications, and insurance experienced deregulation, and India opened its markets to global trade, marking a shift from a closed economy to a more market-oriented economy.

Additional Information

• Option 1: 1995

• India joined the World Trade Organization (WTO) in 1995, which further integrated the Indian economy into global trade networks.

• The establishment of the WTO marked India's commitment to multilateral trade agreements and globalisation.

• Option 2: 2000

• During this period, India witnessed the dot-com boom and increased focus on the Information Technology (IT) sector, with IT industries becoming major contributors to economic growth.

• The Electricity Act of 2003, formulated shortly after this period, marked reforms in India's power sector.

• Option 3: 1985

• It marked preliminary steps towards reform under Prime Minister Rajiv Gandhi.

• During this time, there was an emphasis on promoting technology and modernisation, but comprehensive liberalisation measures were not introduced.

Q29. Answer: (c) Kabul River

The correct answer is Kabul River.

Key Points

• The Kabul River is a right-bank tributary of the Indus River, originating in the Hindu Kush Mountains near Maidan Wardak Province in Afghanistan.

• It flows through eastern Afghanistan and northern Pakistan before joining the Indus River near the city of Attock in Pakistan.

• The river has several tributaries, including the Kunar River, which contributes significantly to its flow.

• The Kabul River is an important water source for irrigation and hydroelectric power generation in the region.

• It plays a significant role in the socio-economic development of the areas it traverses, especially in Afghanistan and Pakistan.

Additional Information

• Jhelum River:

• The Jhelum River is a left-bank tributary of the Indus River and originates from Verinag Spring in Jammu & Kashmir, India.

• It flows through the Kashmir Valley and is an important source of water for agriculture and hydropower in the region.

• Major dams on the Jhelum include the Mangla Dam in Pakistan.

• Ravi River:

• The Ravi River is another left-bank tributary of the Indus and originates in Himachal Pradesh, India.

• It flows through Punjab (India) and Punjab (Pakistan) before merging with the Chenab River.

• The Ravi is one of the five rivers of the Punjab region and is significant for irrigation in both India and Pakistan.

• Chenab River:

• The Chenab River is a left-bank tributary of the Indus River, formed by the confluence of the Chandra and Bhaga rivers in Himachal Pradesh, India.

• It flows through Jammu & Kashmir and Punjab (Pakistan) before joining the Indus River.

• The river is crucial for agriculture and hydropower in the region, with several dams and barrages constructed on it.

Q30. Answer: (c) It provides energy

The correct answer is It provides energy.

Key Points

• Carbohydrates are the primary source of energy for the human body, especially for the brain, muscles, and other vital organs.

• They are broken down into glucose during digestion, which is then utilized by cells for energy production through cellular

respiration.

• Each gram of carbohydrate provides 4 kilocalories of energy, making it a highly efficient energy source.

• Carbohydrates are stored in the body in the form of glycogen in the liver and muscles, which acts as a reserve energy supply during physical activity or fasting.

• Foods rich in carbohydrates include rice, bread, pasta, fruits, vegetables, and legumes.

Additional Information

• Option 1: It is crucial for growth

• While carbohydrates play an indirect role in growth by providing energy for cell metabolism, growth primarily depends on proteins, vitamins, and minerals.

• Proteins are essential for the synthesis of enzymes, hormones, and structural components, which are necessary for growth and repair.

• Option 2: It regulates hormones

• Carbohydrates do not directly regulate hormones; however, they can influence insulin secretion, which is a hormone that regulates blood sugar levels.

• Hormonal regulation is primarily carried out by glands in the endocrine system, including hormones like growth hormone, thyroid hormones, and sex hormones.

• Option 4: It insulates the body

• Insulation of the body is primarily a function of lipids (fats). Fats form a layer beneath the skin, helping to maintain body temperature by reducing heat loss.

• Adipose tissue, which stores fat, plays a crucial role in insulation and energy storage.

Q31. Answer: (a) 6,00,000–1,50,000 years BP

The correct answer is 6,00,000–1,50,000 years BP.

Key Points

• The Lower Palaeolithic period in India spans approximately 6,00,000 to 1,50,000 years BP (Before Present), coinciding with the early Stone Age.

• This period is characterized by the use of stone tools, particularly Acheulian hand-axes and cleavers, made from quartzite and other available materials.

• The Acheulian phase, named after discoveries in Saint-Acheul, France, is known for its advanced bifacial tools used for hunting and other purposes.

• Prominent Lower Palaeolithic sites in India include Attirampakkam in Tamil Nadu, Bhimbetka in Madhya Pradesh, and Hunsgi in Karnataka.

• These tools and archaeological evidence suggest that early humans of this time were hunter-gatherers, relying heavily on their tools for survival.

Additional Information

• 1,65,000–31,000 years BP:

• This timeline corresponds to the Middle Palaeolithic period in India.

• It is marked by the use of flake tools, which were smaller and more refined compared to Acheulian tools.

• Technological advancements included the use of Levallois technique for tool-making.

• Sites such as Nevasa in Maharashtra and Paisra in Bihar represent this era.

• 1,00,000–10,000 years BP:

• This period corresponds to the Upper Palaeolithic period, characterized by advanced blade and burin tools.

• Early evidence of artistic expression, such as cave paintings and engravings, is seen during this phase.

• Key sites include Bhimbetka rock shelters, where prehistoric art depicts the life of early humans.

• 40,000–12,000 years:

• This timeline overlaps with the later part of the Upper Palaeolithic period and the transition to the Mesolithic period.

• Microlithic tools, made from small stone flakes, became predominant during this era.

• Humans began to experiment with early forms of agriculture and domestication of animals.

Q32. Answer: (b) National and State Legal Services Authorities

The correct answer is National and State Legal Services Authorities.

Key Points

• Lok Adalats in India are organized by National Legal Services Authority (NALSA) and State Legal Services Authorities (SLSAs) under the Legal Services Authorities Act, 1987.

• The primary aim of Lok Adalats is to ensure speedy justice, reduce the burden on regular courts, and promote amicable dispute resolution.

• Cases resolved in Lok Adalats are legally binding, and settlements are treated as decrees of a civil court.

• They handle cases such as civil disputes, family disputes, labor disputes, public utility services, and petty criminal cases.

• Lok Adalats emphasize compromise and mutual agreement between disputing parties, ensuring cost-effective and accessible justice.

Additional Information

• Bar Council of India

• It is a statutory body established under the Advocates Act, 1961, responsible for regulating the legal profession and legal education in India.

• The Bar Council does not organize Lok Adalats but oversees the ethics, conduct, and qualifications of lawyers in India.

• It also prescribes standards for legal education and recognizes law universities.

• Law Commission of India

• It is an advisory body constituted by the Government of India to suggest legal reforms and recommend changes to existing laws.

• The Commission conducts studies and research to improve the justice delivery system but does not directly organize Lok Adalats.

• Its recommendations are not binding but have significantly influenced law-making in India.

• Advocate General of State

• The Advocate General is the highest law officer of the state government, appointed under Article 165 of the Indian Constitution.

• The role of the Advocate General is to provide legal advice to the state government and represent it in court cases.

• While the Advocate General is involved in legal matters, they are not responsible for organizing Lok Adalats.

• Lok Adalats

• Lok Adalats are a part of the Indian judicial system and are alternative dispute resolution forums aimed at reducing the burden on the formal courts.

• The decisions made in Lok Adalats are final and cannot be appealed in any court, ensuring timely resolution of disputes.

• These forums are especially beneficial for resolving cases where the parties are willing to settle the matter mutually.

Q33. Answer: (c) James

The correct answer is James.

Key Points

• Percival Everett won the 2025 Pulitzer Prize for Fiction for his novel James.

• James is a re-imagining of Mark Twain's The Adventures of Huckleberry Finn, told from the perspective of Jim, the enslaved character, giving him agency and a new narrative focus.

• The novel also won major literary awards including the National Book Award and the Kirkus Prize before the Pulitzer.

Additional Information

• Erasure

• Novel by Percival Everett that was adapted into the Oscar-winning film American Fiction (2023).

• The Trees

• Everett's novel that was shortlisted for the Booker Prize (2021) and Pulitzer finalist in 2022.

• Themes include history, race, and violence in the American South.

Q34. Answer: (a) Indian Institute of Technology, Madras

The correct answer is Indian Institute of Technology, Madras.

Key Points

• The 'Shri S. Ramakrishnan Centre of Excellence in Fluid and Thermal Science Research' was launched at Indian Institute of Technology (IIT), Madras in March 2025.

• This center aims to foster advanced research in fluid dynamics and thermal sciences with state-of-the-art infrastructure and funding.

• The center was named after Shri S. Ramakrishnan, a distinguished alumnus of IIT Madras, for his contributions to the field of science and engineering.

• The objective is to contribute to the development of cutting-edge technologies in areas such as aerospace, energy systems, and thermal management.

• It will also collaborate with industries and government organizations to address real-world challenges through innovative research.

Additional Information

• Indian Institute of Technology, Kanpur (IIT Kanpur)

• IIT Kanpur is renowned for its advancements in engineering and technology education.

• It is known for hosting centers like the National Wind Tunnel Facility and the Advanced Center for Materials Science.

• The institute has contributed significantly to research in areas such as artificial intelligence, cybersecurity, and robotics.

• Indian Institute of Technology, Bombay (IIT Bombay)

• IIT Bombay is a leading institute in India known for its strong focus on research and innovation.

• It has been instrumental in projects like the National Centre for Photovoltaic Research and Education (NCPRE).

• The institute has a robust startup ecosystem, fostering entrepreneurship and innovation in multiple domains.

• Indian Institute of Technology, Delhi (IIT Delhi)

• IIT Delhi is recognized for its contributions to scientific research and technological development.

• It hosts several centers of excellence, such as the Centre of Excellence for Biopharmaceutical Technology and the Bharti School of Telecommunication Technology and Management.

• The institute is actively involved in research on clean energy, healthcare technologies, and smart systems.

• Fluid and Thermal Sciences

• This interdisciplinary field focuses on studying the behavior and characteristics of fluids (liquids and gases) and heat transfer mechanisms.

• Applications include aerospace, automotive, renewable energy, and industrial process design.

• Advanced research in this area aims to improve energy efficiency, environmental sustainability, and the performance of thermal systems.

Q35. Answer: (c) Goa

The correct answer is Goa.

Key Points

• Konkani is the official language of Goa and is widely spoken by the majority of the state's population.

• It is recognized as one of the 22 scheduled languages of India under the Eighth Schedule of the Indian Constitution.

• The Konkani language has deep cultural and historical significance in Goa, with its roots traced back to early Indo-Aryan languages.

• Konkani is written in multiple scripts, including Devanagari (official script), Roman, Kannada, and Malayalam, depending on the region.

• The Goa, Daman, and Diu Official Language Act, 1987, declared Konkani as the official language of the state of Goa.

Additional Information

• Assam

• Assamese is the most widely spoken language in Assam and is the state's official language.

• The Assamese language is an Indo-Aryan language and holds historical and cultural importance in the northeastern region of India.

• Other languages spoken in Assam include Bodo (an official language in the Bodoland region), Bengali, and several tribal languages.

• Tripura

• Bengali is the most widely spoken language in Tripura and serves as the official language of the state.

• Kokborok, a Tibeto-Burman language, is another prominent language spoken by the indigenous tribal communities in Tripura.

• Tripura is linguistically diverse, with smaller tribal languages also being spoken in the region.

• Arunachal Pradesh

• Arunachal Pradesh is known for its linguistic diversity, with over 50 distinct languages spoken by various tribes.

• English is the official language of Arunachal Pradesh.

• Prominent tribal languages include Nyishi, Apatani, Monpa, Adi, and Mishmi, among others.

Q36. Answer: (c) Human supervision involved

The correct answer is Human supervision involved.

Key Points

• Planted vegetation refers to crops, plants, or trees grown under human supervision, whereas natural vegetation grows in the wild without any human intervention.

• Human supervision in planted vegetation includes activities like sowing seeds, watering plants, providing fertilizers, and controlling pests to ensure their growth and yield.

• Natural vegetation develops based on environmental factors such as climate, soil type, and availability of water, without external assistance.

• Planted vegetation is often grown for specific purposes such as agriculture, horticulture, or landscaping, while natural vegetation plays a critical role in maintaining ecological balance.

• The presence of human supervision in planted vegetation ensures controlled growth and planned outcomes, differentiating it from the spontaneous growth patterns seen in natural vegetation.

Additional Information

• Presence of fruits:

• Fruits are found in both planted and natural vegetation depending on the type of plant species.

• The presence of fruits is not a distinguishing factor between planted and natural vegetation.

• Planted vegetation might have a higher yield of fruits due to human efforts, but natural vegetation can also produce fruits naturally.

• Place of origin:

• The place of origin refers to where vegetation naturally or artificially grows.

• Natural vegetation originates in its native habitat, while planted vegetation can be grown in artificial or controlled environments.

• However, place of origin is not the key distinguishing factor between the two types of vegetation.

• Number of leaves:

• The number of leaves is dependent on the type of plant species and its growth pattern.

• It is not a relevant parameter to distinguish between planted and natural vegetation.

• Both planted and natural vegetation can have varying numbers of leaves based on environmental and genetic factors.

Q37. Answer: (c) Justice BR Gavai

The correct answer is Justice BR Gavai.

Key Points

• Justice Bhushan Ramkrishna Gavai was sworn in as the 52nd Chief Justice of India on 14 May 2025.

• He succeeded Justice Sanjiv Khanna and will serve until 23 November 2025.

• Gavai is the first Buddhist and the second Dalit judge to hold the CJI post.

Additional Information

• Justice NV Ramana

• Served as the 48th Chief Justice of India, taking oath in 2021.

• Known for efforts to modernize court procedures and reduce backlog.

• Justice DY Chandrachud

• Served as the 50th Chief Justice of India from November 2022 to November 2024.

• He played a key role in several landmark constitutional rulings.

• Justice Sanjiv Khanna

• Was the 51st Chief Justice of India from 11 November 2024 to 13 May 2025.

• Preceded Justice BR Gavai in the CJI succession list.

Q38. Answer: (a) Total area cultivated with crops during the year

The correct answer is Total area cultivated with crops during the year.

Key Points

• The term 'net sown area' refers to the total area of land on which crops are cultivated during a year.

• It includes land used for the cultivation of all types of crops, whether for food production, commercial purposes, or other agricultural uses.

• This measure does not account for multiple cropping (when more than one crop is grown on the same piece of land during a year).

• Net sown area is a critical agricultural statistic, as it helps determine the extent of land actively used for farming in a given year.

• It is a key indicator in understanding agricultural activity, land use patterns, and food production capacity in any region.

Additional Information

• Total area under irrigation

• This refers to the total area of land that is supplied with water through artificial means like canals, wells, and tube wells for agricultural purposes.

• It is different from net sown area as irrigation specifically focuses on the availability of water resources rather than the actual cultivation of crops.

• Irrigation is critical for ensuring water availability to crops, especially in regions with inadequate or erratic rainfall.

• Land covered with forests

• This refers to the area of land classified as forest by the government, primarily intended for conservation of biodiversity and as a habitat for wildlife.

• Forest areas are not counted under agricultural land or net sown area as they are not used for crop cultivation.

• Forests play a vital role in maintaining ecological balance and mitigating climate change.

• Land left uncultivated for more than five years

• This refers to land that has not been used for agricultural purposes for an extended period, typically more than five years.

• Such land is classified as fallow land or wasteland and is not included in the net sown area.

• Land may be left uncultivated due to poor soil fertility, water scarcity, or lack of resources for farming.

Q39. Answer: (d) Integrate the Indian economy with the world

The correct answer is Integrate the Indian economy with the world.

Key Points

• Globalisation refers to the integration of economies, cultures, and societies across countries through trade, technology, investment, and communication.

• The primary aim of globalisation is to connect the Indian economy with the global economy, fostering international cooperation and growth.

• It encourages free flow of goods, services, capital, and technology between nations, promoting mutual benefits.

• Globalisation enhances economic growth, employment opportunities, and technological advancement by exposing domestic industries to international competition and innovation.

• It also helps in attracting foreign direct investment (FDI), expanding market access, and increasing global trade partnerships.

Additional Information

• Option 1: Limit foreign trade

• Globalisation promotes foreign trade rather than limiting it.

• It eliminates trade barriers like tariffs and import restrictions, enabling countries to exchange goods and services freely.

• Limiting foreign trade contradicts the essence of globalisation, which aims to expand trade relations worldwide.

• Option 2: Reduce employment

• Globalisation often leads to the creation of employment opportunities, especially in sectors like manufacturing, IT, and services, as businesses expand globally.

• However, it can sometimes lead to job losses in industries unable to compete internationally, but overall, it is aimed at enhancing economic growth and employment.

• Option 3: Increase local production

• Globalisation does not primarily focus on increasing local production; instead, it focuses on integrating global markets.

• While it can boost local industries by exposing them to international markets, the concept goes beyond just local production to foster global interconnectedness.

Q40. Answer: (a) violent attacks on officials

The correct answer is violent attacks on officials.

Key Points

• The Non-Cooperation Movement was launched by Mahatma Gandhi in 1920 as a peaceful resistance against British rule in India.

• Violent attacks on officials were explicitly discouraged during the movement, as it was rooted in the principle of non-violence (Ahimsa).

• Gandhi believed in achieving independence through peaceful and non-violent means, making violent acts incompatible with the movement's ideology.

• Any instance of violence during the movement led Gandhi to call off the Non-Cooperation Movement, as seen in the Chauri Chaura incident in 1922.

• The movement aimed to create mass non-violent resistance, including boycotts, strikes, and refusal to cooperate with British authorities.

Additional Information

• Refusal to pay taxes:

• As part of the Non-Cooperation Movement, Indians were encouraged to refuse payment of taxes to the British government.

• This was a significant form of protest aimed at weakening the financial hold of the British administration over India.

• It symbolized the rejection of British authority and was a peaceful method of non-cooperation.
• Boycott of British courts:
• Gandhi urged lawyers and common citizens to boycott British courts and settle disputes through Indian arbitration systems.
• This was intended to delegitimize British legal institutions and promote self-reliance among Indians.
• The boycott of courts symbolized the refusal to accept British authority and reliance on indigenous systems.
• Closure of schools and colleges:
• Indian students were encouraged to leave government-run schools and colleges and join nationalist institutions such as Jamia Millia Islamia and Kashi Vidyapeeth.
• This was aimed at rejecting British education and promoting Indian values and culture.
• The closure of schools and colleges was a peaceful measure to oppose British rule and create self-sufficient educational systems.
• Non-Cooperation Movement Theme:
• The movement included boycotts of British goods, titles, and institutions, promoting indigenous alternatives (Swadeshi).
• It was rooted in non-violence and aimed to unite Indians across regional, religious, and caste lines against British rule.
• The movement marked a significant step toward India's independence struggle, emphasizing mass mobilization and peaceful resistance.

Q41. Answer: (d) 79°

Shortcut Trick

In the right-angled triangle BDC, we have angle C = 90° − angle DBC = 90° − 60° = 30°.

By the Exterior Angle Theorem in triangle AEC, the exterior angle angle AEB is equal to the sum of the two opposite interior angles:

angle AEB = angle CAE + angle C = 49° + 30° = 79°.

Therefore The correct answer is 79°.

Alternate Method

Given:

In triangle ABC, BD perpendicular to AC at D.

angle DBC = 60°

angle CAE = 49°

Formula Used:

1. Angle Sum Property: The sum of angles in a triangle is 180°.

2. Linear Pair Axiom: The sum of adjacent angles on a straight line is 180°.

Calculations:

Consider the right-angled triangle BDC (since BD perpendicular to AC, angle BDC = 90°):

=> angle BDC + angle DBC + angle BCD = 180°

=> 90° + 60° + angle BCD = 180°

=> angle BCD = 180° − 150° = 30°

=> angle ACE = 30° (since E lies on the line segment BC)

Now, consider triangle AEC:

=> angle AEC = 180° − (angle CAE + angle ACE)

=> angle AEC = 180° − (49° + 30°)

=> angle AEC = 180° − 79° = 101°

Since B, E, and C lie on a straight line, angle AEB and angle AEC form a linear pair:

=> angle AEB + angle AEC = 180°

=> angle AEB = 180° − 101° = 79°

Option Evaluation:

=> Option (1) 80°: Incorrect, as the calculated value of angle AEB is exactly 79°.

=> Option (2) 87°: Incorrect, as this does not satisfy the geometric relations of triangle AEC.

=> Option (3) 85°: Incorrect, as it deviates from the correct sum of 49° and 30°.

=> Option (4) 79°: Correct, as angle AEB = angle CAE + angle ACE = 49° + 30° = 79°.

Therefore The correct answer is 79°.

Additional Information

Exterior Angle Theorem

The measure of an exterior angle of a triangle is equal to the sum of the measures of its two remote interior angles. For any triangle, angle ext = angle int1 + angle int2.

Angle Sum Property of a Triangle

The sum of the interior angles of any triangle is always equal to 180° (π radians).

Linear Pair Axiom

If a ray stands on a line, then the sum of two adjacent angles so formed is 180°.

Q42. Answer: (b) 49

Shortcut Trick

Total weight of Rupesh, Mandar, and Ketan = 45 × 3 = 135 kg.

Weight of (Rupesh + Mandar) = 43 × 2 = 86 kg.

Weight of (Mandar + Ketan) = 49 × 2 = 98 kg.

Weight of Mandar = (Sum of both pairs) − (Total Sum) = (86 + 98) − 135.

Weight of Mandar = 184 − 135 = 49 kg.

Therefore The correct answer is 49 kg.

Alternate Method

Given:

Average weight of Rupesh (R), Mandar (M), and Ketan (K) = 45 kg.

Average weight of R and M = 43 kg.

Average weight of M and K = 49 kg.

Formula Used:

Sum of values = Average × Number of values

Calculations:

=> R + M + K = 45 × 3 = 135 kg ... (i)

=> R + M = 43 × 2 = 86 kg ... (ii)

=> M + K = 49 × 2 = 98 kg ... (iii)

=> (ii) + (iii) → R + 2M + K = 86 + 98 = 184 kg

=> (R + M + K) + M = 184 kg

=> 135 + M = 184 kg

=> M = 184 − 135

=> M = 49 kg

Therefore The correct answer is 49 kg.

Additional Information

Basic Average Formula

Average = (Sum of all observations) ÷ (Total number of observations).

Double Counting Logic

When a specific observation is included in two subsets, its value = (Sum of Subsets) − (Sum of Total Set).

Effect of Adding/Subtracting Constants

If every observation is increased or decreased by a constant 'k', the average also increases or decreases by 'k'.

Q43. Answer: (a) −86x + 124

Shortcut Trick

Multiply the coefficients directly to identify the cancellation or combination.

Coefficient of x^2: (2 × 2.5) − (5 × 1) = 5 − 5 = 0.

Coefficient of x: (2 × −28) − (5 × 6) = −56 − 30 = −86.

Constant term: (2 × 17) − (5 × −18) = 34 + 90 = 124.

The resulting expression is −86x + 124.

Therefore The correct answer is −86x + 124.

Alternate Method

Given Expression: $2((5/2)x^2 − 28x + 17) − 5(x^2 + 6x − 18)$

Formula Used: Distributive Law a(b + c + d) = ab + ac + ad

=> $2 \times (5/2)x^2 - 2 \times 28x + 2 \times 17 - 5 \times x^2 - 5 \times 6x - 5 \times (-18)$

=> $5x^2 - 56x + 34 - 5x^2 - 30x + 90$

=> $(5x^2 - 5x^2) + (-56x - 30x) + (34 + 90)$

=> $0x^2 - 86x + 124$

=> $-86x + 124$

Therefore The correct answer is $-86x + 124$.

Additional Information

Like Terms

In algebra, terms having the same variable with the same power are called like terms and can be added or subtracted.

Sign Rules for Multiplication

Multiplying a negative number by a negative number results in a positive product (− × − = +).

BODMAS Rule

Always solve terms inside brackets first, followed by multiplication before performing addition or subtraction in an algebraic expression.

Q44. Answer: (b) 678/191 hours

Shortcut Trick

Total Work = LCM of filling times = LCM(17, 24, 18) = 17 × 72 = 1224 units.

Combined Efficiency = (1224 ÷ 17) + (1224 ÷ 24) + (1224 ÷ 18) = 72 + 51 + 68 = 191 units/hr.

Time Taken = Total Work ÷ Combined Efficiency = 1224 ÷ 191 = 6(78/191) hours.

Therefore The correct answer is 6(78/191) hr.

Alternate Method

Given: Time for Pipe A = 17 hrs, Pipe B = 24 hrs, Pipe C = 18 hrs.

Person	Days	Total Work	Efficiency
Pipe A	17	1224	72
Pipe B	24	51	
Pipe C	18	68	

=> Total combined efficiency of A + B + C = 72 + 51 + 68

=> Combined Efficiency = 191 units/hr

=> Total Time = Total Work ÷ Combined Efficiency

=> Total Time = 1224 ÷ 191

=> Total Time = 6(78/191) hours

Therefore The correct answer is 6(78/191) hr.

Additional Information

Combined Work Formula

For three pipes filling a tank, the total time T is given by 1/T = 1/t1 + 1/t2 + 1/t3.

Pipes and Cisterns Efficiency

Filling pipes have positive efficiency, while outlet (leakage) pipes have negative efficiency.

LCM Method

Total capacity of the tank is assumed as the LCM of the individual times to simplify calculations into integers.

Q45. Answer: (b) Rs. 536

Shortcut Trick

The ratio of investment is 1430 : 1680 : 1340, which simplifies to 143 : 168 : 134.

Total ratio units = 143 + 168 + 134 = 445 units.

Total profit of 1780 corresponds to 445 units.

Multiplier = 1780 ÷ 445 = 4.

Avinash's profit share = 134 × 4 = 536.

Therefore The correct answer is Rs. 536.

Alternate Method

Given: Neha's investment = Rs. 1,430, Rajat's investment = Rs. 1,680, Avinash's investment = Rs. 1,340, Total Profit = Rs. 1,780.

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Formula: Profit Share = (Individual Investment ÷ Total Investment) × Total Profit.
=> Investment Ratio = 1430 : 1680 : 1340 = 143 : 168 : 134.
=> Sum of Ratios = 143 + 168 + 134 = 445.
=> Avinash's Profit Share = (134 ÷ 445) × 1780.
=> Avinash's Profit Share = 134 × 4 = 536.
Therefore The correct answer is Rs. 536.
Additional Information
Partnership Profit Distribution
When time periods of investment are the same, the profit is shared in the ratio of capital invested.
Variable Time Period
If time periods differ, profit ratio = (Capital1 × Time1) : (Capital2 × Time2).

Q46. Answer: (d) 33.75

Shortcut Trick
Direct Calculation:
Value 1 = 0.65 × 75 = 48.75
Value 2 = (3 ÷ 5) × 25 = 3 × 5 = 15
Difference = 48.75 − 15 = 33.75
Therefore The correct answer is 33.75.
Alternate Method
Given values:
First number = 65% of 75
Second number = 3/5 of 25
Calculations:
=> First number = (65 ÷ 100) × 75
=> First number = 0.65 × 75 = 48.75
=> Second number = (3 ÷ 5) × 25
=> Second number = 3 × 5 = 15
=> Required difference = 48.75 − 15
=> Required difference = 33.75
Therefore The correct answer is 33.75.
Additional Information
Percentage to Decimal
To convert a percentage to a decimal, divide by 100 or move the decimal point two places to the left.
Fraction to Value
To find a fraction of a number, multiply the number by the numerator and divide by the denominator.
Percentage Change
Percentage change = [(New Value − Old Value) ÷ Old Value] × 100.

Q47. Answer: (a) 9.4

Shortcut Trick
Equate the number of decimal places: 4.70 and 0.04.
Remove decimals and find LCM of 470 and 4.
LCM(470, 4) = 940.
Place the decimal back at 2 places: 9.40.
Therefore The correct answer is 9.4.
Alternate Method
Given: Numbers are 4.7 and 0.04.
Formula: LCM of fractions = LCM of Numerators ÷ HCF of Denominators
=> Convert decimals to like fractions: 4.7 = 470/100 and 0.04 = 4/100.
=> Numerators = 470, 4 and Denominators = 100, 100.
=> LCM(470, 4): 470 = 2 × 5 × 47; 4 = 2^2. LCM = 2^2 × 5 × 47 = 940.

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=> HCF(100, 100) = 100.

=> Required LCM = 940 ÷ 100 = 9.4.

Therefore The correct answer is 9.4.

Additional Information

HCF of Fractions

The HCF of a set of fractions is calculated as HCF of Numerators ÷ LCM of Denominators.

Decimal Normalization

Before finding LCM/HCF of decimals, always ensure all numbers have the same number of digits after the decimal point by adding trailing zeros.

Relation between LCM and HCF

For two numbers a and b, the product of the numbers is equal to the product of their LCM and HCF: a × b = LCM × HCF.

Q48. Answer: (d) 58.3

Shortcut Trick

Average Speed = Total Distance ÷ Total Time

Total Distance = 488 + 468 + 210 = 1166 km

Total Time = (488/61) + (468/78) + (210/35) = 8 + 6 + 6 = 20 hours

Average Speed = 1166 ÷ 20 = 58.3 km/hr

Therefore The correct answer is 58.3 km/hr.

Alternate Method

Given:

Distance1 = 488 km, Speed1 = 61 km/hr

Distance2 = 468 km, Speed2 = 78 km/hr

Distance3 = 210 km, Speed3 = 35 km/hr

Formula Used:

Time = Distance ÷ Speed

Average Speed = (Total Distance) ÷ (Total Time)

Calculations:

=> Time1 = 488 ÷ 61 = 8 hours

=> Time2 = 468 ÷ 78 = 6 hours

=> Time3 = 210 ÷ 35 = 6 hours

=> Total Distance = 488 + 468 + 210 = 1166 km

=> Total Time = 8 + 6 + 6 = 20 hours

=> Average Speed = 1166 ÷ 20 = 58.3 km/hr

Therefore The correct answer is 58.3 km/hr.

Additional Information

Average Speed (Equal Distances)

If two equal distances are covered at speeds u and v, then Average Speed = (2uv) ÷ (u + v).

Relative Speed

When two objects move in the same direction, relative speed is the difference of speeds (S1 − S2). In opposite directions, it is the sum (S1 + S2).

Unit Conversion

To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Q49. Answer: (d) 18

Shortcut Trick

For two numbers a and b, the third proportional x is given by $x = b^2 / a$.

Given: a = 50 and b = 30.

=> x = (30 × 30) ÷ 50

=> x = 900 ÷ 50 = 18.

Therefore The correct answer is 18.

Alternate Method

Given: First number = 50, Second number = 30, Third proportional = x.

Formula Used: If a, b, and c are in continued proportion, then a : b = b : c.

Calculations:

=> 50 : 30 = 30 : x

=> 50 / 30 = 30 / x

=> 50 × x = 30 × 30

=> 50x = 900

=> x = 900 ÷ 50

=> x = 18

Therefore The correct answer is 18.

Additional Information

Mean Proportional

The mean proportional between two numbers a and b is √(a × b).

Fourth Proportional

For three numbers a, b, and c, the fourth proportional x is calculated such that a : b = c : x, which means x = (b × c) / a.

Duplicate Ratio

The duplicate ratio of a : b is $a^2 : b^2$.

Q50. Answer: (c) 10

Shortcut Trick

Let Mary's age be M and Dia's age be D.

From the second condition: M = 3D + 2

Substitute in the first condition: 3(3D + 2) = 5D + 22

=> 9D + 6 = 5D + 22 => 4D = 16 => D = 4

=> M = 3(4) + 2 = 14. Difference = 14 − 4 = 10.

Therefore The correct answer is 10 years.

Alternate Method

Given:

Equation 1: 3 × Mary's age = 5 × Dia's age + 22

Equation 2: 3 × Dia's age = Mary's age − 2

Calculations:

=> From Eq 2: M = 3D + 2

=> Substitute M in Eq 1: 3(3D + 2) = 5D + 22

=> 9D + 6 = 5D + 22

=> 9D − 5D = 22 − 6

=> 4D = 16

=> D = 4 years (Dia's age)

=> M = 3(4) + 2 = 14 years (Mary's age)

=> Difference = M − D = 14 − 4 = 10 years

Therefore The correct answer is 10 years.

Additional Information

Linear Equations in Two Variables

A system of equations like ax + by = c can be solved using substitution or elimination methods to find individual values.

Age Relation Problems

Always define present ages as variables. If the age ratio 'n' years ago is given, subtract 'n' from the present ages before forming the equation.

Q51. Answer: (b) 144

Shortcut Trick

Surface area of a sphere is proportional to the square of its radius (Area prop. to r^2).

Ratio of Radii = 1 : 12

Ratio of Surface Areas = $1^2 : 12^2 = 1 : 144$

The surface area becomes 144 times its original value.

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Therefore The correct answer is 144.

Alternate Method

Given: Initial radius = r, New radius (R) = 12r

Formula Used: Surface Area of Sphere = $4\pi r^2$

=> Initial Surface Area (A1) = $4\pi r^2$

=> New Surface Area (A2) = $4\pi(12r)^2$

=> A2 = $4\pi \times 144r^2$

=> A2 = $144 \times (4\pi r^2)$

=> A2 = 144 × A1

Therefore The correct answer is 144.

Additional Information

Volume of a Sphere

The volume of a sphere is given by $V = (4/3)\pi r^3$. If the radius is increased n times, the volume increases by n^3 times.

Hemisphere Calculations

For a hemisphere, the Curved Surface Area is $2\pi r^2$ and the Total Surface Area is $3\pi r^2$.

Ratio of Areas vs Radii

In any 3D shape, the ratio of areas is the square of the ratio of their corresponding linear dimensions (side, radius, or height).

Q52. Answer: (a) 6 hours 30 minutes

Shortcut Trick

Time gained or lost depends on the difference between walking and driving speeds.

Time saved by driving both ways instead of walking/driving = 2 hours.

This means driving saves 2 hours compared to walking for a one-way trip.

Total time for walking both ways = (Time for walk/drive) + (Time saved by driving) = 4 hr 30 min + 2 hr = 6 hr 30 min.

Therefore The correct answer is 6 hr 30 min.

Alternate Method

Given:

Time for (Walk + Drive) = 4 hours 30 minutes = 4.5 hours

Time for (Drive + Drive) = 4 hours 30 minutes − 2 hours = 2 hours 30 minutes = 2.5 hours

Let W be the time taken to walk one way and D be the time taken to drive one way.

=> W + D = 4.5 hours --- (1)

=> 2D = 2.5 hours => D = 1.25 hours --- (2)

Substitute D in equation (1):

=> W + 1.25 = 4.5

=> W = 4.5 − 1.25 = 3.25 hours

Time to walk both ways = 2W

=> 2W = 2 × 3.25 = 6.5 hours

=> 6.5 hours = 6 hours 30 minutes

Therefore The correct answer is 6 hr 30 min.

Additional Information

Average Speed

Average speed is the total distance divided by the total time taken: Avg Speed = Total Distance ÷ Total Time.

Time-Speed Inverse Relation

For a constant distance, time is inversely proportional to speed (T prop. to 1/S). If speed doubles, time is halved.

Walking and Driving Logic

The difference between (Walk + Walk) and (Walk + Drive) is the same as the difference between (Walk + Drive) and (Drive + Drive).

Q53. Answer: (c) 31

Given:

67 - 9 × [4 + 3 × {16 - 8 (6 - 5) × 2} ÷ 32]

Formula Used:

Order of operations: Parentheses → E×ponents → Multiplication/Division (from left to right) → Addition/Subtraction (from left to right).

Calculation:

=> 67 - 9 × [4 + 3 × {16 - 8 (1) × 2} ÷ 32]

=> 67 - 9 × [4 + 3 × {16 - 16} ÷ 32]

=> 67 - 9 × [4 + 3 × 0 ÷ 32]

=> 67 - 9 × [4 + 0]

=> 67 - 9 × 4

=> 67 - 36

=> 31

Therefore The correct answer is 31.

Q54. Answer: (a) Rs. 156

Shortcut Trick

Let original cost of a pen be x and a pencil be y.

New cost of 8 pens and 2 pencils = 8(x − 6) + 2(y + 9) = 72 => 8x + 2y = 72 + 48 − 18 = 102.

Solving 10x + 3y = 129 and 4x + y = 51 × 3 => 12x + 3y = 153.

Difference: 2x = 24 => x = Rs. 12; Substituting back: y = 51 − 48 = Rs. 3.

Required: 9(12) + 16(3) = 108 + 48 = Rs. 156.

Therefore The correct answer is Rs. 156.

Alternate Method

Given:

Initial: 10 pens + 3 pencils = Rs. 129

Final: 8(pen − 6) + 2(pencil + 9) = Rs. 72

Calculations:

Let P be cost of 1 pen and p be cost of 1 pencil.

=> 10P + 3p = 129 --- (Eq. 1)

=> 8(P − 6) + 2(p + 9) = 72

=> 8P − 48 + 2p + 18 = 72

=> 8P + 2p = 102 => 4P + p = 51 --- (Eq. 2)

=> Multiply Eq. 2 by 3: 12P + 3p = 153 --- (Eq. 3)

=> Subtract Eq. 1 from Eq. 3: (12P − 10P) = 153 − 129

=> 2P = 24 => P = 12

=> Put P = 12 in Eq. 2: 4(12) + p = 51 => 48 + p = 51 => p = 3

=> Cost of 9 pens and 16 pencils = 9 × 12 + 16 × 3

=> 108 + 48 = 156

Therefore The correct answer is Rs. 156.

Additional Information

Linear Equations in Two Variables

Equations of the form ax + by = c represent a straight line. To solve for two variables, at least two independent equations are required.

Elimination Method

The process of removing one variable by making its coefficients equal in both equations and then adding or subtracting the equations.

Substitution Method

Expressing one variable in terms of the other from one equation and substituting it into the second equation to find the value.

Q55. Answer: (d) 144

Shortcut Trick

In Simple Interest, the interest rate remains constant for every period.

Total interest percentage for 4 months = 3% × 4 = 12%

Simple Interest = 12% of Rs. 1,200

SI = 12 × 12 = 144

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Therefore The correct answer is Rs. 144.
Alternate Method
Given:
Principal (P) = Rs. 1,200
Interest Rate (R) = 3% per month
Time (T) = 4 months
Formula Used:
Simple Interest (SI) = (P × R × T) ÷ 100
Calculations:
=> SI = (1200 × 3 × 4) ÷ 100
=> SI = 12 × 3 × 4
=> SI = 36 × 4
=> SI = Rs. 144
Therefore The correct answer is Rs. 144.
Additional Information
Total Amount (A)
The final value after adding interest to the principal is called the Amount. Formula: A = P + SI.
Rate and Time Units
Always ensure that the Rate and Time are in the same unit (e.g., both per month or both per year) before calculation.
Simple vs Compound Interest
In SI, interest is calculated only on the principal, whereas in CI, interest is calculated on the principal plus accumulated interest.

Q56. Answer: (b) Rs. 50

Shortcut Trick
Discount is calculated on the Marked Price.
Discount = 10% of 500.
10% of 500 = 500 ÷ 10 = 50.
Therefore The correct answer is Rs. 50.
Alternate Method
Given: Marked Price (MP) = Rs. 500, Discount% = 10%.
Formulas: Discount = MP × (Discount% ÷ 100)
=> Discount = 500 × (10 ÷ 100)
=> Discount = 500 × 0.1
=> Discount = 50
Therefore The correct answer is Rs. 50.
Additional Information
Marked Price (MP) and Selling Price (SP)
The Marked Price is the price printed on the label. Selling Price = Marked Price − Discount.
Discount Percentage
Discount% = (Discount ÷ Marked Price) × 100.

Q57. Answer: (b) -16

Given:
Expression = $2^2 + \sqrt{(5^2)} - 3\sqrt{25} - 10$
Formula Used:
Square root of $a^2 = a$
Exponent rule for powers
Calculation:
=> $2^2 = 4$
=> $\sqrt{(5^2)} = 5$
=> $\sqrt{25} = 5$
=> $3\sqrt{25} = 15$

=> 4 + 5 − 15 − 10 = −16

Therefore The correct answer is −16.

Q58. Answer: (b) 1944

Shortcut Trick

Identify if the sides form a Pythagorean triplet.

Divide sides 54, 72, 90 by 18 → 3, 4, 5. (Standard triplet)

Since it is a right-angled triangle, Area = 1/2 × base × height.

Area = 1/2 × 54 × 72 = 27 × 72 = 1944 cm².

Therefore The correct answer is 1944 cm².

Alternate Method

Given: Sides a = 72 cm, b = 90 cm, c = 54 cm.

Formula Used: Heron's Formula Area = √[s(s−a)(s−b)(s−c)], where s = (a+b+c)/2.

=> Semi-perimeter (s) = (72 + 90 + 54) / 2

=> s = 216 / 2 = 108 cm

=> Area = √[108 × (108 − 72) × (108 − 90) × (108 − 54)]

=> Area = √[108 × 36 × 18 × 54]

=> Area = √[(54 × 2) × 36 × 18 × 54] = √[54² × 36 × 36]

=> Area = 54 × 36 = 1944 cm²

Therefore The correct answer is 1944 cm².

Additional Information

Right-Angled Triangle Property

If a² + b² = c², the triangle is right-angled and its area is simply 1/2 × base × height.

Heron's Formula

Used for any triangle with sides a, b, and c: Area = √[s(s−a)(s−b)(s−c)] where s is the semi-perimeter.

Equilateral Triangle Area

For a triangle with all sides equal to 'a', Area = (√3 / 4) × a².

Q59. Answer: (d) Rs. 14,112

Shortcut Trick

Total interest percentage for first case = 5.9 × 9.5 = 56.05%

Given, 56.05% of sum = Rs. 6,726 => 1% of sum = 6726 ÷ 56.05 = 120

Interest percentage for second case = 5.6 × (22/7) = 0.8 × 22 = 17.6%

Required amount payable = 100% (Principal) + 17.6% (Interest) = 117.6%

Value = 120 × 117.6 = Rs. 14,112

Therefore The correct answer is Rs. 14,112.

Alternate Method

Given:

Case 1: Simple interest (SI1) = Rs. 6,726, Rate (R1) = 5.9%, Time (T1) = 19/2 = 9.5 years

Case 2: Rate (R2) = 5.6%, Time (T2) = 22/7 years

Formula Used:

SI = (P × R × T) / 100 | Amount (A) = Principal (P) + SI

=> SI1 = (P × 5.9 × 9.5) / 100

=> 6726 = (P × 56.05) / 100

=> P = (6726 × 100) ÷ 56.05 = Rs. 12,000

=> SI2 = (12000 × 5.6 × 22/7) ÷ 100

=> SI2 = 120 × 0.8 × 22 = Rs. 2,112

=> Amount payable = P + SI2 = 12000 + 2112 = Rs. 14,112

Therefore The correct answer is Rs. 14,112.

Additional Information

Simple Interest Concepts

The principal remains constant throughout the period. SI is calculated only on the initial sum invested or borrowed.

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Effective Rate of Interest

The net interest percentage over time T at rate R is (R × T)%. If the sum is constant, SI is directly proportional to (R × T).

Amount Payable

Total amount A = P(1 + RT/100). For simple interest, the amount increases linearly with time.

Q60. Answer: (d) 88

Shortcut Trick

Product of H.C.F. and L.C.M. = Product of the two numbers.

11 × 440 = 55 × Other Number

Other Number = (11 × 440) ÷ 55 = 440 ÷ 5 = 88

Therefore The correct answer is 88.

Alternate Method

Given:

H.C.F. = 11

L.C.M. = 440

First Number (a) = 55

Formula Used:

H.C.F. × L.C.M. = a × b

Calculations:

=> Let the other number be b.

=> 11 × 440 = 55 × b

=> 4840 = 55b

=> b = 4840 ÷ 55

=> b = 88

Therefore The correct answer is 88.

Additional Information

H.C.F. Property

The Highest Common Factor (H.C.F.) of two or more numbers is the largest number that divides each of them exactly. H.C.F. is always a factor of the L.C.M.

L.C.M. Property

The Least Common Multiple (L.C.M.) is the smallest non-zero common multiple of two or more numbers.

Co-prime Numbers

For two co-prime numbers, their H.C.F. is always 1 and their L.C.M. is equal to the product of the numbers.

Q61. Answer: (a) 920/19% loss

Shortcut Trick

Total Cost Price (CP) = 849 + 6 = 855.

Selling Price (SP) = 441.

Since SP < CP, there is a Loss.

Loss = 855 − 441 = 414.

Loss% = (414 ÷ 855) × 100.

Loss% = (41400 ÷ 855) = 920/19%.

Therefore The correct answer is 920/19% loss.

Alternate Method

Given: Purchase Price = 849, Decoration Cost = 6, Selling Price (SP) = 441.

Formulas: Total CP = Purchase Price + Overhead Expenses | Loss = CP − SP | Loss% = (Loss ÷ CP) × 100

=> Total Cost Price (CP) = 849 + 6 = 855.

=> Selling Price (SP) = 441.

=> Loss = 855 − 441 = 414.

=> Loss Percentage = (414 ÷ 855) × 100.

=> Dividing both 414 and 855 by 9: (46 ÷ 95) × 100.

=> Dividing by 5: 46 × (20 ÷ 19) = 920/19%.

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Therefore The correct answer is 920/19% loss.

Additional Information

Total Cost Price

Total CP includes the buying price plus all overhead expenses like repairs, decoration, or transportation.

Profit and Loss Condition

If SP > CP, it results in a Profit. If CP > SP, it results in a Loss.

Q62. Answer: (c) 11.04

Given:

Expression = √169 + √0.0196 − √4.41

Formula Used:

Square root of a perfect square

Calculation:

=> √169 = 13

=> √0.0196 = 0.14

=> √4.41 = 2.1

=> 13 + 0.14 − 2.1 = 11.04

Therefore The correct answer is 11.04.

Q63. Answer: (b) Rs. 50,600

Shortcut Trick

Ratio of Profit = Ratio of Investment (since time period is same).

Total Profit = Rs. 14,400 | Mohsin share = Rs. 2,600 | Abdul share = 14,400 − 2,600 = Rs. 11,800.

Investment Ratio (Abdul : Mohsin) = 11,800 : 2,600 = 118 : 26 = 59 : 13.

Difference in ratio parts = 59 − 13 = 46 units | Total parts = 59 + 13 = 72 units.

Value of 46 units = (Total Investment ÷ 72) × 46 = (79,200 ÷ 72) × 46 = 1,100 × 46 = Rs. 50,600.

Therefore The correct answer is Rs. 50,600.

Alternate Method

Given → Total Investment = Rs. 79,200 | Total Profit = Rs. 14,400 | Mohsin Profit = Rs. 2,600.

Formulas → Profit Ratio = Investment Ratio (for same time) | Profit_A = Total Profit − Profit_M | Difference = Investment_A − Investment_M.

=> Abdul Profit = 14,400 − 2,600 = Rs. 11,800.

=> Investment Ratio (Abdul : Mohsin) = 11,800 : 2,600 = 59 : 13.

=> Let Abdul investment be 59x and Mohsin be 13x.

=> 59x + 13x = 79,200 => 72x = 79,200 => x = 1,100.

=> Difference = 59x − 13x = 46x = 46 × 1,100 = Rs. 50,600.

Therefore The correct answer is Rs. 50,600.

Additional Information

Partnership Basics

When time periods are equal, the ratio of profits is directly proportional to the ratio of capitals (investments) invested by partners.

Variable Time Partnership

If time periods are different, Profit Ratio = (Capital1 × Time1) : (Capital2 × Time2).

Q64. Answer: (a) decrease by Rs. 2,751

Shortcut Trick

Income 100, Savings 25, Expenditure 75. Ratio E : S = 3 : 1.

Net change in income (27%) = (Exp % change × 3 + Sav % change × 1) ÷ 4

27 = (40 × 3 + x × 1) ÷ 4 => 108 = 120 + x => x = −12%.

Savings decrease by 12% of (91,700 × 25%) = 91,700 × 0.25 × 0.12 = Rs. 2,751.

Therefore The correct answer is decrease by Rs. 2,751.

Alternate Method

Given:

Initial Income = Rs. 91,700

Initial Savings = 25% of 91,700 = Rs. 22,925

Initial Expenditure = 75% of 91,700 = Rs. 68,775

New Calculations:

=> New Income = 91,700 + (27% of 91,700) = 91,700 + 24,759 = Rs. 1,16,459

=> New Expenditure = 68,775 + (40% of 68,775) = 68,775 + 27,510 = Rs. 96,285

=> New Savings = New Income − New Expenditure = 1,16,459 − 96,285 = Rs. 20,174

=> Change in Savings = 20,174 − 22,925 = −Rs. 2,751

Therefore The correct answer is decrease by Rs. 2,751.

Additional Information

Income, Expenditure, and Savings Relation

Income = Expenditure + Savings. This basic identity is the foundation for all percentage change problems involving household budgets.

Alligation in Income Problems

The % change in Income is the weighted average of % changes in Expenditure and Savings, weighted by their respective initial values.

Direct Ratio Method

If Income increases by I%, Exp by E%, and Savings by S%, then Total × I = Exp × E + Sav × S.

Q65. Answer: (d) 45/4

Shortcut Trick

Assume Total Work = LCM of 30, 18, and 9 = 90 units.

Efficiency of Shifa = 90 ÷ 30 = 3 units/day.

Efficiency of Shifa + Afiya = 90 ÷ 18 = 5 units/day.

Efficiency of Shifa + Afiya + Mariyam = 90 ÷ 9 = 10 units/day.

Efficiency of Mariyam = (Shifa + Afiya + Mariyam) − (Shifa + Afiya) = 10 − 5 = 5 units/day.

Combined efficiency of Shifa and Mariyam = 3 + 5 = 8 units/day.

Time taken = 90 ÷ 8 = 45/4 days.

Therefore The correct answer is 45/4 days.

Alternate Method

Given:

Time taken by Shifa (S) = 30 days

Time taken by Shifa and Afiya (S + A) = 18 days

Time taken by Shifa, Afiya and Mariyam (S + A + M) = 9 days

Person	Days	Total Work	Efficiency
Shifa (S)	30	90	3
Shifa + Afiya (S + A)	18	5	
Shifa + Afiya + Mariyam (S + A + M)	9	10	

Calculations:

=> Efficiency of Shifa = 3 units/day

=> Efficiency of Afiya = (S + A) − S = 5 − 3 = 2 units/day

=> Efficiency of Mariyam = (S + A + M) − (S + A) = 10 − 5 = 5 units/day

=> Efficiency of Shifa and Mariyam together = 3 + 5 = 8 units/day

=> Time taken by Shifa and Mariyam = Total Work ÷ Combined Efficiency

=> Time taken = 90 ÷ 8 = 45/4 days

Therefore The correct answer is 45/4 days.

Additional Information

Work Efficiency Principle

Efficiency is inversely proportional to time. If a person completes work in D days, efficiency = 1/D per day.

Combined Work Formula

If A can do work in x days and B in y days, together they take (x × y) ÷ (x + y) days.

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Total Work Assumption

Using the LCM (Least Common Multiple) of individual time periods as total work simplifies calculations by providing integer efficiency values.

Q66. Answer: (a) 2

Shortcut Trick

For any equation of the form x + 1/x = 2, the only possible value for x is 1.

Since cosec θ = 1/sin θ, the given equation is 1/sin θ + sin θ = 2.

Thus, sin θ = 1 and cosec θ = 1.

Substituting these values: 1^6 + 1^6 = 1 + 1 = 2.

Therefore The correct answer is 2.

Alternate Method

Given: cosec θ + sin θ = 2

Formula Used: cosec θ = 1/sin θ

=> 1/sin θ + sin θ = 2

=> (1 + $\sin^2$ θ) / sin θ = 2

=> 1 + $\sin^2$ θ = 2 sin θ

=> $\sin^2$ θ − 2 sin θ + 1 = 0

=> $(\sin \theta - 1)^2 = 0$

=> sin θ = 1

=> cosec θ = 1/1 = 1

=> cosec^6 θ + sin^6 θ = (1)^6 + (1)^6

=> 1 + 1 = 2

Therefore The correct answer is 2.

Additional Information

Reciprocal Identities

Trigonometric ratios and their reciprocals follow the property: sin θ × cosec θ = 1, cos θ × sec θ = 1, and tan θ × cot θ = 1.

Sum of Reciprocals Rule

If x + 1/x = 2, then $x^n + 1/x^n = 2$ for all positive integer values of n because x must be 1.

Trigonometric Specific Values

When sin θ = 1, the angle θ = 90° (or π/2 radians).

Q67. Answer: (d) 26

Given:

$2^3 - 3^2 + (2 \div 2)^2 - 2 + 4 \times 7$

Formula Used:

Order of operations: exponents, then division and multiplication, then addition and subtraction

Calculation:

=> $2^3 - 3^2 + (2 \div 2)^2 - 2 + 4 \times 7$ =

=> 8 − 9 + 1 − 2 + 28

=> 0 - 2 + 28

=> 26

Therefore The correct answer is 26.

Q68. Answer: (c) 494.50

Shortcut Trick

Net discount multiplier = 0.90 × 0.86 = 0.774.

Cost Price (CP) for buyer = 500 × 0.774 = Rs. 387.

Required Selling Price (SP) = 387 × 1.15 = Rs. 445.05.

New List Price (MP) = SP ÷ 0.90 = 445.05 ÷ 0.90 = Rs. 494.50.

Therefore The correct answer is Rs. 494.50.

Alternate Method

Given → Initial List Price = Rs. 500, Discounts = 10% and 14%, Profit = 15%, New Discount = 10%.

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

=> Price after 1st discount = 500 − (10% of 500) = Rs. 450.

=> Price after 2nd discount (CP for buyer) = 450 − (14% of 450) = 450 − 63 = Rs. 387.

=> Desired SP with 15% profit = 387 × 1.15 = Rs. 445.05.

=> Since 10% discount is given on new List Price (MP), 0.90 × MP = 445.05.

=> New List Price = 445.05 ÷ 0.9 = Rs. 494.50.

Therefore The correct answer is Rs. 494.50.

Additional Information

Successive Discounts

Two successive discounts of a% and b% are equivalent to a single discount of (a + b − ab/100)%.

Relation between MP and CP

The ratio of Marked Price to Cost Price is given by MP/CP = (100 + Profit%)/(100 − Discount%).

Q69. Answer: (c) 68%

Shortcut Trick

Successive percentage method: Profit% = 48% and Weight Error = 12% less.

Effective Profit Multiplier = (100 + 48) ÷ (100 − 12) = 148 ÷ 88.

Total Profit% = [(148 − 88) ÷ 88] × 100 = (60 ÷ 88) × 100.

Total Profit% = (15 ÷ 22) × 100 = 68.18% ≈ 68%.

Therefore The correct answer is 68%.

Alternate Method

Given → Profit claimed = 48%, Weight reduction = 12%.

Formulas: Profit% = (Total Gain ÷ Actual Weight) × 100 | Dishonest gain% = [Error + Profit%] ÷ [True Value − Error] × 100.

=> Let the cost price of 1000g be 1000 units.

=> Selling Price (SP) = 1000 + 48% of 1000 = 1480 units.

=> Actual weight used = 1000 − 12% of 1000 = 880g.

=> The effective cost price for the trader = 880 units.

=> Total Profit = 1480 − 880 = 600 units.

=> Profit% = (600 ÷ 880) × 100 = 68.18%.

=> Rounding off to the nearest whole number gives 68%.

Therefore The correct answer is 68%.

Additional Information

Dishonest Dealer Concept

A dealer can earn profit by two ways: increasing the Selling Price and using False Weights. Total Gain% = [(True Weight − False Weight) + Profit% on True Weight] ÷ [False Weight] × 100.

Rounding Off Rules

If the decimal part is 0.5 or more, round up; if it is less than 0.5, round down. Here 68.18% rounds to 68%.

Q70. Answer: (b) 193.5

Shortcut Trick

Total Sum of 5 numbers = 655

Sum of first two numbers = 80 × 2 = 160

Third number = 108

Sum of remaining two numbers = 655 − (160 + 108) = 387

Average of remaining two = 387 ÷ 2 = 193.5

Therefore The correct answer is 193.5.

Alternate Method

Given:

Total numbers = 5

Sum of 5 numbers = 655

Average of first 2 numbers = 80

Third number = 108

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Formula Used:

Sum = Average × Total numbers

Average = Sum ÷ Total numbers

=> Sum of the first two numbers = 80 × 2 = 160

=> Sum of the first three numbers = 160 + 108 = 268

=> Sum of the remaining two numbers = 655 − 268

=> Sum of the remaining two numbers = 387

=> Average of the remaining two numbers = 387 ÷ 2

=> Average = 193.5

Therefore The correct answer is 193.5.

Additional Information

Basic Average Formula

The arithmetic mean or average is the ratio of the sum of all observations to the total number of observations.

Weighted Average

If there are groups with averages A1, A2,... and sizes n1, n2,..., the combined average is (n1A1 + n2A2 + ...) ÷ (n1 + n2 + ...).

Net Deviation

The sum of deviations of all observations from their arithmetic mean is always equal to zero.

Q71. Answer: (c) 6

Given number 4562734

1 is added to each even digit and 2 is subtracted from each odd digit in the number

= 7 - 1.

= 6.

Hence, the correct answer is "Option 3"

Q72. Answer: (d) WASH - SWAH - HSAW

The logic follows here,

Similarly,

Hence, the correct answer is "Option 4"

Q73. Answer: (d) One

Seven people, I, J, K, L, M, N and O, are sitting in a row, facing north.

• Only two people sit to the left of K.

• Only three people sit between K and L.

• Only one person sits between L and J.

• N sits to the immediate left of I.

• M is not an immediate neighbour of L

The Final Arrangement is,

Hence, the correct answer is "Option 4"

Q74. Answer: (c) FBMO

The logic followed here is:

Hence, the correct answer is "Option 3"

Q75. Answer: (c) 8 km towards the south

Riya starts from Point P and drives 8 km towards the south.

• Then she takes a right turn, drives 11 km, she turns right again and drives 14 km.

• She then takes a right turn and drives 15 km.

• Then she takes left turn and drives 2 km, she takes a left turn again and drives 4 km and stops at Point Q

The Final Diagram,

Hence, the correct answer is "Option 3"

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Q76. Answer: (c) 8

'DONT' is coded as '1097' and 'NATO' is coded as '0187'

'DONT' - '1097'

'NATO' - '0187'

1 0 7 and O,N,T common in both number and words.

Code for A is 8.

Hence, the correct answer is "Option 3"

Q77. Answer: (d) 9

Given (Left) 4138 2345 6367 5353 1276 (Right)

Second digit of the second largest number - 5353

Second digit of the largest number - 6367.

Resultant = 3 x 3 = 9.

Hence, the correct answer is "Option 4"

Q78. Answer: (a) KO-RN

The logic followed here is:

Hence, the correct answer is "Option 1"

Q79. Answer: (a) Southwest

• Town T is to the west of Town S.

• Town U is to the south of Town T.

• Town V is to the west of Town U.

• Town W is to the south of Town V.

• Town X is to the west of Town W

The Final Diagram,

Hence, the correct answer is "Option 1"

Q80. Answer: (b) ICZ

The logic followed here is:

Hence, the correct answer is "Option 2"

Q81. Answer: (c) 563

The logic follows here,

Hence, the correct answer is "Option 3"

Q82. Answer: (b) Three

Seven boxes F, G, H, M, N, O and P are kept one over the other but not necessarily in the same order.

• O is kept immediately above F.

• G is kept immediately above M.

• Only P is kept above N.

• Only two boxes are kept above O.

The Final Arrangement is,

P
N
O
F
H
G
M

Hence, the correct answer is "Option 2"

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Q83. Answer: (b) 380

Given - 32 B 5 C 63 B 5 D 89 C 9 A 9 D 7 = ?

'A' stands for '÷', 'B' stands for '×', 'C' stands for '+' and 'D' stands for '−'.

BODMAS Rule:

32 × 5 + 63 × 5 − 89 + 9 ÷ 9 − 7 = ?

32 × 5 + 63 × 5 − 89 + 1 − 7 = ?

160 + 315 + 1 − 89 − 7 = ?

476 − 89 − 7 = ?

380.

Hence, the correct answer is "Option 2"

Q84. Answer: (c) 1

'LOAD' is coded as '5364' and 'GOLD' is coded as '4136'.

'LOAD' - '5364'

'GOLD' - '4136'

The code for G is 1.

Hence, the correct answer is "Option 3"

Q85. Answer: (a) Brother's wife

Preparing the family tree diagram by using the following symbols:

As per the given information:

Hence, the correct answer is "Option 1"

Q86. Answer: (b) Shiv

Karan, Shiv, Ritu, Himani, Gunjan and Pari are sitting in a straight line, facing north.

• Karan sits third to the left of Himani.

• Himani sits second from the right end.

• Pari sits to the immediate left of Gunjan.

• Shiv does not sit next to Karan.

The Final Arrangement is,

Hence, the correct answer is "Option 2"

Q87. Answer: (c) Only conclusion (I) follows.

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

Conclusions (I): Some spoons are caps. - True (Some caps are spoons and Some spoons are caps is True)

Conclusions (II): All caps are forks. - False (Some caps are spoons. All forks are spoons. All caps are forks is may be possible, but not definite. Hence, it is false.)

Only conclusion (I) follows.

Hence, the correct answer is "Option 3"

Q88. Answer: (c) VFRL

The logic followed here is:

Hence, the correct answer is "Option 3"

Q89. Answer: (d) (24, 14, 9)

Logic = First Number − Second Number = 2 (Second Number − Third Number)

Similarly,

Hence, the correct answer is "Option 4"

Q90. Answer: (b) 10

Given number 67849315

Arranged in ascending order from left to right - (Left) 1 3 4 5 6 7 8 9 (Right)

sum of the digits which are second from the left and third from the right in the new number = 7 + 3 = 10.

Hence, the correct answer is "Option 2"

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Q91. Answer: (c) Three

Given Series - (Left) 6 \ & > 3 @ 8 * & @ 7 1 ^ @ 4 ? \ ? 4 5 < (Right)

Required Condition : Symbol - Number - Symbol

(Left) 6 \ & > 3 @ 8 * & @ 7 1 ^ @ 4 ? \ ? 4 5 < (Right)

3 @, @ 8 * and @ 4 ?.

Hence, the correct answer is "Option 3"

Q92. Answer: (a) Only conclusion (I) follows.

The least possible Venn diagram is:

Conclusions:

(I) All gardens are meadows.- True (All gardens are forests.All forests are meadows.All gardens are meadows is True)

(II) All meadows are forests. - False(All forests are meadows.All meadows are forests is may be possible but not definite. Hence, it is false)

Only conclusion (I) follows.

Hence, the correct answer is "Option 1"

Q93. Answer: (d) 158

Given:

Mr. Toni rank from the top = 94th

Mr. Toni rank from the bottom = 65th

Total persons = (Rank from one end) + (Rank from other end) - 1

= 94^(th)+ 65^(th) - 1

= 159 - 1

= 158

Hence, the correct answer is "Option 4".

Q94. Answer: (b) 244

The logic follows here,

Hence, the correct answer is "Option 2"

Q95. Answer: (a) NIO

The logic followed here is:

Hence, the correct answer is "Option 1"

Q96. Answer: (b) 235

The logic follows here,

Hence, the correct answer is "Option 2"

Q97. Answer: (b) XCL 3

The logic followed here is:

Hence, the correct answer is "Option 2"

Q98. Answer: (a) KO-RW

The logic followed here is:

Hence, the correct answer is "Option 1"

Q99. Answer: (c) 63

Given 14 ÷ 4 + 78 × 13 − 13 = ?

+’ and ‘−’ are interchanged and ‘×’ and ‘÷’ are interchanged.

BODMAS Rule:

14 × 4 − 78 ÷ 13 + 13 = ?

14 × 4 − 6 + 13 = ?

56 + 13 − 6 = ?

69 − 6 = ?

63.

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Hence, the correct answer is "Option 3"

Q100. Answer: (d) 61

Given:

Raj rank from the top = 35th

Raj rank from the bottom = 27th

Total persons = (Rank from one end) + (Rank from other end) - 1

= 35 + 27 - 1

= 62 - 1

= 61 students.

Hence, the correct answer is "Option 4".

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