RRB NTPC Graduate Level CBT-I Official Paper (Held On: 06 Jun, 2025 Shift 3) (Previous Year Paper)

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

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Q1. Which of the following elements, when poorly implemented, is most likely to undermine the credibility and impact of an otherwise well-researched MS PowerPoint presentation?

(a) Embedding multimedia elements such as videos
(b) Inconsistent use of slide masters and templates
(c) The choice of transition effects between slides
(d) The inclusion of speaker notes for reference

Q2. Simplify : 72 ÷ [4/2 × {9 + 2 - (4 + 7 - (1 + 8))}]

(a) 4
(b) 12
(c) -1
(d) -4

Q3. In which year did the Bhil rebellion start under the leadership of Bhil leaders such as Kazi Singh and Bhima Naik?

(a) 1868
(b) 1803
(c) 1845
(d) 1818

Q4. After 50 litres of petrol was poured into an empty storage tank, it was still 10% empty. How much petrol (in litres, rounded off to two decimal places) must be poured into the storage tank in order to fill it?

(a) 56.56
(b) 54.56
(c) 55.56
(d) 51.33

Q5. Suraj ranked 18^(th) from the top and 67^(th)from the bottom in his class. How many students are there in his class?

(a) 85
(b) 83
(c) 82
(d) 84

Q6. According to Global Debt Report 2025, what was the share of central bank holdings of domestic sovereign bonds in OECD countries in 2024?

(a) 42%
(b) 25%
(c) 35%
(d) 19%

Q7. Which of the following indicators reflects inequality in the distribution of income among individuals in a population?

(a) Consumer Price Index
(b) Dependency Ratio
(c) Lorenz Curve
(d) Labour Force Participation Rate

Q8. Solubility of CH3COOH decreases in presence of CH3COONa due to:

(a) Oxidation
(b) Common ion effect
(c) Ion pairing
(d) Increased temperature

Q9. Which keyboard shortcut is used to save an MS Excel workbook?

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

Q10. The mode and median of data are 36.3 and 62, respectively. What is the mean of the data? (Use the empirical formula)

(a) 68.95
(b) 76.15
(c) 79.75
(d) 74.85

Q11. In a 2295 m circular race, Siddharth finishes one round in 85 seconds and Yash finishes one round in 45 seconds. How many different meeting points are there on the circumference if they are running in the opposite directions?

(a) 33
(b) 26
(c) 36
(d) 20

Q12. Sum and product of all roots of $4x^3 - 8x^2 - 13x + 19 = 0$ is :

(a) 3, (-17)/2
(b) 2, (-19)/4
(c) 1, (-17)/4
(d) 4, (-19)/2

Q13. A class of 30 students appeared in a test. The average score of 12 students is 60, and that of the rest is 60. What is the average score of the class?

(a) 59
(b) 60
(c) 61
(d) 58

Q14. In a certain code language, ‘flag dance best’ is coded as ‘xk tc kz’ and ‘mile flag wine’ is coded as ‘tc di gv’. How is ‘flag’ coded in the given language?

(a) xk
(b) kz
(c) di
(d) tc

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Q15. Find the value of m that satisfies (11/10)^7 × (10/11)^(10) × (11/10)^9 = (10/11)^(3m+17)

(a) • 23/3
(b) • 15/3
(c) • 29/3
(d) • 19/3

Q16. 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) URO
(b) TQN
(c) KIE
(d) WTQ

Q17. If 9.8 : 14.7 :: 15 : x, find the value of x.

(a) 22.5
(b) 23.2
(c) 21.7
(d) 19.9

Q18. In triangle ABC, BD ? AC at D and angle DBC = 22°. E is a point on BC such that angle CAE = 36°. What is the measure of angle AEB?

(a) 104°
(b) 103°
(c) 102°
(d) 101°

Q19. Pravenesh starts from point A and drives 12 km towards the south. He then takes a right turn, drives 7 km, turns right and drives 14 km. He then takes a right turn and drives 10 km. He takes a final right turn, drives 2 km and stops at point P. How far (shortest distance) and towards which direction should he drive in order to reach point A again? (All turns are 90 degree turns only unless specified.)

(a) 3 km to the east
(b) 4 km to the east
(c) 2 km to the east
(d) 3 km to the west

Q20. One pipe can fill the tank in 9 minutes while another pipe can empty completely filled tank in 90 minutes. If both the pipes are operated together on empty tank, how long (in minutes) will it take to fill the tank completely?

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

Q21. Which region of the Northern Plains is made of older alluvium?

(a) Terai
(b) . Bhabar
(c) Bhangar
(d) Khadar

Q22. When x is added to each of 20, 34, 11 and 16, then the numbers so obtained, in this order, are in proportion. Then, if 3x : y :: y : (2x-6), and y > 0, what is the value of y?

(a) 18
(b) 2
(c) 10

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(d) 29

Q23. The Abhidhamma Pitaka explores which of the following areas in depth?

(a) Political history
(b) Folk tales
(c) Animal stories
(d) Ethics, mental phenomena, and psychological insights

Q24. Which of the following numbers is divisible by 71?

(a) 6010
(b) 6121
(c) 5603
(d) 5609

Q25. If '−' means '÷', '÷' means '×', '×' means '+' and '+' means '−', then what will come in place of the question mark (?) in the following equation?

9 ÷ 12 × 450 + 8208 − 18 = ?

(a) 101
(b) 102
(c) 100
(d) 425

Q26. Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pair on the left side of :: is the same as that on the right side of ::?

: AIP :: MRV : %

(a) = ELR, % = QUX
(b) = WFN, % = QUX
(c) = IOT, % = WFN
(d) = QUX, % = ELR

Q27. An internal trade route during the post-Mauryan empires, Uttarapatha, connected the:

(a) western and southern parts of India
(b) southern and eastern parts of India
(c) northern and southern parts of India with the northwestern region
(d) northern and eastern parts of India with the northwestern region

Q28. What is the name of the Medium Altitude Long Endurance (MALE) drone discussed at the Drone Industry Conclave 2025?

(a) RUSTOM
(b) TAPAS
(c) NISAR
(d) VARUNA

Q29. How are Municipal Corporations established in the Union Territories of India?

(a) By the Municipal Commissioner
(b) By an Act of Parliament
(c) By State Legislature
(d) By public vote

Q30. 4 is related to 10 following a certain logic. Following the same logic, 34 is related to 40. To which of the following is 66 related, following the same logic? (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.)

(a) 72
(b) 74

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(c) 68
(d) 70

Q31. Find the average of 308, 127, 90, 45, 125 and 103.
(a) 130
(b) 135
(c) 132
(d) 133

Q32. Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pair on the left side of :: is the same as that on the right side of :: ?
: EKN :: RVN : %
(a) = DMK, % = SZQ
(b) = DHL, % = SYP
(c) = CML, % = PZT
(d) = CIK, % = PYR

Q33. Seven boxes, A, B, C, D, E, F and G, are kept one over the other but not necessarily in the same order. C is kept immediately above F. G is kept immediately above B. Only E is kept above D. Only two boxes are kept above C. G is not kept in third position from the bottom. How many boxes are kept above G?
(a) 2
(b) 5
(c) 4
(d) 3

Q34. What is the significance of Westerly Jet Streams in winter?
(a) Cause retreat of monsoon
(b) Influence rainfall in Tamil Nadu
(c) Guide Western Disturbances into India
(d) Bring snowfall to Eastern Ghats

Q35. What should come in place of the question mark (?) in the given series based on the English alphabetical order?
KIO LJP MKQ NLR ?
(a) OMR
(b) OMS
(c) ONS
(d) ONR

Q36. Which functional groups in amino acids are directly involved in forming peptide bonds?
(a) Carbonyl and phosphate groups
(b) Methyl and acetyl groups
(c) Hydroxyl and sulfhydryl groups
(d) Carboxyl and amino groups

Q37. 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 warriors are politicians.
All leaders are knights.
Some knights are warriors.
Conclusions:
(I) Some warriors are leaders.

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(II) Some politicians are knights.

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

Q38. Lok Adalat proceedings are _____.

(a) conciliatory
(b) investigative
(c) adversarial
(d) inquisitorial

Q39. "While covering a distance of 35 km, a man noticed that after cycling for 4 hour 15 minutes, the distance covered by him was 4/3 of the remaining distance. What was his speed (in km/hr, rounded off to one decimal place)?"

(a) 5.1
(b) 4.7
(c) 7.9
(d) 8.4

Q40. The curved surface area of a cylinder is half of its total surface area. If the height is 128 cm, then find the radius (in cm).

(a) 128
(b) 138
(c) 137
(d) 122

Q41. Gaurav bought the first pen for Rs. 444 and the second pen for Rs. 356, respectively. He sells the first pen at 75% of the profit but the buyer bargains for the price, and he has to offer a 14% discount and the second pen at 48% of the profit. Find the total profit he had in this transaction (correct to two decimal places).

(a) Rs. 396.11
(b) Rs. 395.10
(c) Rs. 399.02
(d) Rs. 394.67

Q42. A, B, C, D, G, H, and I are sitting around a circular table facing the centre. Only two people sit between D and A when counted from the left of A. H sits third to the left of G. I sits to the immediate right of G. I sits second to the left of D. B is not an immediate neighbor of H. Who sits third to the right of C?

(a) A
(b) I
(c) D
(d) H

Q43. A river 20 m deep and 36 m wide is flowing at the rate of 2.7 km/hr. The amount of water (in m^3) that runs into the sea per minute is _____.

(a) 30,024
(b) 30,240
(c) 34,200
(d) 32,400

Q44. If Δ ABC ∼ Δ XYZ, AB = 6 cm, XY = 8 cm, YZ = 12 cm and ZX = 16 cm, then find the perimeter of Δ ABC.

(a) 34 cm
(b) 24 cm
(c) 27 cm
(d) 32 cm

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Q45. Manoj starts from Point A and drives 13 km towards west. He then takes a right turn, drives 2 km, turns right and drives 7 km. He then takes a left turn and drives 5 km. He takes a final right turn, drives 6 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again (all turns are 90° turns only unless specified)?

(a) 6 km; South
(b) 7 km; South
(c) 9 km; South
(d) 5 km; South

Q46. Emily Henry's novel about two rival writers competing to pen a biography of a notorious heiress is titled as:

(a) Great Big Beautiful Life
(b) Book Lovers
(c) Happy Place
(d) Funny Story

Q47. What should come in place of the question mark (?) in the given series?

702 700 696 690 682 ?

(a) 670
(b) 672
(c) 688
(d) 671

Q48. Refer to the following number and symbol series and answer the question that follows.

Counting to be done from left to right only. All numbers are single-digit numbers.

(Left) 4 @ 7 4 £ 9 9 # @ 1 4 $ % 4 3 8 2 © © 1 5 # (Right)

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

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

Q49. Jharkhand authorities have successfully relocated Jaigir, the first village inside the _____, entirely outside its core area.

(a) Amangarh Tiger Reserve
(b) Palamu Tiger Reserve
(c) Jim Corbett National Park
(d) Dudhwa Tiger Reserve

Q50. The Poligars rebelled against the British in which Presidency, when the British tried to snatch away their military and land rights?

(a) Madras Presidency
(b) Agra Presidency
(c) Bombay Presidency
(d) Bengal Presidency

Q51. The Konyak tribe of India is mainly found in which of the following states of India?

(a) Uttar Pradesh and Bihar
(b) Nagaland and Arunachal Pradesh
(c) Arunachal Pradesh and Uttar Pradesh
(d) Nagaland and Sikkim

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Q52. What will come in place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

8 ÷ 7 + 56 × 14 − 2 = ?

(a) 54
(b) 52
(c) 56
(d) 58

Q53. In September 2024, the Uniform Code of Pharmaceutical Marketing Practices (UCPMP) 2024 extended its guidelines to which of the following sectors?

(a) Ayurvedic medicines
(b) Online health consultations
(c) Veterinary pharmaceuticals
(d) Medical device manufacturers

Q54. In which year was the Partition of Bengal, initially implemented by the British in 1905, officially annulled?

(a) 1909
(b) 1910
(c) 1916
(d) 1911

Q55. If cot θ = 3/4, then find the value of sin 3θ.

(a) 44/125
(b) 81/125
(c) (-117)/125
(d) 117/125

Q56. Refer to the following number and symbol series and answer the question that follows.

Counting to be done from left to right only. All numbers are single-digit numbers.

(Left) @ 5 4 £ 8 & © £ * 2 5 9 $ 6 £ 4 * 8 $ 4 % * (Right)

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

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

Q57. The power to issue writs for enforcement of Fundamental Rights is vested in the Supreme Court under which Article of the Indian Constitution?

(a) Article 143
(b) Article 32
(c) Article 131
(d) Article 136

Q58. What will come in place of the question mark (?) in the following equation, if '+' and '–' are interchanged, and '×' and '÷' are interchanged?

43 + 15 ÷ 2 – 12 × 4 = ?

(a) 18
(b) 24
(c) 22
(d) 16

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Q59. Who has been appointed as a Principal Secretary-2 to PM Narendra Modi in February 2025?

(a) Rajiv Gauba
(b) Ajay Kumar
(c) Manish Singhal
(d) Shaktikanta Das

Q60. A vendor sold 5 chocolates for Rs. 1, thereby gaining 20%. How many chocolates did he buy for Rs. 1?

(a) 12
(b) 6
(c) 8
(d) 10

Q61. How do you add text to a slide in MS PowerPoint?

(a) Click inside a text placeholder and start typing
(b) Press Ctrl + T
(c) Drag an image onto the slide
(d) Use the Transitions tab

Q62. Which keyboard shortcut permanently deletes a file without sending it to the Recycle Bin in Windows OS?

(a) Alt + Delete
(b) Delete
(c) Ctrl + D
(d) Shift + Delete

Q63. The ratio of the age of a son after 15 years and the present age of his father is 2 : 3. 5 years ago, the age of the father was 4 times the age of the son. The present ages (in years) of the father and the son, respectively, are:

(a) 32:8
(b) 50:20
(c) 45:15
(d) 40:10

Q64. Following are the ages (in years) of 6 people in a group: 25, 30, 35, 40, 45 and 50. What is the standard deviation of their ages (rounded to two decimal places)?

(a) 8.54
(b) 9.26
(c) 7.38
(d) 6.57

Q65. What is the SI unit of energy?

(a) Joule
(b) Watt
(c) Kelvin
(d) Newton

Q66. What is the total full-time strength of personnels in the National Human Rights Commission, India?

(a) Chairperson and five members
(b) Chairperson and four members
(c) Chairperson and seven members
(d) Chairperson and three members

Q67. Which of the following novels was written by Qurratulain Hyder in 1959 and is known for its deep insights on the Partition of India?

(a) Aag Ka Darya
(b) Train to Pakistan
(c) Urvasie

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(d) Pinjar

Q68. P, Q, R, S, T, U and V are sitting around a circular table facing the centre. Both Q and V are immediate neighbours of S. V sits third to the left of T. R sits to the immediate left of T. U is not an immediate neighbour of V. How many people sit between S and U when counted from the right of S?

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

Q69. Which of the following is the largest contributor to irrigation in India?

(a) Sub-irrigation
(b) Tube wells and canals
(c) Rainwater harvesting
(d) Tanks

Q70. X has planned his expenditure as follows: 30% of salary for house rent; 25% for food; 15% for medical expenditure and 16% for others. If he can save Rs. 42,000 every month, then his monthly salary (in Rs.) is:

(a) 3,30,000
(b) 4,20,000
(c) 3,50,000
(d) 3,00,000

Q71. In April 2025, NITI Aayog released a report titled "Automotive Industry – Powering India's Participation in Global Value Chains". What is the primary objective of this report?

(a) To compare India's automotive policies with those of neighbouring countries
(b) To assess the environmental impact of India's automotive sector
(c) To propose strategies for enhancing India's role in global automotive value chains
(d) To analyse India's automotive export performance over the past decade

Q72. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete? GIM 8, HJN 11, IKO 14, JLP 17, ?

(a) UYZ 21
(b) UVY 20
(c) TUY 21
(d) KMQ 20

Q73. Who among the following wrote the book 'Power within: The leadership legacy of Narendra Modi'?

(a) Dr. S Jaishankar
(b) Dr. Aishwarya Pandit
(c) Dr. R Balasubramaniam
(d) Dr. KS Chauhan

Q74. Who won the Sahitya Akademi Award 2024 for Dogri literature for the book 'Ik Hor Ashwthama'?

(a) Padma Sachdev
(b) Chaman Arora
(c) Mohan Singh
(d) Ved Rahi

Q75. In a certain code language,

A + B means ‘A is the mother of B’,

A − B means ‘A is the brother of B’,

A × B means ‘A is the wife of B’ and

A ÷ B means ‘A is the father of B’.

How is M related to Q if ‘M + N − O × P ÷ Q’?

(a) Mother's mother
(b) Father's sister
(c) Mother's sister
(d) Father's mother

Q76. Select the pair that follows the same pattern as that followed by the two sets of pairs given below. Both pairs follow the same pattern.

JAY : MDB

PAN : SDQ

(a) RIC : ULZ
(b) HEN : KHJ
(c) UPC : XSF
(d) KUT : HRW

Q77. In April 2025, which of the following footballers became the first to reach 900 professional career goals including club and country?

(a) Lionel Messi
(b) Cristiano Ronaldo
(c) Robert Lewandowski
(d) Kylian Mbappé

Q78. Select the number from among the given options that can replace the question mark (?) in the following series.

89 103 94 108 99 113 104 ?

(a) 98
(b) 95
(c) 123
(d) 118

Q79. What was the budget allocation for the Ministry of Rural Development for the fiscal year 2023-24?

(a) Rs. 1,59,964 crore
(b) Rs. 1,75,000 crore
(c) Rs. 1,29,000 crore
(d) Rs. 1,50,000 crore

Q80. In March 2025, the Indian Parliament passed the Immigration and Foreigners Bill, 2025. Which of the following Acts was specifically repealed by this legislation?

(a) The Emigration Act, 1983
(b) The Citizenship Act, 1955
(c) The Foreigners Act, 1946
(d) The National Security Act, 1980

Q81. This question is based on the five, three-digit numbers given below.

(Left) 412 366 307 241 667 (Right)

(Example: 697 – First digit = 6, second digit = 9 and third digit = 7)

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

What will be the resultant if the first digit of the highest number is subtracted from the third digit of the lowest number?

(a) -6
(b) -4
(c) -5
(d) -2

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Q82. Mihira Bhoja, a famous ruler of the Pratiharas, adopted which title?

(a) Adivaraha
(b) Vikramaditya
(c) Parmeshwara
(d) Adityavardhana

Q83. If 276 is the mean proportion between x and 368, what is the value of x?

(a) 207
(b) 205
(c) 209
(d) 208

Q84. Pipe A can fill a tank in 9 minutes, while pipe B can empty the completely filled tank in 10 minutes. Initially, pipe A is opened and after 3 minutes pipe B is also opened. In how much time (in minutes) will the remaining tank be filled completely?

(a) 47
(b) 73
(c) 60
(d) 61

Q85. In modern CPUs, what technique is used to execute multiple instructions simultaneously?

(a) Pipelining
(b) Clock Synchronization
(c) Sequential Execution
(d) Serial Processing

Q86. In a certain code language, ‘LIPS’ is coded as ‘4628’ and ‘PURE’ is coded as ‘3567’. What is the code for ‘P’ in the given code language?

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

Q87. In a row of 81 students facing north, Sima is 12^(th)from the right end. If Manju is 9th to the left of Sima, what is Manju’s position from the left end of the line?

(a) 61^(st)
(b) 52^(nd)
(c) 38^(th)
(d) 47^(th)

Q88. At what rate of interest (in percentage) per year will a sum of money double itself in 4 years on simple interest?

(a) 23%
(b) 50%
(c) 25%
(d) 27%

Q89. Which Article of the Constitution of India allowed citizens to reside and settle in any part of the territory of India?

(a) Article 19
(b) Article 15
(c) Article 18
(d) Article 22

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Q90. Simplify $(8x^3 + 27y^3 - 64z^3 + 72xyz)/(4x^2 + 9y^2 + 16z^2 - 6xy + 12yz + 8zx)$

(a) (2x + 3y - 4z)
(b) (2x - 3y - 4z)
(c) (2x - 3y + 4z)
(d) (2x + 3y + 4z)

Q91. The Eastern Coastal Plains of India are best described as which type of coast?

(a) Emergent coast
(b) Submerged coast
(c) Folded coast
(d) Rocky coast

Q92. XC 14 is related to VG 1 in a certain way. In the same way, RD 18 is related to PH 5. To which of the given options is UP 4 related, following the same logic?

(a) VR -7
(b) ST -9
(c) NR -7
(d) NE -9

Q93. An article was bought for Rs. 8,100. Its price was marked up by 40%. Thereafter it was sold at a discount of 15% on the marked price. What was the percentage profit on the transaction?

(a) 20%
(b) 18%
(c) 19%
(d) 17%

Q94. What was the labour force participation rate for males in India as reported in the 6^(th)Annual Employment-Unemployment Survey conducted by the Labour Bureau?

(a) 80.2%
(b) 76.4%
(c) 85.4%
(d) 70.1%

Q95. What will be the amount after 1 year if Rs. 9,900 is invested at 20% compound interest per annum, compounded half-yearly?

(a) Rs. 12,495
(b) Rs. 11,307
(c) Rs. 11,979
(d) Rs. 12,940

Q96. In a certain code language, ‘PICK’ is coded as ‘4628’ and ‘COST’ is coded as ‘3567’. What is the code for ‘C’ in the given code language?

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

Q97. If 2 is added to each even digit and 1 is subtracted from each odd digit in the number 415796, what will be the sum of the digits which are fifth from the left and first from the right in the new number thus formed?

(a) 12
(b) 16
(c) 14
(d) 10

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Q98. According to the 6^(th) Annual Employment-Unemployment Survey conducted by the Labour Bureau, which age group had the highest participation in the labour force in India?

(a) 18-24
(b) 15-18
(c) 30 years and above
(d) 25-29

Q99. If the ratio of two numbers is 17 : 7 and the product of their LCM and their HCF is 119, then the sum of the reciprocals of the LCM and the HCF is:

(a) 120/139
(b) 120/137
(c) 120/119
(d) 120/161

Q100. Based on the English alphabetical order, three of the following four letter-cluster pairsare 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) NR - MQ
(b) EI - DH
(c) XZ - TL
(d) RV - QU

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) Inconsistent use of slide masters and templates

The correct answer is Inconsistent use of slide masters and templates.

Key Points

• Inconsistent use of slide masters and templates can lead to a lack of uniformity in design, making the presentation appear unprofessional and reducing its credibility.

• Proper use of slide masters ensures consistent formatting, including font styles, colors, and layouts throughout the presentation.

• Templates provide a structured and visually appealing design, contributing to the clarity and impact of the presentation.

• Disorganized or conflicting slide designs may distract the audience, undermining the content's effectiveness and overall message delivery.

• Maintaining design consistency aligns with best practices for creating high-quality presentations that convey professionalism and attention to detail.

Additional Information

• Slide Masters:

• Slide masters are pre-designed layouts that control the appearance of slides in a presentation.

• Using slide masters ensures uniformity in font styles, colors, and layout across multiple slides.
• They save time by allowing users to apply consistent formatting without manually editing each slide.
• Templates:
• Templates are pre-designed slide decks that provide a cohesive visual structure.
• They allow users to focus on content creation rather than design elements.
• Templates are especially useful for maintaining brand identity in corporate presentations.
• Best Practices for PowerPoint Presentations:
• Limit the use of animations and transitions to avoid distracting the audience.
• Ensure text is legible by using appropriate font sizes and contrasting colors.
• Include visuals like charts and images to complement the content and aid understanding.
• Proofread content thoroughly to avoid grammatical errors or inconsistencies.
• Impact of Poor Design:
• Poor design choices can divert attention from the presentation's core message.
• It may result in disengagement from the audience and a loss of credibility.
• Professionally designed presentations foster trust and enhance the speaker's authority.

Q2. Answer: (a) 4

Given:

72 ÷ [4/2 × {9 + 2 - (4 + 7 - (1 + 8))}]

Formula used:

Follow BODMAS: Brackets → Orders → Division → Multiplication → Addition → Subtraction

Calculation:

72 ÷ [4/2 × {9 + 2 - (4 + 7 - (1 + 8))}]

=> (72 ÷ [2 × {9 + 2 - (4 + 7 - 9)}])

=> (72 ÷ [2 × {9 + 2 - (11 - 9)}])

=> (72 ÷ [2 × {9 + 2 - 2}])

=> (72 ÷ [2 × 9])

=> (72 ÷ 18)

=> 4

Therefore The correct answer is 4.

Q3. Answer: (d) 1818

The correct answer is 1818.

Key Points

• The Bhil rebellion, led by prominent leaders such as Kazi Singh and Bhima Naik, started in 1818.
• This tribal uprising occurred in the regions of Khandesh, which is now part of modern-day Maharashtra and Madhya Pradesh.
• The Bhils revolted against British colonial rule due to exploitation, loss of autonomy, and oppressive revenue policies.
• The rebellion was fueled by the marginalization of the Bhil community and the British seizure of their traditional lands and forests.
• Despite being tribal guerrilla fighters, the Bhils faced significant challenges in sustaining the rebellion against the superior British forces.

Additional Information

• Bhil Community:
• The Bhils are one of the largest tribal communities in India, primarily inhabiting the western and central parts of the country.
• Traditionally, they relied on agriculture, hunting, and forest resources for sustenance.
• Their distinct cultural identity includes traditional attire, unique art forms, and tribal governance systems.
• Causes of Tribal Rebellions:
• The British colonial policies often disrupted tribal autonomy and traditional ways of life.
• Exploitation by landlords, moneylenders, and revenue officials further aggravated tribal discontent.
• Forced labor and displacement from ancestral lands were recurring issues for tribal communities.
• Impact of the Bhil Rebellion:
• Although the rebellion was eventually suppressed, it highlighted the resilience and resistance of the Bhil community.
• The British implemented certain conciliatory measures, such as appointing Bhil leaders in administrative roles, to pacify the community.

• Other Tribal Movements:

• The Bhil rebellion was one of many tribal uprisings during British rule, such as the Santhal rebellion (1855-1856) and the Munda rebellion (1899-1900).

• These movements were significant in shaping India's freedom struggle by exposing the exploitative colonial practices.

Q4. Answer: (c) 55.56

Shortcut Trick

90% of Tank Capacity = 50 litres

10% of Tank Capacity (Remaining) = (50 ÷ 90) × 10 litres

=> 50 ÷ 9 = 5.555... litres

Total petrol needed to fill = 50 + 5.555... = 55.56 litres

Therefore The correct answer is 55.56 litres.

Alternate Method

Given:

Petrol poured = 50 litres

Empty percentage = 10%

Filled percentage = 100% − 10% = 90%

=> Let the total capacity of the tank be x litres.

=> 90% of x = 50

=> (90/100) × x = 50

=> x = (50 × 100) ÷ 90

=> x = 500 ÷ 9 = 55.555... litres

=> Rounded to two decimal places, x ≈ 55.56 litres

Therefore The correct answer is 55.56 litres.

Additional Information

Percentage Change

Percentage change = (Difference ÷ Original Value) × 100. Useful for calculating capacity fluctuations.

Base Value Concept

Always identify the 100% value (total capacity) before calculating parts (filled or empty portions).

Rounding Rules

If the third decimal digit is 5 or more, increase the second decimal digit by 1 (e.g., 5.555... becomes 5.56).

Q5. Answer: (d) 84

Given: Suraj ranked 18th from the top and 67th from the bottom in his class.

Suraj's rank from the top = 18th

Suraj's rank from the bottom = 67th

Total number of students in his class = Suraj's rank from the top + Suraj's rank from the bottom - 1

= 18 + 67 - 1

= 84

Hence, "Option 4" is the correct answer.

Q6. Answer: (d) 19%

The correct answer is 0.19.

Key Points

• According to the Global Debt Report 2025, the share of central bank holdings of domestic sovereign bonds in OECD countries in 2024 was 19% (0.19).

• OECD countries represent economically advanced nations, including key players such as the US, UK, Japan, and European Union member states.

• The significant holding of domestic sovereign bonds by central banks highlights their role in stabilizing economies and managing fiscal policies.

• The increase in central bank holdings has been influenced by quantitative easing policies implemented during economic downturns.

• This share underscores the growing reliance on central banks to provide liquidity and maintain economic stability.

Additional Information

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• OECD (Organisation for Economic Co-operation and Development):
• An intergovernmental organization established in 1961 to promote economic progress and global trade.
• It consists of 38 member countries, mostly developed economies.
• OECD provides a platform for economic analysis and policy recommendations.
• Domestic Sovereign Bonds:
• Sovereign bonds are debt securities issued by governments to finance their expenditures.
• Domestic sovereign bonds are denominated in the issuing country's local currency.
• Central banks often purchase these bonds as part of monetary policy measures.
• Quantitative Easing (QE):
• A monetary policy tool used by central banks to inject liquidity into the economy.
• Involves large-scale purchases of government bonds and other securities.
• Aimed at reducing interest rates and stimulating economic growth.
• Economic Stability and Liquidity Management:
• Central banks play a key role in maintaining economic stability by controlling inflation and managing liquidity.
• Purchasing sovereign bonds is one method to ensure adequate liquidity in financial markets.

Q7. Answer: (c) Lorenz Curve

The correct answer is Lorenz Curve.

Key Points

• The Lorenz Curve is a graphical representation that illustrates the distribution of income or wealth among individuals or households in a population.
• It is used to measure income inequality, where the degree of deviation from the line of perfect equality (the diagonal line) indicates the level of inequality.
• The closer the Lorenz Curve is to the diagonal line, the more equal the income distribution; the farther it is, the greater the inequality.
• The curve is often used in conjunction with the Gini Coefficient, which quantifies the level of income inequality as a single numerical value.
• Developed by Max Lorenz in 1905, this tool remains a cornerstone in economic studies related to inequality and social welfare.

Additional Information

• Gini Coefficient:
• The Gini Coefficient is a numerical measure derived from the Lorenz Curve, ranging from 0 to 1.
• A Gini Coefficient of 0 indicates perfect equality, while a value of 1 indicates perfect inequality.
• It is widely used by economists and policymakers to compare income inequality across regions or countries.
• Dependency Ratio:
• This is a demographic metric that indicates the ratio of dependents (young and elderly) to the working-age population.
• While important for understanding economic pressures, it does not measure income inequality.
• Consumer Price Index (CPI):
• CPI measures changes in the price level of a basket of consumer goods and services purchased by households over time.
• It is a key indicator of inflation, not income distribution.
• Labour Force Participation Rate (LFPR):
• LFPR measures the proportion of the working-age population that is either employed or actively seeking employment.
• It provides insights into labor market dynamics but does not reflect income inequality.
• Historical Context of Income Inequality Studies:
• The study of income inequality gained prominence during the 20th century as economists sought to understand its implications on economic growth and social stability.
• Tools like the Lorenz Curve and Gini Coefficient remain fundamental to these analyses.

Q8. Answer: (b) Common ion effect

The correct answer is Common Ion Effect.

Key Points

• Common ion effect occurs when a solution already contains ions that are present in the solute being added, reducing the solubility of the solute due to ion interference.
• In the case of CH3COOH, the addition of CH3COONa introduces acetate ions (CH3COO^-), which are common to both the acid

and the salt.

• The presence of acetate ions shifts the dissociation equilibrium of CH3COOH to the left, decreasing the concentration of hydrogen ions and reducing its solubility.

• This phenomenon is explained by Le Chatelier's Principle, where the equilibrium adjusts to counter the increase in concentration of common ions.

• The common ion effect is a key concept in acid-base chemistry, particularly in buffer solutions and solubility equilibria.

Additional Information

• Le Chatelier's Principle:

• This principle states that if a dynamic equilibrium is disturbed by changing conditions, the position of equilibrium shifts to counteract the change.

• In the case of the common ion effect, the equilibrium adjusts to reduce the concentration of the added common ion.

• Buffer Solutions:

• Buffers are solutions that resist changes in pH upon the addition of small amounts of acid or base.

• The common ion effect plays a crucial role in maintaining the pH stability of buffers.

• Applications of Common Ion Effect:

• Used in analytical chemistry for selective precipitation of ions.

• Helps in controlling the solubility of compounds in pharmaceutical formulations.

• Important in maintaining pH stability in biological systems.

• Solubility Equilibrium:

• Describes the balance between dissolved ions and undissolved solid in a saturated solution.

• The common ion effect influences solubility equilibrium by altering the ionic concentrations.

Q9. Answer: (b) Ctrl + S

The correct answer is Ctrl + S.

Key Points

• Ctrl + S is the standard keyboard shortcut used in MS Excel, as well as most other software, to save the current file or workbook.

• When pressed, this shortcut ensures that the changes made to the workbook are stored in the file on the disk, preventing data loss.

• If the file is being saved for the first time, the "Save As" dialog box will appear to allow the user to specify the file name and location.

• This shortcut is part of the universally accepted Microsoft Office commands, ensuring consistency across various Office applications like Word, PowerPoint, and Excel.

• Using shortcuts like Ctrl + S improves productivity and minimizes the risk of losing unsaved work due to unexpected interruptions.

Additional Information

• Other Common Keyboard Shortcuts in MS Excel:

• Ctrl + N: Creates a new workbook.

• Ctrl + O: Opens an existing workbook.

• Ctrl + P: Opens the print dialog box for printing the workbook.

• Ctrl + Z: Undoes the last action.

• Ctrl + Y: Redoes the last undone action.

• AutoSave Feature:

• Microsoft Excel's AutoSave feature automatically saves changes to the workbook at regular intervals (if enabled).

• It is particularly useful when working on cloud-based platforms like OneDrive.

• Save As Command:

• Accessible via F12 or the File menu, this command allows users to save the file with a different name or in a different format.

• It is commonly used when creating multiple versions of a file.

• File Formats in MS Excel:

• Excel files can be saved in various formats, including .xlsx (default), .xls (Excel 97-2003), .csv (comma-separated values), and .pdf.

• Choosing the correct format is essential for compatibility and specific use cases.

• Importance of Regular Saving:

• Regularly saving your work ensures protection against unexpected system crashes, power outages, or accidental file closures.

• Experts recommend using Ctrl + S frequently during long working sessions to minimize data loss risks.

Q10. Answer: (d) 74.85

Shortcut Trick

Apply the Empirical Formula: Mean = (3 × Median − Mode) ÷ 2.

Mean = (3 × 62 − 36.3) ÷ 2

Mean = (186 − 36.3) ÷ 2

Mean = 149.7 ÷ 2 = 74.85

Therefore The correct answer is 74.85.

Alternate Method

Given: Mode = 36.3 and Median = 62.

Formula Used: Mode = 3 × Median − 2 × Mean

=> 36.3 = 3 × 62 − 2 × Mean

=> 36.3 = 186 − 2 × Mean

=> 2 × Mean = 186 − 36.3

=> 2 × Mean = 149.7

=> Mean = 149.7 ÷ 2

=> Mean = 74.85

Therefore The correct answer is 74.85.

Additional Information

Empirical Relationship

For a moderately skewed distribution, the relationship between central tendencies is Mode = 3 Median − 2 Mean.

Symmetrical Distribution

In a perfectly symmetrical distribution (like a Normal Distribution), the Mean, Median, and Mode coincide at the same point (Mean = Median = Mode).

Skewness and Central Tendency

In a positively skewed distribution, Mean > Median > Mode. In a negatively skewed distribution, Mode > Median > Mean.

Q11. Answer: (b) 26

Shortcut Trick

For two people running in opposite directions on a circular track, the number of meeting points is the sum of the simplified ratio of their speeds.

Ratio of time taken by Siddharth and Yash = 85 : 45

Ratio of speed of Siddharth and Yash = 45 : 85 = 9 : 17

Number of distinct meeting points = 9 + 17 = 26

Therefore The correct answer is 26.

Alternate Method

Given:

Length of circular track = 2295 m

Time taken by Siddharth (T1) = 85 s

Time taken by Yash (T2) = 45 s

Calculations:

=> Speed of Siddharth (S1) = Distance ÷ T1 = 2295 ÷ 85 = 27 m/s

=> Speed of Yash (S2) = Distance ÷ T2 = 2295 ÷ 45 = 51 m/s

=> Ratio of Speeds (S1 : S2) = 27 : 51

=> Simplify the ratio by dividing by 3: 27/3 : 51/3 = 9 : 17

=> Let the simplified ratio be a : b, where a = 9 and b = 17.

=> Since they move in opposite directions, total meeting points = a + b

=> Meeting points = 9 + 17 = 26

Therefore The correct answer is 26.

Additional Information

Meeting Points in Same Direction

If two people move in the same direction with speeds in simplified ratio a : b (where a > b), the number of distinct meeting points is

|a − b|.

Time of First Meeting

The time taken for the first meeting anywhere on the track is L ÷ (S1 + S2) for opposite directions and L ÷ |S1 − S2| for same direction, where L is track length.

Time of Meeting at Start Point

The time when they meet for the first time at the starting point is given by LCM of the time taken by each person to complete one full round.

Q12. Answer: (b) 2, (-19)/4

Shortcut Trick

For a cubic equation $ax^3 + bx^2 + cx + d = 0$, the sum and product of roots are given by:

Sum of roots = −b/a and Product of roots = −d/a.

In the given equation $4x^3 − 8x^2 − 13x + 19 = 0$, we have a = 4, b = −8, and d = 19.

Sum = −(−8)/4 = 2 and Product = −19/4.

Therefore The correct answer is 2, −19/4.

Alternate Method

Given:

Cubic Equation: $4x^3 − 8x^2 − 13x + 19 = 0$

Formula Used:

For $ax^3 + bx^2 + cx + d = 0$:

Sum of roots (α + β + γ) = − (coefficient of x^2) / (coefficient of x^3)

Product of roots (αβγ) = − (constant term) / (coefficient of x^3)

Calculations:

=> Comparing with standard form, a = 4, b = −8, c = −13, d = 19

=> Sum of all roots = −b/a = −(−8)/4

=> Sum of all roots = 8/4 = 2

=> Product of all roots = −d/a = −(19)/4

=> Product of all roots = −19/4

Therefore The correct answer is 2, −19/4.

Additional Information

Sum of roots taken two at a time

For a cubic equation, the sum of product of roots taken two at a time (αβ + βγ + γα) is equal to c/a.

Quadratic Equation Roots

For a quadratic equation $ax^2 + bx + c = 0$, the sum of roots is −b/a and the product of roots is c/a.

Vieta's Formulas

These formulas relate the coefficients of a polynomial to sums and products of its roots, where signs alternate (+, −, +, −...).

Q13. Answer: (b) 60

Shortcut Trick

If all subgroups in a population have the same average value, the combined average of the entire population will remain the same, regardless of the number of items in each subgroup.

Average of 12 students = 60

Average of the rest (18 students) = 60

Since both groups have an average of 60, the total class average is simply 60.

Therefore The correct answer is 60.

Alternate Method

Given:

Total students in the class = 30

Average score of 12 students = 60

Average score of the remaining students = 60

Formula Used:

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

Calculations:

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=> Total score of 12 students = 12 × 60 = 720

=> Remaining students = 30 − 12 = 18

=> Total score of 18 students = 18 × 60 = 1080

=> Total score of the class = 720 + 1080 = 1800

=> Average score of the class = 1800 ÷ 30

=> Average score of the class = 60

Therefore The correct answer is 60.

Additional Information

Weighted Average Formula

When two groups are combined, the resulting average is A_(avg) = (n1×A1 + n2×A2) ÷ (n1 + n2), where n is the count and A is the average.

Constant Average Property

If every individual in a group has the same value 'x', the average of the group is always 'x'. Adding more groups with average 'x' will not change the overall average.

Deviation Principle

The sum of deviations of all observations from their arithmetic mean is always zero. This helps in finding the average of large datasets by assuming a base value.

Q14. Answer: (d) tc

According to the given information,

Thus, 'flag' is coded as 'tc'.

Hence, "Option 4" is the correct answer.

Q15. Answer: (a) • 23/3

Given:

(11/10)^7 × (10/11)^(10) × (11/10)^9 = (10/11)^(3m+17)

Formula used:

a^m × aⁿ = a^(m+n) and (a/b)ⁿ = (b/a)^(-n)

Calculation:

Combine powers of same base:

(11/10)^7 × (11/10)^9 = (11/10)^(16)

Now the expression becomes:

(11/10)^(16) × (10/11)^(10)

Write everything in base (10/11) :

(11/10)^(16) = (10/11)^(-16)

So the full expression becomes:

(10/11)^(-16) × (10/11)^(10) = (10/11)^(-6)

Now equating powers:

-6 = 3m + 17

=> 3m = -6 - 17 = -23

=> m = (-23)/3

Therefore The correct answer is -23/3

Q16. Answer: (c) KIE

The logic followed here is:

Option 1) URO

Option 2) TQN

Option 3) KIE

Option 4) WTQ

Thus, out of all the options 'KIE' is the odd one.

Hence, "Option 3" is the correct answer.

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Q17. Answer: (a) 22.5

Shortcut Trick

In a proportion a : b :: c : d, the Product of Extremes equals the Product of Means.

Ratio of 9.8 : 14.7 simplified is 2 : 3 (both divisible by 4.9).

Since the first ratio is 2 : 3, the second ratio 15 : x must also be 2 : 3.

2 units → 15, so 1 unit → 7.5. Therefore, 3 units → 3 × 7.5 = 22.5.

Therefore The correct answer is 22.5.

Alternate Method

Given Proportion: 9.8 : 14.7 :: 15 : x

Formula used: Product of extremes = Product of means (a × d = b × c)

=> 9.8 × x = 14.7 × 15

=> x = (14.7 × 15) ÷ 9.8

=> x = 220.5 ÷ 9.8

=> x = 22.5

Therefore The correct answer is 22.5.

Additional Information

Fourth Proportional

In the expression a : b :: c : d, d is called the fourth proportional to a, b, and c. It is calculated as d = (b × c) ÷ a.

Mean Proportional

The mean proportional between two numbers a and b is √(a × b). It satisfies the ratio a : x :: x : b.

Third Proportional

If a : b :: b : c, then c is called the third proportional to a and b, calculated as c = b^2 ÷ a.

Q18. Answer: (a) 104°

Shortcut Trick

In ΔBDC, since BD perpendicular to AC, angle C = 90° − angle DBC = 90° − 22° = 68°.

In ΔAEC, angle AEB is the exterior angle at vertex E because B, E, C are collinear.

By the Exterior Angle Theorem, angle AEB = angle CAE + angle C.

=> angle AEB = 36° + 68° = 104°.

Therefore The correct answer is 104°.

Alternate Method

Given: In ΔABC, BD perpendicular to AC at D, angle DBC = 22°, and angle CAE = 36° where E is on BC.

Formula Used: Sum of angles in a triangle = 180°; Linear pair of angles sum to 180°.

In ΔBDC:

=> angle BDC = 90° (Since BD perpendicular to AC)

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

=> angle BCD + 22° + 90° = 180°

=> angle BCD = 180° − 112° = 68°

In ΔAEC:

=> angle CAE = 36° (Given)

=> angle ACE = angle BCD = 68°

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

=> angle AEC = 180° − (36° + 68°) = 180° − 104° = 76°

Since B, E, C lie on a straight line:

=> angle AEB + angle AEC = 180° (Linear pair)

=> angle AEB = 180° − 76° = 104°

Therefore The correct answer is 104°.

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.

Angle Sum Property

The sum of the interior angles of any triangle is always 180°.

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Linear Pair Postulate

If two angles form a linear pair, then the measures of the angles add up to 180°.

Q19. Answer: (d) 3 km to the west

Given:

Pravenesh starts from point A and drives 12 km towards the south.

He then takes a right turn, drives 7 km, turns right and drives 14 km.

He then takes a right turn and drives 10 km.

He takes a final right turn, drives 2 km and stops at point P.

Thus, Pravenesh should drive 3 km (10 km - 7 km) in the west direction in order to reach point A again.

Hence, "Option 4" is the correct answer.

Q20. Answer: (d) 10

Shortcut Trick

Net filling time = (a × b) ÷ (b − a), where a is filling time and b is emptying time.

Net time = (9 × 90) ÷ (90 − 9)

Net time = 810 ÷ 81 = 10 minutes.

Therefore The correct answer is 10 minutes.

Alternate Method

Pipe Type	Time (min)	Total Work (LCM)	Efficiency
Filling Pipe	9	90 units	+10
Emptying Pipe	90	−1	

=> Combined Efficiency = 10 − 1 = 9 units/minute.

=> Time taken to fill tank = Total Work ÷ Combined Efficiency

=> Time = 90 ÷ 9 = 10 minutes.

Therefore The correct answer is 10 minutes.

Additional Information

Pipes and Cisterns Efficiency

Efficiency of a filling pipe is taken as positive (+), while the efficiency of an emptying pipe (leak) is taken as negative (−).

Net Work Formula

If pipe A fills in x hours and pipe B empties in y hours, the net work in 1 hour is (1/x − 1/y). If the result is positive, the tank is filling; if negative, the tank is emptying.

Q21. Answer: (c) Bhangar

The correct answer is Bhangar.

Key Points

• Bhangar is the older alluvium found in the Northern Plains of India.

• It is characterized by its slightly elevated terraces compared to the newer alluvium, known as Khadar.

• The soil in the Bhangar region is generally less fertile due to the presence of lime nodules, locally called kankar.

• This region is usually found farther away from river courses and is more stable as compared to the younger Khadar regions.

• Bhangar plays a crucial role in agriculture but often requires more effort to improve soil fertility compared to Khadar.

Additional Information

• Khadar: The newer alluvium deposited by rivers during floods, forming fertile plains ideal for agriculture.

• Bhabar: A narrow belt of coarse gravel and pebbles situated at the foothills of the Himalayas, where rivers disappear due to high porosity.

• Terai: A marshy region located south of the Bhabar belt, where rivers re-emerge, supporting dense vegetation and rich biodiversity.

• Alluvium: Sediments deposited by rivers, categorized into older (Bhangar) and newer (Khadar) based on their time of deposition and fertility.

• The Northern Plains of India are formed by the deposition of sediments brought by the Ganga, Brahmaputra, and Indus river systems.

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Q22. Answer: (a) 18

Shortcut Trick

To find x for proportion (a, b, c, d): x = (ad − bc) ÷ (b + c − a − d)

x = (20 × 16 − 34 × 11) ÷ (34 + 11 − 20 − 16) = (320 − 374) ÷ (45 − 36) = −54 ÷ 9 = −6

Substitute x = −6 in 3x : y :: y : (2x − 6) => y2 = 3x(2x − 6) = 3(−6)(2(−6) − 6) = −18 × −18 = 324

y = √324 = 18 (since y > 0)

Therefore The correct answer is 18.

Alternate Method

Given: Numbers (20+x), (34+x), (11+x), (16+x) are in proportion.

Formula Used: a/b = c/d and y2 = ac if a : y :: y : c

=> (20 + x) ÷ (34 + x) = (11 + x) ÷ (16 + x)

=> (20 + x)(16 + x) = (11 + x)(34 + x)

=> 320 + 20x + 16x + x2 = 374 + 11x + 34x + x2

=> 320 + 36x = 374 + 45x

=> 45x − 36x = 320 − 374

=> 9x = −54 => x = −6

=> Now, 3x : y :: y : (2x − 6)

=> y2 = 3x × (2x − 6)

=> y2 = 3(−6) × (2(−6) − 6) = −18 × (−12 − 6) = −18 × −18

=> y2 = 324 => y = √324 = 18

Therefore The correct answer is 18.

Additional Information

Mean Proportional

If b is the mean proportional between a and c, then a : b :: b : c, which implies b2 = ac.

Basic Proportion Rule

Four numbers a, b, c, d are in proportion if a × d = b × c (Product of extremes = Product of means).

Third Proportional

In the proportion a : b :: b : c, the term c is called the third proportional to a and b, where c = b2/a.

Q23. Answer: (d) Ethics, mental phenomena, and psychological insights

The correct answer is Ethics, mental phenomena, and psychological insights.

Key Points

• The Abhidhamma Pitaka is one of the three sections of the Tripitaka, the foundational texts of Theravāda Buddhism.

• It focuses on philosophical and psychological analysis of the mind, mental phenomena, and ethical principles.

• It provides a detailed categorization of mental states, cognitive processes, and ethical behavior.

• Unlike the Sutta Pitaka, which contains discourses, the Abhidhamma Pitaka offers a more systematic and analytical approach to Buddhist teachings.

• It is considered a scholarly and advanced text, aimed primarily at monks and serious students of Buddhist philosophy.

Additional Information

• Tripitaka (Three Baskets):

• The Tripitaka consists of three main collections: Vinaya Pitaka (rules for monastic discipline), Sutta Pitaka (Buddha's discourses), and Abhidhamma Pitaka (philosophical and psychological analysis).

• It forms the doctrinal foundation of Theravāda Buddhism and is written in Pali.

• Abhidhamma Pitaka Structure:

• Contains seven books, such as Dhammasangani, Vibhanga, and Patthana, which systematically explore mental and physical phenomena.

• Focuses on understanding reality through an analysis of consciousness, perception, and causality.

• Role in Buddhist Practice:

• The Abhidhamma Pitaka helps practitioners cultivate insight (vipassana) into the nature of reality and achieve liberation (nirvana).

• It is used as a guide for meditation and ethical living, emphasizing mindfulness and understanding of mental states.

• Psychological Insights:

• Offers a detailed examination of the mind, emotions, and thought processes, making it highly relevant in modern psychological studies.

• Its teachings on impermanence (anicca), suffering (dukkha), and non-self (anatta) are central to Buddhist philosophy.

Q24. Answer: (d) 5609

Shortcut Trick

To check divisibility by 71, use the oscillator method where the osculator for 71 is 7.

Multiply the last digit by 7 and subtract it from the remaining number.

For 5609: 560 − (9 × 7) = 560 − 63 = 497.

Repeat: 49 − (7 × 7) = 49 − 49 = 0. Since the result is 0, the number is divisible.

Therefore The correct answer is 5609.

Alternate Method

Given: Numbers (1) 6010, (2) 6121, (3) 5603, (4) 5609 and divisor 71.

Calculation:

=> Check 6010: 6010 ÷ 71 ≈ 84.64 (Not divisible)

=> Check 6121: 6121 ÷ 71 ≈ 86.21 (Not divisible)

=> Check 5603: 5603 ÷ 71 ≈ 78.91 (Not divisible)

=> Check 5609: 5609 ÷ 71 = 79

=> 71 × 70 = 4970

=> 5609 − 4970 = 639

=> 71 × 9 = 639

=> 4970 + 639 = 5609

Therefore The correct answer is 5609.

Additional Information

Negative Osculators

For a prime number ending in 1 like 71, the negative osculator is (71−1)/10 = 7. Subtract (last digit × 7) from the rest of the number.

Divisibility by Prime Numbers

Divisibility for any prime p can be checked using the formula 10k ± 1 to find the osculator value used for reducing large numbers.

Q25. Answer: (b) 102

Decoding signs:

Sign	−	÷	×	•
Stands For	÷	×	•	−

Given: 9 ÷ 12 × 450 + 8208 − 18 = ?

9 ÷ 12 × 450 + 8208 − 18 = ? => 9 × 12 + 450 − 8208 ÷ 18 = ?

=> 9 × 12 + 450 − 8208 ÷ 18 = ?

=> 9 × 12 + 450 − 456 = ?

=> 108 + 450 − 456 = ?

=> 558 − 456 = ?

=> 102 = ?

Hence, "Option 2" is the correct answer.

Q26. Answer: (b) = WFN, % = QUX

The logic followed here is:

Given: # : AIP :: MRV : %

Option 1) # = ELR, % = QUX → ELR : AIP :: MRV : QUX

Option 2) # = WFN, % = QUX → WFN : AIP :: MRV : QUX

Option 3) # = IOT, % = WFN → IOT : AIP :: MRV : WFN

Option 4) # = QUX, % = ELR → QUX : AIP :: MRV : ELR

Hence, "Option 2" is the correct answer.

Q27. Answer: (d) northern and eastern parts of India with the northwestern region

The correct answer is northern and eastern parts of India with the northwestern region.

Key Points

• Uttarapatha was one of the most important trade routes in ancient India, especially during the post-Mauryan period.

• It connected the northern and eastern regions of India with the northwestern region, facilitating trade and cultural exchanges.

• This route extended from the Gangetic plains to the northwestern regions, including Taxila and regions in present-day Pakistan.

• Uttarapatha was a crucial trade corridor for goods like textiles, spices, and precious metals.

• It also played a role in the spread of Buddhism and other cultural influences along its path during the post-Mauryan period.

Additional Information

• Other Major Ancient Trade Routes:

• Dakshinapatha: Connected the southern regions of India to the northern parts.

• Silk Route: Facilitated trade between India, Central Asia, and China, primarily for silk, spices, and precious stones.

• Grand Trunk Road: An important ancient route later developed into a major highway during the Mughal period.

• Taxila's Role:

• Taxila, located near Uttarapatha, was a major center for trade and learning during ancient times.

• It served as a hub for merchants traveling along Uttarapatha.

• Post-Mauryan Period:

• The post-Mauryan period saw significant trade activity along Uttarapatha under rulers like the Shungas, Kushans, and Satavahanas.

• It was during this period that Indian merchants actively engaged in international trade.

• Buddhism's Spread:

• Uttarapatha played a role in the spread of Buddhism to Central Asia and beyond.

• Buddhist monks often traveled along this route to propagate teachings.

Q28. Answer: (b) TAPAS

The correct answer is TAPAS.

Key Points

• TAPAS is a Medium Altitude Long Endurance (MALE) unmanned aerial vehicle (UAV) developed by the Defence Research and Development Organisation (DRDO) in India.

• The UAV is designed for surveillance, reconnaissance, and intelligence gathering over extended periods.

• TAPAS was showcased at the Drone Industry Conclave 2025 as a significant step towards India's self-reliance in drone technology.

• It can operate at altitudes of up to 30,000 feet and has an endurance of over 24 hours, making it suitable for both military and civilian applications.

• The drone integrates advanced systems such as electro-optical payloads, synthetic aperture radar, and satellite communication capabilities.

Additional Information

• Medium Altitude Long Endurance (MALE) UAVs

• MALE UAVs are designed to operate at altitudes ranging from 10,000 to 30,000 feet.

• These drones are capable of long-duration flights, often exceeding 24 hours, making them ideal for extended missions.

• They are widely used for surveillance, reconnaissance, and intelligence gathering, particularly in defense and border monitoring.

• DRDO's Role in UAV Development

• The Defence Research and Development Organisation (DRDO) is India's premier research agency focused on defense technology.

• It has developed several UAVs, including TAPAS, RUSTOM, and NETRA, to strengthen India's indigenous drone capabilities.

• DRDO collaborates with other agencies and private industries to integrate cutting-edge technologies into its UAV projects.

• Applications of TAPAS

• Military: Border surveillance, anti-terror operations, and intelligence gathering.

• Civilian: Disaster management, agriculture monitoring, and search-and-rescue operations.

• Scientific: Environmental data collection and weather monitoring.

• Other UAVs Developed by DRDO

• RUSTOM: Another MALE UAV designed for tactical missions and surveillance.

• NETRA: A small quadcopter UAV used for surveillance in urban areas.

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• AURA: An autonomous stealth UAV under development for advanced military applications.

Q29. Answer: (b) By an Act of Parliament

The correct answer is By an Act of Parliament.

Key Points

• Municipal Corporations in Union Territories (UTs) are established through Acts passed by the Parliament of India, as UTs are governed directly by the Central Government.

• Unlike states, which have their own legislative assemblies, Union Territories are administered by the President of India through appointed administrators.

• The Parliament enacts laws to create and regulate municipal corporations in UTs, ensuring they fulfill the functions of urban local governance.

• For example, the New Delhi Municipal Council (NDMC) operates under the New Delhi Municipal Council Act, 1994, passed by Parliament.

• This framework ensures consistency and uniformity in governance across UTs, considering their unique administrative structures.

Additional Information

• Municipal Corporation:

• It is a form of urban local government that governs cities with a population exceeding 1 million.

• Municipal corporations are responsible for providing civic amenities such as water supply, waste management, roads, and public health services.

• They are governed by elected representatives (councillors) and an appointed municipal commissioner.

• Union Territories:

• Union Territories are regions in India directly governed by the Central Government.

• Currently, India has 8 Union Territories, including Delhi, Chandigarh, and Puducherry.

• Some UTs, like Delhi and Puducherry, have partial statehood with legislative assemblies.

• New Delhi Municipal Council (NDMC):

• The NDMC is a municipal council governing the central area of New Delhi.

• It was constituted under the New Delhi Municipal Council Act, 1994, passed by Parliament.

• The council is chaired by a government-appointed officer, typically an IAS officer.

• Constitutional Provisions:

• The 74th Constitutional Amendment Act, 1992, provides the framework for urban local governance in India.

• However, in Union Territories, Parliament has the authority to legislate municipal laws under Article 239 of the Constitution.

Q30. Answer: (a) 72

The logic followed here is:

4 is related to 10 → 4 + 6 = 10

And,

34 is related to 40 → 34 + 6 = 40

Similarly,

66 is related to → 66 + 6 = 72

Hence, "Option 1" is the correct answer.

Q31. Answer: (d) 133

Shortcut Trick

Assume an average of 100 to calculate net deviation.

Deviations from 100: +208, +27, −10, −55, +25, +3.

Sum of deviations = 208 + 27 − 10 − 55 + 25 + 3 = +198.

Average adjustment = 198 ÷ 6 = +33.

Final Average = Assumed Mean + Adjustment = 100 + 33 = 133.

Therefore The correct answer is 133.

Alternate Method

Given: A set of six numbers: 308, 127, 90, 45, 125, and 103.

Formula Used: Arithmetic Mean = (Sum of all observations) ÷ (Total number of observations)

=> Total Sum = 308 + 127 + 90 + 45 + 125 + 103

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=> Sum = 798

=> Number of terms (n) = 6

=> Average = 798 ÷ 6

=> Average = 133

Therefore The correct answer is 133.

Additional Information

Properties of Average

If each given observation is increased or decreased by a constant value k, the new average will also be increased or decreased by k.

Weighted Average

When components have different frequencies, the weighted mean is used: A = (Σw_ix_i) ÷ (Σw_i).

Consecutive Numbers

For a set of numbers in Arithmetic Progression (AP), the average is always the middle term or (First term + Last term) ÷ 2.

Q32. Answer: (b) = DHL, % = SYP

The logic followed here is:

Given: # : EKN :: RVN : %

Option 1) # = DMK, % = SZQ → DMK : EKN :: RVN : SZQ

Option 2) # = DHL, % = SYP → DHL : EKN :: RVN : SYP

Option 3) # = CML, % = PZT → CML : EKN :: RVN : PZT

Option 4) # = CIK, % = PYR → CIK : EKN :: RVN : PYR

Hence, "Option 2" is the correct answer.

Q33. Answer: (b) 5

Given: Seven boxes, A, B, C, D, E, F and G, are kept one over the other but not necessarily in the same order.

1) Only E is kept above D.

2) Only two boxes are kept above C.

Boxes
E
D
C

3) C is kept immediately above F.

Boxes
E
D
C
F

4) G is kept immediately above B.

5) G is not kept in third position from the bottom.

After positioning G and B only one position is left which will be occupied by the only box left i.e. A.

Boxes
E
D
C
F
A
G
B

Thus, five boxes are kept above G.

Hence, "Option 2" is the correct answer.

Q34. Answer: (c) Guide Western Disturbances into India

The correct answer is Guide Western Disturbances into India.

Key Points

• Westerly Jet Streams are fast-moving air currents in the upper atmosphere that significantly influence weather patterns during winter.

• These jet streams play a key role in guiding Western Disturbances, which are extratropical storms originating in the Mediterranean region, into the Indian subcontinent.

• Western Disturbances bring rainfall and snowfall to northern and northwestern India during winter, particularly in the states of Jammu & Kashmir, Himachal Pradesh, and Uttarakhand.

• The Westerly Jet Streams are strongest during winter months due to the temperature gradient between the tropics and polar regions.

• These jet streams significantly influence agricultural activities in India, as the precipitation from Western Disturbances supports Rabi crops like wheat and barley.

Additional Information

• Western Disturbances:

• Western Disturbances are weather systems characterized by low-pressure areas and are carried into India by Westerly Jet Streams.

• They originate over the Mediterranean Sea, Caspian Sea, and Black Sea regions.

• These disturbances cause rainfall and snowfall in the Himalayan region during winter months.

• They are crucial for maintaining the winter crop cycle in northern India.

• Jet Streams:

• Jet streams are narrow bands of strong winds in the upper levels of the atmosphere.

• They are typically found at altitudes of 9-12 km above the Earth's surface.

• Jet streams are caused by the temperature contrast between tropical and polar regions.

• The two major jet streams influencing India are the Westerly Jet Stream (winter) and the Easterly Jet Stream (summer).

• Impact on Indian Climate:

• In winter, Westerly Jet Streams guide Western Disturbances, causing rainfall over northwestern India and the Himalayas.

• In summer, the Easterly Jet Streams contribute to the onset of the Indian monsoon.

• Jet streams significantly affect the distribution and intensity of rainfall in India.

• They also influence temperature patterns and seasonal shifts in weather systems.

• Rabi Crops:

• Rabi crops are winter crops sown in October-November and harvested in March-April.

• Wheat, barley, mustard, and peas are examples of Rabi crops.

• Rainfall from Western Disturbances during winter is essential for their cultivation.

• Regions dependent on Rabi crops are particularly affected by variations in Westerly Jet Streams.

Q35. Answer: (b) OMS

The logic followed here is:

Hence, "Option 2" is the correct answer.

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Q36. Answer: (d) Carboxyl and amino groups

The correct answer is Carboxyl and amino groups.

Key Points

• A peptide bond is a covalent bond formed between the carboxyl group of one amino acid and the amino group of another.

• The reaction is a condensation reaction, resulting in the release of a water molecule.

• This bond forms the backbone of proteins, linking individual amino acids into a polypeptide chain.

• The carboxyl group (-COOH) contributes the carbon atom, while the amino group (-NH2) contributes the nitrogen atom to the peptide bond.

• These functional groups are essential in protein synthesis, which occurs in ribosomes during translation in living cells.

Additional Information

• Amino Acids:

• Amino acids are organic molecules that serve as the building blocks of proteins.

• Each amino acid contains an amino group (-NH2), a carboxyl group (-COOH), a hydrogen atom, and a unique side chain (R-group).

• There are 20 standard amino acids, classified as essential or non-essential based on whether the human body can synthesize them.

• Peptide Bond Formation:

• Peptide bonds are formed during a process called translation, which takes place in ribosomes.

• Enzymes known as peptidyl transferases catalyze the formation of peptide bonds.

• Peptide bonds are strong and have partial double-bond character, restricting rotation around the bond.

• Proteins:

• Proteins are polymers of amino acids linked by peptide bonds, folded into specific three-dimensional structures.

• They perform a variety of functions, including enzymatic activity, structural roles, and signaling.

• Hydrolysis of Peptide Bonds:

• Peptide bonds can be broken down via hydrolysis, which involves the addition of water.

• This process is catalyzed by enzymes such as proteases, which are important in digestion and protein recycling.

Q37. Answer: (d) Only conclusion (II) follows.

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

Conclusions:

(I) Some warriors are leaders → Does not follow (As all leaders are knights and some knights are warriors. So it is possible but not definite)

(II) Some politicians are knights → Follow (As all warriors are politicians and some knights are warriors. As some part pf knights is common with warriors which whole comes in politicians, therefore it is true.)

Therefore Here, Only conclusion (II) follows.

Hence, the correct answer is "Option 4".

Q38. Answer: (a) conciliatory

The correct answer is conciliatory.

Key Points

• Lok Adalat proceedings are non-adversarial and conciliatory, aiming to resolve disputes amicably without prolonged litigation.

• It is governed under the Legal Services Authorities Act, 1987, which promotes alternative dispute resolution mechanisms.

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

• Decisions made in Lok Adalats are binding, and there is no provision for appeal against the award, ensuring finality of the resolution.

• This mechanism is particularly effective in resolving civil cases, matrimonial disputes, and minor criminal offenses, reducing the burden on regular courts.

Additional Information

• Lok Adalat:

• Lok Adalat translates to "People's Court" and is part of India's judicial system aimed at providing speedy justice.

• It operates under the National Legal Services Authority (NALSA).

• Cases resolved include disputes related to motor accident claims, family issues, and unpaid debts.

• Conciliatory Proceedings:

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• Conciliation is a voluntary process where parties come to an agreement with the assistance of a neutral third party.
• It is less formal than mediation and involves facilitating communication between disputants.
• Legal Services Authorities Act, 1987:
• It provides the statutory basis for organizing Lok Adalats and ensuring legal aid to weaker sections of society.
• The Act aims to promote justice on the basis of equal opportunity.
• Advantages of Lok Adalats:
• Ensures resolution without prolonged litigation, saving time and money.
• Encourages amicable settlements and reduces animosity between parties.
• Reduces the burden on conventional courts.

Q39. Answer: (b) 4.7

Shortcut Trick
Ratio of Covered Distance to Remaining Distance = 4 : 3
Total Ratio parts = 4 + 3 = 7 units → 35 km
1 unit = 5 km Therefore Covered Distance = 4 × 5 = 20 km
Time = 4 hours 15 minutes = 4.25 hours
Speed = 20 ÷ 4.25 ≈ 4.7 km/hr
Therefore The correct answer is 4.7 km/hr.
Alternate Method
Given: Total Distance = 35 km, Time = 4 hours 15 minutes.
Formula Used: Speed = Distance ÷ Time
=> Let remaining distance be x.
=> Covered distance = 4/3 × x
=> Total Distance = x + 4/3 × x = 7x/3
=> 7x/3 = 35 => x = (35 × 3) ÷ 7 = 15 km
=> Covered Distance = 35 − 15 = 20 km
=> Time taken = 4 + 15/60 = 4.25 hours
=> Speed = 20 ÷ 4.25 = 4.7058...
Therefore The correct answer is 4.7 km/hr.
Additional Information
Time Conversion
To convert minutes to hours, divide by 60. Example: 15 min = 15/60 = 0.25 hours.
Average Speed
Average Speed = Total Distance ÷ Total Time taken for the journey.
Rounding Decimals
When rounding to one decimal place, check the second decimal; if it is 5 or more, increase the first decimal by 1.

Q40. Answer: (a) 128

Shortcut Trick
If Curved Surface Area (CSA) is half of Total Surface Area (TSA), then CSA = Sum of Area of two bases.
$2\pi rh = 2\pi r^2$
This directly implies Radius (r) = Height (h).
Given h = 128 cm, therefore r = 128 cm.
Therefore The correct answer is 128 cm.
Alternate Method
Given:
Height (h) of the cylinder = 128 cm
Condition: Curved Surface Area = 1/2 × Total Surface Area
Formulas Used:
Curved Surface Area (CSA) = 2πrh
Total Surface Area (TSA) = 2πr(h + r)
Calculations:

=> 2πrh = 1/2 × [2πr(h + r)]
=> 2πrh = πr(h + r)
=> 2h = h + r
=> 2h − h = r
=> r = h
=> r = 128 cm
Therefore The correct answer is 128 cm.
Additional Information
Volume of Cylinder
The amount of space occupied by a cylinder is given by $V = \pi r^2 h$.
Base Area
The area of one circular base of a cylinder is πr^2.
Relation when CSA = 1/3 TSA
If CSA is one-third of TSA, then $2\pi rh = 1/3[2\pi r(h+r)]$, which simplifies to $r = 2h$.

Q41. Answer: (b) Rs. 395.10

Shortcut Trick
Profit on First Pen: Let Marked Price be CP × (1 + 0.75). Net SP = MP × (1 − 0.14).
Effective Profit 1 = 444 × [1.75 × 0.86 − 1] = 444 × 0.505 = 224.22.
Profit on Second Pen = 356 × 48% = 356 × 0.48 = 170.88.
Total Profit = 224.22 + 170.88 = 395.10.
Therefore The correct answer is Rs. 395.10.
Alternate Method
Given → CP1 = Rs. 444, Mark-up = 75%, Discount = 14%, CP2 = Rs. 356, Profit%2 = 48%.
Formulas: Profit = SP − CP | SP = CP × (100 + P%) ÷ 100 × (100 − D%) ÷ 100
=> For the first pen, Mark-up Price = 444 + (75% of 444) = 444 + 333 = Rs. 777.
=> Selling Price of first pen = 777 − (14% of 777) = 777 − 108.78 = Rs. 668.22.
=> Profit from first pen = 668.22 − 444 = Rs. 224.22.
=> Profit from the second pen = 48% of 356 = 0.48 × 356 = Rs. 170.88.
=> Total Profit = 224.22 + 170.88 = Rs. 395.10.
Therefore The correct answer is Rs. 395.10.
Additional Information
Effective Profit Percentage
When a markup (m%) and then a discount (d%) is applied, the net profit% is given by the formula: [m − d − (m × d) ÷ 100].
Marked Price and Selling Price
The relationship between CP and SP through MP is SP = CP × (1 + markup%) × (1 − discount%).

Q42. Answer: (b) I

Given: A, B, C, D, G, H, and I are sitting around a circular table facing the centre.
1) H sits third to the left of G.
2) I sits to the immediate right of G
3) I sits second to the left of D.
4) Only two people sit between D and A when counted from the left of A.
5) B is not an immediate neighbor of H.
After positioning B only one position is left which will be occupied by the only person left i.e. C.
Thus, I sits third to the right of C.
Hence, "Option 2" is the correct answer.

Q43. Answer: (d) 32,400

Shortcut Trick
Convert speed to m/min: 2.7 km/hr × (1000/60) = 45 m/min.
Volume per minute = Area of cross-section × Speed in m/min.
Volume = (20 × 36) × 45 = 720 × 45 = 32,400 m^3.

Therefore The correct answer is 32,400 m³.

Alternate Method

Given: Depth (h) = 20 m, Width (b) = 36 m, Speed = 2.7 km/hr.

Formula Used: Volume of water per unit time = Area × Velocity.

=> Speed of flow in m/hr = 2.7 × 1000 = 2700 m/hr.

=> Speed of flow per minute = 2700 ÷ 60 = 45 m/min.

=> Cross-sectional area of river = Depth × Width = 20 × 36 = 720 m².

=> Volume of water per minute = Area × Length of water column in 1 min.

=> Volume = 720 × 45 = 32,400 m³.

Therefore The correct answer is 32,400 m³.

Additional Information

Flow Rate Measurement

The volume of water flowing through a channel is calculated as the product of the cross-sectional area (Area = Width × Depth) and the flow velocity (Speed).

Unit Conversion

To convert km/hr to m/min, multiply by 1000/60 or 50/3. To convert m³ to Liters, remember 1 m³ = 1000 Liters.

Volume of a Cuboid

Since the river is treated as a rectangular channel, the volume is V = l × b × h, where 'l' is the distance water travels in the given time.

Q44. Answer: (c) 27 cm

Shortcut Trick

Since Δ ABC ~ Δ XYZ, the ratio of their perimeters is equal to the ratio of their corresponding sides.

Ratio of corresponding sides = AB ÷ XY = 6 ÷ 8 = 3 ÷ 4

Perimeter of Δ XYZ = XY + YZ + ZX = 8 + 12 + 16 = 36 cm

Perimeter of Δ ABC = (3 ÷ 4) × 36 = 27 cm

Therefore The correct answer is 27 cm.

Alternate Method

Given:

AB = 6 cm, XY = 8 cm, YZ = 12 cm, ZX = 16 cm

Δ ABC ~ Δ XYZ

Formula Used:

For similar triangles, the ratio of their perimeters is equal to the ratio of their corresponding sides:

AB ÷ XY = BC ÷ YZ = CA ÷ ZX = Perimeter(Δ ABC) ÷ Perimeter(Δ XYZ)

Calculations:

=> Perimeter of Δ XYZ = XY + YZ + ZX

=> Perimeter of Δ XYZ = 8 + 12 + 16 = 36 cm

=> Since Δ ABC ~ Δ XYZ, we have:

=> Perimeter of Δ ABC ÷ Perimeter of Δ XYZ = AB ÷ XY

=> Perimeter of Δ ABC ÷ 36 = 6 ÷ 8

=> Perimeter of Δ ABC ÷ 36 = 3 ÷ 4

=> Perimeter of Δ ABC = (3 ÷ 4) × 36

=> Perimeter of Δ ABC = 3 × 9 = 27 cm

Explanation of incorrect options:

Option (1) 34 cm: Incorrect, as the perimeter must be exactly 27 cm based on the similarity ratio of 3/4.

Option (2) 24 cm: Incorrect, as 24 cm would correspond to a similarity ratio of 2/3, which does not match AB/XY = 6/8 = 3/4.

Option (4) 32 cm: Incorrect, as 32 cm does not satisfy the similarity ratio of 3/4.

Therefore The correct answer is 27 cm.

Additional Information

Properties of Similar Triangles

If two triangles are similar, the ratio of their corresponding sides is equal to the ratio of their perimeters, altitudes, medians, and angle bisectors.

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Area Ratio Theorem

The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides: Area(Δ ABC) ÷ Area(Δ XYZ) = (AB ÷ XY)².

Similarity Criteria

Two triangles are similar if they satisfy Angle-Angle (AA), Side-Angle-Side (SAS), or Side-Side-Side (SSS) similarity conditions.

Q45. Answer: (b) 7 km; South

Given:

Manoj starts from Point A and drives 13 km towards west.

He then takes a right turn, drives 2 km, turns right and drives 7 km.

He then takes a left turn and drives 5 km.

He takes a final right turn, drives 6 km and stops at Point P.

Thus, Manoj should drive 7 km (5 km + 2 km) in the south direction in order to reach point A again.

Hence, "Option 2" is the correct answer.

Q46. Answer: (a) Great Big Beautiful Life

The correct answer is Great Big Beautiful Life.

Key Points

• Great Big Beautiful Life is a contemporary romance novel by Emily Henry, a bestselling author known for her witty and emotionally rich storytelling.

• The plot follows two rival writers, Daphne Vincent and Miles Nowak, competing to secure the rights to write the biography of a notorious heiress, Margaret Ives.

• Published on April 1, 2025, the book has created buzz for its mix of sharp humor and heartfelt drama.

• The narrative shifts between glamorous city backdrops and intimate personal moments, exploring themes of ambition, truth, and the complexities of love in competitive creative circles.

• Early reviews predict it will be a bestseller, praising its dynamic characters and layered, engaging storyline.

Additional Information

• Emily Henry

• Emily Henry is a New York Times bestselling author, known for her works in contemporary romance and fiction genres.

• Some of her other notable works include Beach Read (2020) and People We Meet on Vacation (2021).

• Her books often feature complex, relatable characters and explore themes of love, self-discovery, and personal growth.

• Contemporary Romance Genre

• This genre focuses on love stories set in modern times, often involving relatable characters and realistic settings.

• It is characterized by themes of personal growth, emotional connections, and overcoming obstacles in relationships.

• Authors like Emily Henry, Christina Lauren, and Colleen Hoover are prominent figures in this genre.

• Notorious Heiress Biographies

• Biographies of heiresses often explore themes of wealth, privilege, scandal, and societal expectations.

• Such stories have captivated audiences due to their blend of glamour and intrigue.

• Examples include works on figures like Gloria Vanderbilt and Barbara Hutton, whose lives were marked by both fortune and public scrutiny.

• Reception of Book Lovers

• The novel has received critical acclaim for its witty dialogue and heartfelt storytelling.

• It appeals to fans of romance and literary fiction, making it a favorite among book clubs and casual readers alike.

• Emily Henry's writing style is often praised for blending humor with emotional depth, creating memorable characters and narratives.

Q47. Answer: (b) 672

The logic followed here is:

Hence, "Option 2" is the correct answer.

Q48. Answer: (c) 2

Given series: (Left) 4 @ 7 4 £ 9 9 # @ 1 4 $ % 4 3 8 2 © © 1 5 # (Right)

According to the question such numbers are there which are immediately preceded by a number and also immediately followed by a number:

Required condition: Number - Number - Number

(Left) 4 @ 7 4 £ 9 9 # @ 1 4 $ % 4 3 8 2 © © 1 5 # (Right)

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

Hence, "Option 3" is the correct answer.

Q49. Answer: (b) Palamu Tiger Reserve

The correct answer is Palamu Tiger Reserve.

Key Points

• Palamu Tiger Reserve is located in the Latehar district of Jharkhand and was one of the first nine tiger reserves declared under Project Tiger in 1973.

• The relocation of Jaigir village is part of efforts to reduce human-wildlife conflict and ensure conservation of the core area of the reserve.

• Jaigir is the first village within the core area of Palamu Tiger Reserve that has been successfully relocated to minimize anthropogenic pressures on wildlife habitats.

• The process of relocation involved financial compensation and support to villagers for rehabilitation outside the reserve's core area.

• The initiative aligns with the National Tiger Conservation Authority's (NTCA) guidelines for sustainable conservation practices.

Additional Information

• Project Tiger:

• Launched by the Government of India in 1973 to conserve the tiger population and its habitat.

• Project Tiger is administered by the National Tiger Conservation Authority (NTCA).

• It covers 53 tiger reserves across India as of 2023.

• Core and Buffer Zones:

• Tiger reserves are divided into core and buffer zones for effective management.

• The core zone is strictly protected for wildlife conservation, while the buffer zone accommodates regulated human activities.

• National Tiger Conservation Authority (NTCA):

• NTCA was established in 2005 to strengthen tiger conservation efforts in India.

• It oversees the implementation of Project Tiger and ensures compliance with wildlife protection laws.

• Human-Wildlife Conflict:

• Human-wildlife conflict arises due to overlapping habitats and competition for resources between humans and wildlife.

• Relocation of villages from protected areas is a common strategy to mitigate such conflicts.

Q50. Answer: (a) Madras Presidency

The correct answer is Madras Presidency.

Key Points

• The Poligar Rebellion occurred in the Madras Presidency during the late 18th and early 19th centuries.

• Poligars were feudal chieftains under the Nayak and Vijayanagar rulers who controlled forts and commanded independent armies in South India.

• The rebellion was triggered when the British East India Company tried to abolish the military and land rights of Poligars.

• Key figures in the rebellion include Kattabomman and other Poligar leaders who resisted British authority.

• The suppression of the rebellion led to the consolidation of British power in South India and the dismantling of feudal structures in the region.

Additional Information

• Poligars:

• Poligars were local chieftains who collected taxes and maintained law and order in their respective territories.

• They were known for their military prowess and control over fortified regions.

• Madras Presidency:

• The Madras Presidency was a major administrative division of British India, covering most of South India.

• It was a hub for rebellions like the Poligar Revolt due to strong regional resistance against British policies.

• Kattabomman:

• Kattabomman was a prominent Poligar leader from Tamil Nadu who opposed British control.

• He became a symbol of resistance and is remembered for his courage and defiance against colonial rule.

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• Impact of the Rebellion:

• The suppression of Poligars marked the decline of feudal autonomy in South India.

• The rebellion highlighted the growing discontent against British policies and led to stricter administrative measures.

Q51. Answer: (b) Nagaland and Arunachal Pradesh

The correct answer is Nagaland and Arunachal Pradesh.

Key Points

• The Konyak tribe is primarily found in the northeastern states of Nagaland and parts of Arunachal Pradesh.

• They are one of the largest tribes in Nagaland, predominantly residing in the Mon district.

• The Konyaks are traditionally known as fierce warriors and have a unique culture, including their practice of headhunting in the past.

• Their tribal identity is marked by tattoos, which symbolize their achievements and social status.

• They are skilled in handicrafts, blacksmithing, and agriculture, contributing significantly to their local economy.

Additional Information

• Head-Hunting Practice:

• The Konyak tribe was historically known for its practice of headhunting, which was a significant cultural ritual symbolizing bravery and strength.

• This practice ended decades ago due to the influence of Christianity and modern governance.

• Traditional Attire and Tattoos:

• Konyak men and women wear distinctive tribal attire adorned with beads, feathers, and ornaments.

• Their facial and body tattoos were traditionally earned after successful headhunting expeditions.

• Aoling Festival:

• The Konyak tribe celebrates the Aoling festival, marking the arrival of spring and the start of the agricultural season.

• It is observed in the first week of April and includes traditional dances, songs, and rituals.

• Language and Culture:

• The Konyak tribe speaks the Konyak language, which belongs to the Tibeto-Burman language family.

• They are known for preserving their indigenous traditions and oral folklore passed down through generations.

Q52. Answer: (a) 54

Given equation: 8 ÷ 7 + 56 × 14 − 2 = ?

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

8 ÷ 7 + 56 × 14 − 2 = ? => 8 × 7 − 56 ÷ 14 + 2 = ?

=> 8 × 7 − 56 ÷ 14 + 2 = ?

=> 8 × 7 − 4 + 2 = ?

=> 56 + 2 − 4 = ?

=> 58 − 4 = ?

=> 54 = ?

Hence, "Option 1" is the correct answer.

Q53. Answer: (d) Medical device manufacturers

The correct answer is Medical device manufacturers.

Key Points

• In September 2024, the Uniform Code of Pharmaceutical Marketing Practices (UCPMP) extended its guidelines to medical device manufacturers for ethical marketing and promotion practices.

• The UCPMP aims to regulate and ensure transparency in interactions between pharmaceutical companies and healthcare professionals, now including medical device manufacturers.

• The extension of UCPMP to medical device manufacturers highlights the growing importance of ethical considerations in the healthcare and medical device industry.

• Under these guidelines, medical device manufacturers are expected to adhere to ethical standards in advertising, promotions, and interactions with healthcare providers.

• This move aligns with the government's efforts to strengthen accountability and safeguard patient interests in the healthcare sector.

Additional Information

• Uniform Code of Pharmaceutical Marketing Practices (UCPMP)

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• The UCPMP was introduced by the Department of Pharmaceuticals, Government of India, to regulate marketing practices in the pharmaceutical industry.

• It seeks to prevent unethical practices such as excessive gifts, inducements, or sponsorships offered to healthcare professionals.

• It emphasizes transparency, accountability, and ethical promotional practices in the healthcare sector.

• Medical Devices Industry in India

• India has one of the fastest-growing medical device markets globally, valued at approximately USD 11 billion in 2022.

• The sector is regulated by the Central Drugs Standard Control Organization (CDSCO) under the Drugs and Cosmetics Act.

• Medical devices range from diagnostic tools and surgical instruments to advanced imaging and therapeutic equipment.

• Ethical Marketing Practices

• Ethical marketing ensures that healthcare products are promoted in a manner that prioritizes patient welfare and safety.

• It includes accurate representation of product benefits, avoiding misleading claims, and transparent interactions with healthcare professionals.

• Impact of UCPMP Extension

• The inclusion of medical device manufacturers under UCPMP guidelines is expected to enhance trust among healthcare providers and patients.

• It promotes fair competition and deters unethical practices within the medical device industry.

Q54. Answer: (d) 1911

The correct answer is 1911.

Key Points

• The Partition of Bengal was implemented by the British in 1905 under Lord Curzon’s administration, dividing Bengal into East Bengal and Assam, and West Bengal.

• It faced fierce opposition from Indian leaders and the general public, leading to protests, boycotts, and the Swadeshi Movement.

• Due to the intense backlash, the British annulled the partition in 1911 during the Delhi Durbar held to commemorate King George V's coronation.

• Post-annulment, Bengal was reunited, but Bihar and Orissa were carved out as separate provinces to ease administrative challenges.

• The annulment symbolized the growing strength of Indian nationalism and the organized resistance against British policies.

Additional Information

• Partition of Bengal (1905):

• The division was justified by the British as an administrative necessity due to Bengal’s large size and population.

• East Bengal was predominantly Muslim, while West Bengal had a Hindu majority, leading to communal undertones in the partition.

• Swadeshi Movement:

• A key response to the partition, promoting the boycott of British goods and the use of indigenous products.

• It marked the beginning of organized nationalist movements in India.

• Delhi Durbar (1911):

• It was a grand event to mark the coronation of King George V and Queen Mary.

• During this event, the British announced the annulment of the Partition of Bengal and the transfer of the capital from Calcutta to Delhi.

• Impact on Indian Nationalism:

• The partition and its annulment highlighted the importance of mass movements and unity among Indians.

• It strengthened the resolve of Indian leaders to fight for independence and helped unite various communities.

Q55. Answer: (a) 44/125

Shortcut Trick

Given $\cot\theta = 3/4$ (Base/Perpendicular), so $\sin\theta = 4/5$.

Apply direct formula: $\sin 3\theta = 3\sin\theta - 4\sin^3\theta$.

=> $\sin 3\theta = 3(4/5) - 4(4/5)^3 = 12/5 - 256/125$.

=> $(300 - 256)/125 = 44/125$.

Therefore The correct answer is 44/125.

Alternate Method

Given: $\cot\theta = 3/4$

Formula Used: $\sin 3\theta = 3\sin\theta - 4\sin^3\theta$

=> In a right-angled triangle, if cot θ = Base/Perpendicular = 3/4,

=> Hypotenuse (H) = √(3² + 4²) = √(9 + 16) = 5.

=> sin θ = Perpendicular/Hypotenuse = 4/5.

=> sin 3θ = 3(4/5) − 4(4/5)³

=> sin 3θ = 12/5 − 4(64/125)

=> sin 3θ = 12/5 − 256/125

=> sin 3θ = (12 × 25 − 256) / 125

=> sin 3θ = (300 − 256) / 125 = 44/125.

Therefore The correct answer is 44/125.

Additional Information

Multiple Angle Formulas

cos 3θ = 4 cos³θ − 3 cos θ and tan 3θ = (3 tan θ − tan³θ) / (1 − 3 tan²θ).

Pythagorean Triplet

The numbers (3, 4, 5) form a Pythagorean triplet where 3² + 4² = 5².

Trigonometric Ratios

sin θ = 1/cosec θ, cos θ = 1/sec θ, and tan θ = 1/cot θ.

Q56. Answer: (b) 5

Given series: (Left) @ 5 4 £ 8 & © £ * 2 5 9 $ 6 £ 4 * 8 $ 4 % * (Right)

According to the question such symbols are there which are immediately preceded by a number and also immediately followed by a number:

Required condition: Number - Symbols - Number

(Left) @ 5 4 £ 8 & © £ * 2 5 9 $ 6 £ 4 * 8 $ 4 % * (Right)

Thus, there are five such symbols are there which are immediately preceded by a number and also immediately followed by a number.

Hence, "Option 2" is the correct answer.

Q57. Answer: (b) Article 32

The correct answer is Article 32.

Key Points

• Article 32 of the Indian Constitution empowers the Supreme Court to issue writs for the enforcement of Fundamental Rights.

• Writs under Article 32 include Habeas Corpus, Mandamus, Prohibition, Certiorari, and Quo Warranto.

• It is often referred to as the "heart and soul" of the Constitution, as described by Dr. B.R. Ambedkar, for safeguarding fundamental rights.

• This article provides the right to individuals to directly approach the Supreme Court in case of violation of their Fundamental Rights.

• The jurisdiction of Article 32 makes the Supreme Court the guardian and protector of Fundamental Rights.

Additional Information

• Habeas Corpus: A writ to produce a person before the court to ensure they are not detained unlawfully.

• Mandamus: A writ issued to a public official or body to perform a duty that they are legally obligated to fulfill.

• Prohibition: A writ issued by a higher court to prevent a lower court or tribunal from exceeding its jurisdiction.

• Certiorari: A writ issued by a higher court to review the decision or proceedings of a lower court or tribunal.

• Quo Warranto: A writ to question the legality of a person holding a public office.

• Besides Article 32, High Courts are empowered to issue writs under Article 226, but the scope of Article 226 is wider as it includes not just Fundamental Rights but also other legal rights.

• The right to constitutional remedies, as provided under Article 32, is itself a Fundamental Right, ensuring citizens' access to justice.

• In certain situations, the enforcement of Fundamental Rights under Article 32 may be suspended during the proclamation of Emergency under Article 359 of the Constitution.

Q58. Answer: (d) 16

Given equation: 43 + 15 ÷ 2 – 12 × 4 = ?

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

43 + 15 ÷ 2 – 12 × 4 = ? => 43 – 15 × 2 + 12 ÷ 4 = ?

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=> 43 – 15 × 2 + 12 ÷ 4 = ?

=> 43 – 15 × 2 + 3 = ?

=> 43 + 3 – 30 = ?

=> 46 – 30 = ?

=> 16 = ?

Hence, "Option 4" is the correct answer.

Q59. Answer: (d) Shaktikanta Das

The correct answer is Shaktikanta Das.

Key Points

• Shaktikanta Das, the former Governor of the Reserve Bank of India (RBI), is recognized for his significant contributions to India's financial and economic policies.

• He was appointed as the Principal Secretary-2 to PM Narendra Modi in February 2025, reinforcing his pivotal role in India's economic governance.

• Shaktikanta Das has served in various key positions, including Secretary of the Department of Economic Affairs and Secretary of Revenue in the Ministry of Finance.

• He played a crucial role in implementing economic reforms, such as the Goods and Services Tax (GST) and measures to strengthen fiscal policy frameworks.

• Das's appointment aligns with the government's commitment to leveraging experienced policymakers for enhancing governance and driving economic growth.

Additional Information

• Principal Secretary Role

• The Principal Secretary is one of the most senior bureaucratic positions in India, directly responsible for advising the Prime Minister on policy matters and implementation strategies.

• Principal Secretaries often coordinate among ministries and departments, ensuring seamless execution of government initiatives.

• The appointment reflects trust in the individual's expertise, experience, and ability to manage critical national issues.

• Shaktikanta Das's Contributions

• He spearheaded the demonetization initiative in November 2016, playing a key role in its implementation and communication strategy.

• Das has been instrumental in shaping India's Monetary Policy Framework during his tenure at RBI.

• Under his leadership, RBI has focused on financial inclusion initiatives, improving access to banking services for underserved populations.

• RBI's Role in Economic Governance

• The Reserve Bank of India (RBI) is responsible for regulating the monetary policy, ensuring the stability of the financial system, and promoting economic growth.

• Key functions include controlling inflation, managing currency supply, and ensuring liquidity in the economy.

• Economic Reforms in India

• India has witnessed significant economic reforms, such as GST, Insolvency and Bankruptcy Code (IBC), and fiscal consolidation measures.

• These reforms aim to streamline taxation, improve ease of doing business, and strengthen the financial system.

Q60. Answer: (b) 6

Shortcut Trick

Since the total expenditure (Rs. 1) is constant, the quantity is inversely proportional to the price.

Price ratio (CP : SP) = 100 : 120 = 5 : 6.

Quantity ratio (CP : SP) = 6 : 5.

Given SP quantity = 5 units = 5 chocolates.

Therefore CP quantity = 6 units = 6 chocolates.

Therefore The correct answer is 6 chocolates.

Alternate Method

Given: Selling Price (SP) of 5 chocolates = Rs. 1, Profit % = 20%.

Formulas: CP = [SP × 100] ÷ [100 + Profit%]

=> SP of 1 chocolate = Rs. (1/5).

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=> CP of 1 chocolate = [(1/5) × 100] ÷ (100 + 20).

=> CP of 1 chocolate = [20] ÷ 120 = Rs. (1/6).

=> Since CP of 1 chocolate is Rs. (1/6), the number of chocolates bought for Rs. 1 = 6.

Therefore The correct answer is 6 chocolates.

Additional Information

Price and Consumption Relationship

When the total expenditure remains constant, the quantity (consumption) is inversely proportional to the price per unit. Formula: Price × Quantity = Expenditure.

Profit and Loss on Unit Basis

It is always easier to calculate the Cost Price or Selling Price for a single unit to avoid confusion with bulk quantities.

Q61. Answer: (a) Click inside a text placeholder and start typing

The correct answer is Click inside a text placeholder and start typing.

Key Points

• In MS PowerPoint, a text placeholder is a predefined area on the slide where text can be added easily.
• To add text, simply click inside the text placeholder and start typing your content.
• Placeholders are commonly found in slide layouts such as title slides, content slides, or bullet list slides.
• Text placeholders are designed to help maintain a consistent slide design and formatting throughout the presentation.
• Users can customize the font, color, size, and alignment of the text after typing to match their requirements.

Additional Information

• Text Placeholder:
• It is a box with dotted or dashed borders visible in slide layouts.
• Placeholders can also hold images, charts, tables, or other elements, but their default purpose is often text input.
• Slide Layouts:
• Each slide layout in MS PowerPoint determines the positioning of placeholders for title, content, and other elements.
• Common layouts include "Title Slide," "Title and Content," and "Two Content."
• Keyboard Shortcut Tips:
• There is no direct shortcut like Ctrl + T to add text; placeholders must be clicked manually.
• However, users can use shortcuts like Ctrl + A to select all text or Ctrl + E to center-align text.
• Custom Text Boxes:
• If no placeholder exists, users can insert a custom text box via the "Insert" tab.
• Select "Text Box," click on the slide, and then type text into the custom box.
• Formatting Options:
• Text formatting options are available under the "Home" tab in the Ribbon.
• Users can adjust font styles, apply bold/italic/underline effects, and change text colors.

Q62. Answer: (d) Shift + Delete

The correct answer is Shift + Delete.

Key Points

• The Shift + Delete keyboard shortcut in Windows OS permanently deletes a file without sending it to the Recycle Bin.
• This action bypasses the Recycle Bin, making recovery of the file more difficult unless specialized software is used.
• It is a quick method to remove unwanted files permanently and save disk space.
• Users are advised to exercise caution while using this shortcut, as accidental deletions may require advanced recovery tools.
• Files deleted using this method do not consume space in the Recycle Bin and are immediately removed from the file system.

Additional Information

• Recycle Bin
• The Recycle Bin is a feature in Windows OS used to temporarily store deleted files.
• Files moved to the Recycle Bin can be restored unless the bin is emptied.
• It serves as a safeguard against accidental deletions.
• File Recovery
• Files permanently deleted using Shift + Delete can sometimes be recovered using third-party recovery tools.
• Examples of such tools include Recuva, EaseUS Data Recovery Wizard, and Disk Drill.

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• File System
• The file system in Windows OS (e.g., NTFS, FAT32) manages how data is stored and retrieved on storage devices.
• Permanently deleted files are marked as free space in the file system and may be overwritten by new data.
• Best Practices
• Always double-check before using Shift + Delete to ensure important files are not deleted accidentally.
• Maintain regular backups to avoid permanent data loss.

Q63. Answer: (c) 45:15

Shortcut Trick
Check the options against the condition: 5 years ago, Father was 4 times Son.
Option (1) 32, 8 → 5 yrs ago: 27, 3 (9 times) ×
Option (2) 50, 20 → 5 yrs ago: 45, 15 (3 times) ×
Option (3) 45, 15 → 5 yrs ago: 40, 10 (4 times) Yes
Second condition check: (15+15) : 45 = 30 : 45 = 2 : 3 Yes
Therefore The correct answer is 45:15 years.
Alternate Method
Given: Ratio after 15 yrs (Son) to Present (Father) = 2 : 3. Ratio 5 yrs ago F : S = 4 : 1.
=> Let ages 5 years ago be Father = 4x and Son = x.
=> Present age of Father = 4x + 5 and Son = x + 5.
=> Son's age after 15 years = (x + 5) + 15 = x + 20.
=> According to question: (x + 20) / (4x + 5) = 2 / 3
=> 3(x + 20) = 2(4x + 5)
=> 3x + 60 = 8x + 10
=> 5x = 50 => x = 10.
=> Present Father = 4(10) + 5 = 45 years.
=> Present Son = 10 + 5 = 15 years.
Therefore The correct answer is 45:15 years.
Additional Information
Age Ratio Constant Difference
The numerical difference between the ages of two persons always remains constant regardless of the number of years passed.
Present Age Conversion
If age 'n' years ago is x, present age is x + n. If age after 'n' years is y, present age is y − n.

Q64. Answer: (a) 8.54

Shortcut Trick
The given ages form an Arithmetic Progression (AP) with common difference d = 5 and number of terms n = 6.
Shortcut formula for Standard Deviation (σ) of an AP: $\sigma = d \times \sqrt{[(n^2 - 1) / 12]}$
$\sigma = 5 \times \sqrt{[(6^2 - 1) / 12]} = 5 \times \sqrt{(35 / 12)} = 5 \times \sqrt{2.9167}$
$\sigma \approx 5 \times 1.7078 = 8.539$
Therefore The correct answer is 8.54 years.
Alternate Method
Given: Ages = 25, 30, 35, 40, 45, 50 | Number of people (N) = 6.
Formula: Standard Deviation (σ) = $\sqrt{[\Sigma(x - \mu)^2 / N]}$, where μ is the mean.
=> Mean (μ) = (25 + 30 + 35 + 40 + 45 + 50) / 6 = 225 / 6

Q65. Answer: (a) Joule

The correct answer is Joule.
Key Points
• The SI (International System of Units) unit of energy is the Joule (symbol: J).
• One Joule is defined as the energy transferred when a force of one newton moves an object by one meter.
• The Joule is named after the physicist James Prescott Joule, who contributed significantly to the study of energy.
• 1 Joule is equivalent to 1 Newton-meter (N·m) or 1 $kg \cdot m^2/s^2$ in base SI units.
• Joule is used to measure various forms of energy, including kinetic energy, potential energy, thermal energy, and electrical

energy.

Additional Information

• Watt:

• Watt (W) is the SI unit of power, not energy.

• 1 Watt is defined as 1 Joule per second (1 W = 1 J/s).

• Kelvin:

• Kelvin (K) is the SI unit of temperature, not energy.

• It is used to measure the thermodynamic temperature scale.

• Newton:

• Newton (N) is the SI unit of force, not energy.

• 1 Newton is the force required to accelerate a 1 kg mass by 1 meter per second squared (1 N = 1 kg·m/s²).

• Relationship Between Energy and Work:

• Energy is the capacity to do work, and work is the transfer of energy.

• Both energy and work are measured in Joules.

• Other Common Units of Energy:

• Calorie (cal): Commonly used in food energy, 1 cal = 4.184 Joules.

• Electronvolt (eV): Used in atomic and particle physics, 1 eV = 1.602 × 10^-¹^9 Joules.

Q66. Answer: (a) Chairperson and five members

The correct answer is Chairperson and five members.

Key Points

• The National Human Rights Commission (NHRC) of India consists of a Chairperson and five full-time members.

• The Chairperson is typically a retired Chief Justice of India, ensuring the highest level of judicial oversight in human rights matters.

• The five members include four full-time members and one ex-officio member who serves as the Chairperson of the National Commission for Scheduled Castes, Scheduled Tribes, Minorities, and Women.

• The NHRC was established on 12 October 1993 under the Protection of Human Rights Act, 1993.

• It aims to protect and promote human rights in India, including rights related to life, liberty, equality, and dignity of individuals.

Additional Information

• Human Rights:

• Human rights are fundamental rights that protect the dignity and freedom of individuals.

• They include rights such as freedom of speech, equality before the law, and protection against discrimination.

• Protection of Human Rights Act, 1993:

• This act provides for the establishment of the NHRC and State Human Rights Commissions (SHRCs).

• It outlines the powers and functions of the NHRC, including investigating human rights violations and recommending corrective measures.

• Functions of NHRC:

• Investigating complaints of human rights violations.

• Conducting inquiries, recommending reforms, and promoting awareness of human rights.

• It also reviews acts that may result in the violation of human rights and suggests remedies.

• Composition of NHRC:

• Chairperson: A retired Chief Justice of India.

• Four full-time members: Including individuals with judicial and human rights expertise.

• Ex-officio members from relevant commissions representing vulnerable sections of society.

Q67. Answer: (a) Aag Ka Darya

The correct answer is Aag Ka Darya.

Key Points

• Aag Ka Darya (River of Fire) was written by Qurratulain Hyder in 1959 and is considered one of the most important works in Urdu literature.

• The novel spans over two millennia, exploring the cultural, social, and political history of the Indian subcontinent.

• It is known for its profound examination of the effects of the Partition of India (1947) on individuals and society.

• The book delves deeply into themes of identity, displacement, and the continuity of civilization, connecting ancient and modern

times.

• Qurratulain Hyder is often referred to as the "Grande Dame of Urdu Literature" for her contribution to the literary world.

Additional Information

• Partition of India (1947):

• The partition led to the division of British India into two independent dominions, India and Pakistan, causing massive displacement and communal violence.

• It remains one of the most significant and tragic events in South Asian history, affecting millions of lives.

• Qurratulain Hyder:

• Born in 1927, Hyder was an iconic Urdu novelist, short story writer, and translator, who received numerous accolades for her work, including the Jnanpith Award.

• Her literary contributions include novels like "Mere Bhi Sanamkhane" and "Kar e Jahan Daraz Hai."

• Aag Ka Darya - Literary Style:

• The novel utilizes a multi-layered narrative structure, intertwining historical and fictional elements.

• It incorporates characters from different time periods, blending personal stories with historical events.

• Urdu Literature:

• Urdu literature has a rich tradition of poetry and prose, with notable works in genres such as ghazals, novels, and short stories.

• Writers like Mirza Ghalib, Saadat Hasan Manto, and Ismat Chughtai have made significant contributions to Urdu literature.

Q68. Answer: (c) 4

Given: P, Q, R, S, T, U and V are sitting around a circular table facing the centre.

1) Both Q and V are immediate neighbours of S.

2) V sits third to the left of T.

3) R sits to the immediate left of T.

4) U is not an immediate neighbour of V.

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

Thus, four people sit between S and U when counted from the right of S.

Hence, "Option 3" is the correct answer.

Q69. Answer: (b) Tube wells and canals

The correct answer is Tube wells and canals.

Key Points

• Tube wells and canals account for the largest share of irrigation in India, contributing significantly to agricultural productivity.

• Canals are prominent irrigation sources in areas like Punjab, Haryana, and Uttar Pradesh due to their extensive network and water availability.

• Tube wells rely on groundwater extraction, making them widely used in regions with low surface water availability, such as Rajasthan and parts of Maharashtra.

• The Green Revolution further promoted the use of tube wells and canals, especially in northern India, to ensure reliable water supply for high-yield crops.

• Together, tube wells and canals irrigate a significant portion of India's agricultural land, ensuring food security for the growing population.

Additional Information

• Canal Irrigation:

• Canals are artificial waterways that distribute water from rivers or reservoirs to agricultural fields.

• They are particularly effective in regions with flat terrain and abundant surface water sources.

• India has an extensive canal network, with major projects like the Indira Gandhi Canal in Rajasthan.

• Tube Wells:

• Tube wells are deep bore wells equipped with pumps to extract groundwater for irrigation.

• They are widely used in areas where surface water sources are scarce or unreliable.

• Excessive use of tube wells has led to groundwater depletion in certain regions, necessitating sustainable practices.

• Rainwater Harvesting:

• Rainwater harvesting involves collecting and storing rainwater for irrigation and other purposes.

• Though beneficial, it is a secondary source of irrigation compared to tube wells and canals in India.

• Tank Irrigation:

• Tanks are small water reservoirs used primarily in southern states like Tamil Nadu and Karnataka.
• They provide water for irrigation during dry seasons but have limited coverage compared to tube wells and canals.

Q70. Answer: (d) 3,00,000

Shortcut Trick
Total Expenditure % = 30% + 25% + 15% + 16% = 86%
Savings % = 100% − 86% = 14%
14% of Salary = Rs. 42,000
100% (Total Salary) = (42000 ÷ 14) × 100 = 3000 × 100 = Rs. 3,00,000
Therefore The correct answer is Rs. 3,00,000.
Alternate Method
Given:
House Rent = 30% | Food = 25% | Medical = 15% | Others = 16%
Monthly Savings = Rs. 42,000
Calculations:
=> Total spending = 30 + 25 + 15 + 16 = 86%
=> Let total monthly salary be S.
=> Savings = S − (86% of S) = 14% of S
=> 14/100 × S = 42,000
=> S = (42,000 × 100) ÷ 14
=> S = 3,000 × 100 = 3,00,000
Therefore The correct answer is Rs. 3,00,000.
Additional Information
Percentage Expenditure
When percentages are given on the total salary, simply add them to find total expenditure. Savings % = 100% − Total Expenditure %.
Remaining Balance Concept
If the question states % of remaining salary, use the successive formula: Final = Initial × (1 − r1/100) × (1 − r2/100).
Base Value Calculation
Total Value = (Given Value ÷ Percentage of that Value) × 100.

Q71. Answer: (c) To propose strategies for enhancing India's role in global automotive value chains

The correct answer is To propose strategies for enhancing India's role in global automotive value chains.
Key Points
• The report by NITI Aayog aims to outline strategic measures for enhancing India's participation in global automotive value chains.
• It focuses on aligning India's automotive industry policies with global standards to boost competitiveness and innovation.
• Key areas addressed include technology adoption, skill development, and fostering collaboration between stakeholders.
• The report emphasizes strengthening exports, improving supply chain efficiency, and leveraging India's manufacturing capacity.
• Promoting sustainable practices and integrating advanced technologies like electric vehicles (EVs) and autonomous systems are highlighted as vital strategies.
Additional Information
• Global Value Chains (GVCs):
• GVCs refer to the international division of production, where different stages of the manufacturing process are carried out in various countries.
• Participation in GVCs helps nations integrate into the global economy and enhance their trade competitiveness.
• India's Automotive Industry:
• India is the world's fourth-largest automotive market and a major exporter of vehicles and auto components.
• The industry contributes significantly to India's GDP and provides employment to millions of workers.
• Electric Vehicles (EVs) and Sustainability:
• EVs are a critical focus area in India's automotive strategy to reduce dependence on fossil fuels and promote sustainability.
• India aims to achieve 30% EV penetration by 2030 under its National Electric Mobility Mission Plan (NEMMP).
• Skill Development in the Automotive Sector:

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• Upskilling and reskilling workers are essential to adapt to technological changes in the automotive industry.

• Initiatives like the Automotive Skills Development Council (ASDC) work towards training the workforce for emerging technologies.

Q72. Answer: (d) KMQ 20

The logic followed here is:

Hence, "Option 4" is the correct answer.

Q73. Answer: (c) Dr. R Balasubramaniam

The correct answer is Dr. R Balasubramaniam.

Key Points

• Dr. R Balasubramaniam is the author of the book 'Power Within: The Leadership Legacy of Narendra Modi', which reflects on PM Modi's leadership values and principles.

• The book captures the journey of Narendra Modi's leadership and its transformative impact on the nation and governance.

• Dr. R Balasubramaniam is a leadership expert and founder of the Swami Vivekananda Youth Movement (SVYM), an organization working towards community development and education.

• The book examines leadership lessons from the life of PM Modi, particularly focusing on decision-making, resilience, and public service.

• It is widely appreciated for its insights into political leadership and provides actionable principles for leaders across domains.

Additional Information

• Dr. R Balasubramaniam

• He is a public policy expert, leadership trainer, and social worker with decades of experience in grassroots development.

• He has served on several government committees and advisory boards, including the Lokpal Search Committee in India.

• Dr. Balasubramaniam is the author of several other books focused on leadership and social transformation.

• Leadership Legacy

• The concept of leadership legacy emphasizes the long-term impact of a leader's actions on their organization, community, or nation.

• PM Narendra Modi's leadership is often characterized by visionary policy-making, resilience, and grassroots connection.

• Swami Vivekananda Youth Movement (SVYM)

• A non-profit organization founded by Dr. R Balasubramaniam in 1984, based on the teachings of Swami Vivekananda.

• It focuses on healthcare, education, and leadership development in rural and tribal communities.

• Books on PM Modi's Leadership

• Several books have been written about PM Narendra Modi's governance, including 'The Modi Effect' by Lance Price and 'Narendra Modi: The Man, The Times' by Nilanjan Mukhopadhyay.

• These books explore various aspects of Modi's leadership style, policy initiatives, and political strategies.

Q74. Answer: (b) Chaman Arora

The correct answer is Chaman Arora.

Key Points

• Chaman Arora won the Sahitya Akademi Award 2024 for his work in Dogri literature.

• The awarded book, titled 'Ik Hor Ashwthama', is a notable contribution to the Dogri literary tradition.

• The Sahitya Akademi Award recognizes exceptional literary works in 24 Indian languages, including Dogri.

• This prestigious award is presented annually by the Sahitya Akademi, India's National Academy of Letters.

• The award includes a cash prize of Rs. 1,00,000, along with a citation and a memento.

Additional Information

• Sahitya Akademi Award:

• Established in 1954, the award celebrates literary excellence in India's diverse languages.

• It is aimed at promoting and preserving India's rich linguistic heritage.

• The award encompasses genres like novels, poetry, short stories, essays, and plays.

• Only works published in the preceding five years are eligible for nomination.

• Dogri Language:

• Dogri is one of the 22 scheduled languages recognized by the Indian Constitution.

• It is primarily spoken in the Jammu region of Jammu & Kashmir.

• The language is known for its rich oral tradition and vibrant folk literature.

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• Dogri gained official recognition as a scheduled language in 2003.
• Literary Significance of 'Ik Hor Ashwthama':
• 'Ik Hor Ashwthama' draws inspiration from Indian mythology, exploring themes of immortality and human conflict.
• The book is celebrated for its powerful storytelling and unique narrative structure.
• It reflects contemporary societal issues through the lens of Dogri literature.
• Sahitya Akademi:
• The Sahitya Akademi operates under the Ministry of Culture, Government of India.
• It also organizes literary seminars, workshops, and fellowships to promote literary activities across India.

Q75. Answer: (a) Mother's mother

Decoding the Symbols:

A is				
Symbol	•	−	×	÷
Meaning	Mother	Brother	Wife	Father
to B				

Given: M + N − O × P ÷ Q
M + N → M is the mother of N.
N − O → N is the brother of O.
O × P → O is the wife of P.
P ÷ Q → P is the father of Q.
Thus, M is Q's maternal grandmother or mother's mother.
Hence, "Option 1" is the correct answer.

Q76. Answer: (c) UPC : XSF

The logic followed here is:
Given:
JAY : MDB
And,
PAN : SDQ
Similarly,
Option 3) UPC : XSF
Hence, "Option 3" is the correct answer.

Q77. Answer: (b) Cristiano Ronaldo

The correct answer is Cristiano Ronaldo.
Key Points
• Cristiano Ronaldo became the first footballer to score 900 professional career goals, including goals scored for both club and country, in April 2025.
• The milestone was achieved during his tenure with Al-Nassr, the Saudi Arabian club he joined in 2023 after leaving Manchester United.
• Ronaldo is widely regarded as one of the greatest football players of all time, consistently breaking records in his illustrious career.
• His goals include contributions to clubs such as Sporting CP, Manchester United, Real Madrid, Juventus, and Al-Nassr, as well as the Portuguese national team.
• As of 2025, Ronaldo remains the all-time leading scorer for the UEFA Champions League and the Portuguese national team.
Additional Information
• Professional Career Goals:
• This statistic encompasses all goals scored in official matches for clubs and national teams, including league games, domestic cups, international tournaments, and qualifiers.
• Other notable players nearing this milestone include Lionel Messi, who remains a close competitor in terms of career goals.
• Ronaldo's Career Highlights:
• He has won five Ballon d'Or awards, recognizing him as the best player in the world.

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• He holds the record for the most goals scored in a single UEFA Champions League season (17 goals in 2013-14).
• Ronaldo is the first player in history to win league titles in England, Spain, and Italy.
• Influence on Modern Football:
• Ronaldo's exceptional goal-scoring ability, athleticism, and dedication to fitness have set a benchmark for upcoming footballers.
• He is a global icon, with sponsorships from brands like Nike, and has built his own CR7 brand.
• Al-Nassr and Saudi Pro League:
• Ronaldo joined Al-Nassr in 2023, marking a significant shift in his career to the Saudi Pro League.
• His presence has increased the global visibility of the league and attracted other international players to the region.

Q78. Answer: (d) 118

The logic followed here is:

Hence, "Option 4" is the correct answer.

Alternate Method

Q79. Answer: (a) Rs. 1,59,964 crore

The correct answer is Rs. 1,59,964 crore.

Key Points

• The budget allocation for the Ministry of Rural Development for the fiscal year 2023-24 was Rs. 1,59,964 crore.
• This allocation was aimed at improving rural infrastructure, livelihood creation, and poverty alleviation in rural areas.
• Key schemes under the Ministry of Rural Development include Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Pradhan Mantri Gram Sadak Yojana (PMGSY), and National Social Assistance Programme.
• The increased funding reflects the government's emphasis on strengthening rural development programs to ensure sustainable growth.
• It supports initiatives aimed at bridging the urban-rural divide and enhancing the quality of life in rural regions.

Additional Information

• Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
• MGNREGA is a flagship rural employment scheme that guarantees at least 100 days of wage employment in a financial year to rural households.
• It focuses on creating durable assets such as roads, water conservation structures, and irrigation facilities.
• The scheme plays a crucial role in poverty alleviation and empowering rural communities.
• Pradhan Mantri Gram Sadak Yojana (PMGSY)
• PMGSY aims to provide all-weather road connectivity to unconnected villages in India.
• The scheme is instrumental in improving access to markets, healthcare, and education in rural areas.
• It contributes significantly to rural infrastructure development and economic growth.
• National Social Assistance Programme (NSAP)
• NSAP provides financial assistance to the elderly, widows, and persons with disabilities in the form of pensions.
• The program is a part of India's social safety net for vulnerable sections of society.
• It aims to ensure minimum income support and dignity for marginalized individuals.
• Importance of Rural Development
• Rural development is crucial for reducing poverty and unemployment in rural areas.
• Investments in rural infrastructure, education, and healthcare help bridge the urban-rural divide.
• It fosters sustainable economic growth and improves the quality of life for the rural population.

Q80. Answer: (c) The Foreigners Act, 1946

The correct answer is The Foreigners Act, 1946.

Key Points

• The Immigration and Foreigners Bill, 2025, was enacted to modernize and consolidate laws governing immigration, foreigners, and their regulation in India.
• The legislation specifically repealed The Foreigners Act, 1946, which had been the primary legal framework governing the entry, stay, and deportation of foreigners in India for decades.
• The Foreigners Act, 1946, was considered outdated and inadequate to address the complexities of contemporary immigration and border security challenges.
• The new bill aims to establish a more comprehensive and technology-driven approach to managing immigration and foreigner-related matters.

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• The bill introduces provisions for e-governance, better monitoring of foreign nationals, and streamlined deportation processes.

Additional Information

• The Foreigners Act, 1946:

• It was enacted by the British Government to regulate the entry, presence, and departure of foreigners in India.

• The Act empowered the government to declare any foreign national as an illegal immigrant and deport them.

• The Act also provided for powers to arrest, detain, or restrict the movement of foreigners under certain circumstances.

• Immigration Challenges in India:

• India faces significant immigration challenges, including illegal migration across porous borders with neighboring countries like Bangladesh and Myanmar.

• The lack of a modern and unified immigration framework has hindered efficient regulation and monitoring of foreign nationals.

• Key Features of the Immigration and Foreigners Bill, 2025:

• Introduces a centralized database for monitoring the entry and exit of foreign nationals.

• Enhances penalties for violation of immigration laws.

• Establishes dedicated immigration courts to expedite the resolution of disputes and deportation cases.

• Related Legislation:

• The Emigration Act, 1983, governs the emigration of Indian nationals for overseas employment and remains unaffected by the new bill.

• The Citizenship Act, 1955, deals with the acquisition and termination of Indian citizenship and is also separate from the Immigration and Foreigners Bill.

Q81. Answer: (c) -5

Given number: (Left) 412 366 307 241 667 (Right)

According to the question,

Number given	412	366	307	241	667
Arranged in ascending order	241	307	366	412	667

First digit of the highest number → 667 → 6

Third digit of the lowest number → 241 → 1

So, the first digit of the highest number is subtracted from the third digit of the lowest number → (1 - 6) = -5

Hence, "Option 3" is the correct answer.

Q82. Answer: (a) Adivaraha

The correct answer is Adivaraha.

Key Points

• Mihira Bhoja, one of the most notable rulers of the Pratihara dynasty, adopted the title Adivaraha, which symbolized his association with Lord Vishnu's Varaha (boar) incarnation.

• The title "Adivaraha" reflects the ruler's dedication to Vaishnavism, which was a significant aspect of his reign.

• Mihira Bhoja was known for strengthening the Pratihara dynasty's power and expanding its territorial reach during the 9th century CE.

• His reign is marked by significant advancements in administration, military organization, and cultural development under the Pratiharas.

• The use of the title "Adivaraha" was also an assertion of divine legitimacy and authority over his kingdom.

Additional Information

• Pratihara Dynasty:

• The Gurjara-Pratihara dynasty was one of the three main powers of early medieval India, alongside the Palas and Rashtrakutas.

• Their empire extended over northern and western India, and they were known for their resistance to Arab invasions.

• Vaishnavism:

• A major tradition within Hinduism that worships Vishnu and his avatars, such as Rama and Krishna, as the supreme deities.

• It played a significant role in shaping the religious and cultural practices of medieval India.

• Varaha Avatar:

• Varaha is the third avatar of Vishnu, depicted as a boar that rescued the Earth (personified as the goddess Bhudevi) from the demon Hiranyaksha.

• This avatar signifies the triumph of good over evil and the restoration of cosmic order (dharma).

• Mihira Bhoja's Legacy:
• He is celebrated for his military conquests and efficient administration.
• His empire acted as a crucial cultural and political bridge between different regions of India during his rule.

Q83. Answer: (a) 207

Shortcut Trick
In a mean proportion $b^2 = a \times c$.
Here, $276^2 = x \times 368$.
$x = (276 \times 276) \div 368$.
$x = (3 \times 92 \times 276) \div (4 \times 92) = (3 \times 276) \div 4 = 3 \times 69 = 207$.
Therefore The correct answer is 207.
Alternate Method
Given:
Mean proportion (b) = 276
One number (c) = 368
Other number = x
Formula Used:
If b is the mean proportion between a and c, then a : b = b : c or $b = \sqrt{(a \times c)}$.
Calculations:
=> $276 = \sqrt{(x \times 368)}$
=> $276^2 = x \times 368$
=> $76176 = x \times 368$
=> $x = 76176 \div 368$
=> $x = 207$
Therefore The correct answer is 207.
Additional Information
Third Proportional
If a : b = b : c, then c is called the third proportional to a and b, where $c = b^2 \div a$.
Fourth Proportional
If a : b = c : d, then d is the fourth proportional, calculated as $d = (b \times c) \div a$.
Invertendo and Alternendo
If a/b = c/d, then Invertendo is b/a = d/c and Alternendo is a/c = b/d.

Q84. Answer: (c) 60

Shortcut Trick
Let Total Capacity of the tank be LCM(9, 10) = 90 units.
Efficiency of Pipe A = 90 ÷ 9 = 10 units/min (Filling).
Efficiency of Pipe B = 90 ÷ 10 = −9 units/min (Emptying).
Work done by Pipe A in first 3 minutes = 10 × 3 = 30 units.
Remaining work = 90 − 30 = 60 units.
Combined efficiency (A + B) = 10 − 9 = 1 unit/min.
Remaining time = 60 ÷ 1 = 60 minutes.
Therefore The correct answer is 60 minutes.
Alternate Method
Given: Filling time of Pipe A = 9 mins; Emptying time of Pipe B = 10 mins; A works alone for 3 mins.
Formula Used: Total Work = Efficiency × Time; Net Efficiency = Filling Efficiency − Emptying Efficiency.

Person	Days	Total Work	Efficiency
Pipe A	9	90	10
Pipe B	10	−9	

=> Work completed by Pipe A in 3 mins = 10 × 3 = 30 units
=> Remaining Capacity = 90 − 30 = 60 units

=> Combined Efficiency of (A + B) = 10 + (−9) = 1 unit/min
=> Time to fill remaining tank = Remaining Capacity ÷ Net Efficiency
=> Time = 60 ÷ 1 = 60 minutes
Therefore The correct answer is 60 minutes.
Additional Information
Pipes and Cisterns Sign Convention
Always take the efficiency of a filling pipe as positive (+) and an emptying pipe (leakage) as negative (−).
Net Efficiency Formula
If pipe A fills in 'x' hours and pipe B empties in 'y' hours, the part filled in 1 hour while both are open is (1/x − 1/y).
Total Capacity Calculation
The easiest way to find the tank capacity is to calculate the Least Common Multiple (LCM) of the individual times given.

Q85. Answer: (a) Pipelining

The correct answer is Pipelining.
Key Points
• Pipelining is a technique used in modern CPUs to execute multiple instructions simultaneously by dividing them into stages.
• Each stage of the pipeline performs a specific operation (e.g., fetch, decode, execute, etc.) to process instructions concurrently.
• Pipelining improves the instruction throughput, allowing the CPU to complete more instructions per unit time.
• The technique is widely used in RISC (Reduced Instruction Set Computer) architectures for enhanced performance.
• Pipeline efficiency depends on factors like branch prediction, data hazards, and instruction dependencies.
Additional Information
• Clock Synchronization:
• Ensures all parts of a CPU operate in sync with the system clock.
• It does not execute multiple instructions simultaneously but coordinates timing between processes.
• Sequential Execution:
• A traditional processing method where instructions are executed one after the other.
• This method contrasts with parallel execution techniques like pipelining.
• Hazards in Pipelining:
• Data Hazards: Occur when instructions depend on the results of previous ones.
• Control Hazards: Arise due to branch instructions affecting the flow of execution.
• Structural Hazards: Result from resource conflicts within the pipeline.
• Parallel Processing vs Pipelining:
• Parallel processing uses multiple processors to execute tasks simultaneously.
• Pipelining divides a single processor's tasks into stages for concurrent execution.

Q86. Answer: (b) 6

According to the given information,
Thus, 'P' is coded as '6'.
Hence, "Option 2" is the correct answer.

Q87. Answer: (a) 61^(st)

Given:
1) In a row of 81 students facing north, Sima is 12th from the right end.
2) Manju is 9th to the left of Sima.
Total students = 81
Sima's rank from the right end = 12th
Manju's rank from the right end = 12 + 9 → 21^(st)
Manju's rank from the left end = Total students - Manju's rank from the right end + 1
= 81 - 21 + 1
= 61
Hence, "Option 1" is the correct answer.

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Q88. Answer: (c) 25%

Shortcut Trick

When a sum doubles itself, the Simple Interest becomes equal to the Principal (100%).

Shortcut formula: Rate (R) = 100 ÷ Time (T)

=> R = 100 ÷ 4

=> R = 25%

Therefore The correct answer is 25%.

Alternate Method

Given:

Let the Principal (P) be Rs. 100.

The Amount (A) becomes double = 2 × 100 = Rs. 200.

Time (T) = 4 years.

Formula Used:

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

Amount (A) = Principal (P) + Simple Interest (SI)

Calculations:

=> SI = A − P = 200 − 100 = Rs. 100

=> 100 = (100 × R × 4) ÷ 100

=> 100 = R × 4

=> R = 100 ÷ 4

=> R = 25%

Therefore The correct answer is 25%.

Additional Information

General Formula for 'n' times

If a sum of money becomes n times of itself in T years at SI, then R = (n − 1) × 100 ÷ T.

Compound Interest Doubling (Rule of 72)

In Compound Interest, the approximate time to double money is T ≈ 72 ÷ R.

Simple Interest vs Amount

SI is calculated only on the Principal, whereas the Amount grows linearly in SI: A = P(1 + RT/100).

Q89. Answer: (a) Article 19

The correct answer is Article 19.

Key Points

• Article 19(1)(e) of the Constitution of India provides citizens the fundamental right to reside and settle in any part of the territory of India.

• This right is subject to reasonable restrictions imposed by the State in the interest of the general public or for the protection of Scheduled Tribes.

• It ensures freedom of movement and residence across the country to promote national unity and integration.

• The provision is part of the broader framework of Fundamental Rights enshrined in Part III of the Indian Constitution.

• Reasonable restrictions under Article 19(5) may include measures for protecting indigenous tribal populations and maintaining public order.

Additional Information

• Fundamental Rights:

• Fundamental Rights are guaranteed under Part III of the Indian Constitution.

• They are enforceable by courts and are aimed at ensuring political and civil freedoms.

• Rights under Article 19 include freedom of speech, assembly, association, movement, residence, and profession.

• Reasonable Restrictions:

• Rights under Article 19 are not absolute and can be restricted under Article 19(2) to 19(6).

• Restrictions are meant to safeguard public order, sovereignty, morality, and the interests of Scheduled Tribes.

• Scheduled Tribes Protection:

• Specific laws like the Fifth and Sixth Schedules of the Constitution protect tribal areas and their autonomy.

• These laws aim to preserve the cultural and economic interests of indigenous tribal populations.

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• Constitutional Amendments:

• Amendments to Fundamental Rights require adherence to Article 368 of the Constitution.

• The judiciary plays a key role in interpreting these rights and ensuring they are not diluted arbitrarily.

Q90. Answer: (a) (2x + 3y - 4z)

Shortcut Trick

Recognize the expression follows the algebraic identity form: $(a^3 + b^3 + c^3 - 3abc) \div (a^2 + b^2 + c^2 - ab - bc - ca)$.

This identity simplifies directly to (a + b + c).

Here, a = 2x, b = 3y, and c = −4z.

Substitute the values: (2x) + (3y) + (−4z) = 2x + 3y − 4z.

Therefore The correct answer is (2x + 3y − 4z).

Alternate Method

Given: $(8x^3 + 27y^3 - 64z^3 + 72xyz) \div (4x^2 + 9y^2 + 16z^2 - 6xy + 12yz + 8zx)$

Formula Used: $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

=> Let a = 2x, b = 3y, and c = −4z.

=> Numerator: $(2x)^3 + (3y)^3 + (-4z)^3 - 3(2x)(3y)(-4z) = 8x^3 + 27y^3 - 64z^3 + 72xyz$.

=> Denominator: $(2x)^2 + (3y)^2 + (-4z)^2 - (2x)(3y) - (3y)(-4z) - (-4z)(2x) = 4x^2 + 9y^2 + 16z^2 - 6xy + 12yz + 8zx$.

=> Using the identity: Numerator ÷ Denominator = (a + b + c).

=> Simplified Value = 2x + 3y + (−4z) = 2x + 3y − 4z.

Therefore The correct answer is (2x + 3y − 4z).

Additional Information

The Conditional Identity

If (a + b + c) = 0, then $a^3 + b^3 + c^3 = 3abc$. This is a common variation used in exams.

Alternative Form of Identity

$a^3 + b^3 + c^3 - 3abc = 1/2(a + b + c)[(a - b)^2 + (b - c)^2 + (c - a)^2]$.

BODMAS Rule

Always perform operations inside Brackets first, followed by Orders, Division, Multiplication, Addition, and Subtraction.

Q91. Answer: (a) Emergent coast

The correct answer is Emergent coast.

Key Points

• The Eastern Coastal Plains of India are classified as an emergent coast, which means they have been formed due to the gradual upliftment of land or a fall in sea level.

• These plains stretch along the eastern edge of India, covering states like Odisha, Andhra Pradesh, Tamil Nadu, and parts of West Bengal.

• The region is marked by extensive deltas formed by rivers like the Mahanadi, Godavari, Krishna, and Kaveri, which contribute to the fertile soil.

• Emergent coasts are characterized by features such as wide plains, lagoons, backwaters, and riverine estuaries, which are prominent along India's Eastern Coastal Plains.

• These plains are generally flat and low-lying, making them suitable for agriculture and settlement.

Additional Information

• Emergent Coast:

• An emergent coast forms due to tectonic uplift or a drop in sea level, exposing previously submerged areas.

• Such coasts often feature raised beaches, marine terraces, and expansive plains.

• India's Eastern Coastal Plains are an example, showcasing deltaic formations and fertile lands.

• Submerged Coast:

• Formed due to rising sea levels or subsidence of land, resulting in features such as bays, fjords, and estuaries.

• India's Western Coastal Plains exhibit characteristics of a partially submerged coast.

• River Deltas:

• Rivers like the Mahanadi, Godavari, Krishna, and Kaveri contribute to the formation of fertile deltas along the Eastern Coastal Plains.

• These deltas are vital for agriculture and host biodiversity-rich ecosystems.

• Coastal Importance in India:

• The Eastern Coastal Plains are crucial for agriculture, fishing, and port-based trade.

• Prominent cities like Chennai, Visakhapatnam, and Kolkata are located along this coast.

Q92. Answer: (b) ST -9

The logic followed here is:

XC 14 is related to VG 1

And,

RD 18 is related to PH 5

Similarly,

UP 4 is related to

Hence, "Option 2" is the correct answer.

Q93. Answer: (c) 19%

Shortcut Trick

Net change formula for percentage profit: Successive percentage = a + b + (a × b) ÷ 100

Here, markup percentage (a) = +40% and discount percentage (b) = −15%.

Profit% = 40 − 15 + (40 × (−15)) ÷ 100

Profit% = 25 − 600 ÷ 100 = 25 − 6 = 19%.

Note: The actual cost price (Rs. 8,100) is redundant when calculating percentage profit.

Therefore The correct answer is 19%.

Alternate Method

Given → Cost Price (CP) = Rs. 8,100, Markup% = 40%, Discount% = 15%.

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

=> Marked Price (MP) = 8100 × (140 ÷ 100) = 81 × 140 = Rs. 11,340.

=> Selling Price (SP) = 11340 × (85 ÷ 100) = 113.4 × 85 = Rs. 9,639.

=> Profit = 9639 − 8100 = Rs. 1,539.

=> Profit% = (1539 ÷ 8100) × 100 = 1539 ÷ 81 = 19%.

Therefore The correct answer is 19%.

Additional Information

Marked Price & Discount

The Marked Price (MP) is the price printed on the article. Discount is always calculated on the MP to arrive at the Selling Price (SP).

Relationship Formula

A direct relationship exists between MP and CP: MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%).

Q94. Answer: (b) 76.4%

The correct answer is 76.4%.

Key Points

• The labour force participation rate (LFPR) is defined as the percentage of people in the labour force (employed + unemployed) within the working-age population.

• According to the 6th Annual Employment-Unemployment Survey (2016) conducted by the Labour Bureau, the LFPR for males in India was reported to be 76.4%.

• The survey highlighted distinct gender disparities in LFPR, with male participation being significantly higher than female participation.

• The LFPR for males has traditionally been higher due to cultural, economic, and social factors influencing workforce participation in India.

• The survey serves as a critical tool for analyzing employment trends and policy planning to improve labour market outcomes.

Additional Information

• Labour Force Participation Rate (LFPR):

• LFPR measures the proportion of the working-age population (15 years and above) that is actively engaged in the labour market, either employed or seeking employment.

• It is a vital indicator of the economy's active workforce and economic activity levels.

• 6th Annual Employment-Unemployment Survey:

• Conducted by the Labour Bureau, the survey provides insights into employment, unemployment, and labour force trends in India.

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• The survey includes metrics such as LFPR, Worker Population Ratio (WPR), and Unemployment Rate (UR).
• Gender Disparities in LFPR:
• India has one of the lowest female LFPRs globally, attributed to factors like socio-cultural norms, lack of opportunities, and safety concerns.
• Efforts such as skill development and women-centric employment policies aim to improve female labour participation.
• Policy Implications:
• Data from employment surveys inform policymakers to address unemployment and improve workforce engagement.
• Programs like Skill India and Make in India aim to enhance job opportunities and labour force participation.

Q95. Answer: (c) Rs. 11,979

Shortcut Trick
For half-yearly compounding at 20% per annum, the half-yearly rate is 10%.
Net effective interest rate for 2 half-years = 10 + 10 + (10 × 10) ÷ 100 = 21%.
Total Amount = 121% of Principal.
Amount = 9900 × 1.21 = 11979.
Therefore The correct answer is Rs. 11,979.
Alternate Method
Given:
Principal (P) = Rs. 9,900
Rate (R) = 20% p.a.
Time (T) = 1 year
Formula used:
For half-yearly compounding, Rate (r) = R/2 and Time (n) = 2T
Amount (A) = $P \times (1 + r/100)^n$
Calculations:
=> Adjusted Rate (r) = 20 ÷ 2 = 10% per half-year
=> Adjusted Time (n) = 1 × 2 = 2 half-years
=> $A = 9900 \times (1 + 10/100)^2$
=> $A = 9900 \times (11/10)^2$
=> A = 9900 × (121 ÷ 100)
=> A = 99 × 121
=> A = 11979
Therefore The correct answer is Rs. 11,979.
Additional Information
Compounding Frequency Rules
When interest is compounded quarterly, the rate becomes R/4 and the time periods become 4T.
Compound Interest vs Simple Interest
For the first conversion period, SI and CI are equal. The difference for 2 periods is $P(R/100)^2$.
Effective Rate Formula
The effective annual rate (EAR) is given by $(1 + r/n)^n - 1$, where n is the number of compounding periods.

Q96. Answer: (b) 6

According to the given information,
Thus, 'C' is coded as '6'.
Hence, "Option 2" is the correct answer.

Q97. Answer: (b) 16

Given number: 415796
According to the question,

Number given	4	1	5	7	9	6
Odd digit → (-1) Even digit → (+2)	(+2)	(-1)	(-1)	(-1)	(-1)	(+2)

Resultant number	6	0	4	6	8	8

So, sum of the digits which are fifth from the left and first from the right in the new number thus formed → 6 0 4 6 8 8 → (8 + 8) = 16

Hence, "Option 2" is the correct answer.

Q98. Answer: (d) 25-29

The correct answer is 25-29.

Key Points

• According to the 6th Annual Employment-Unemployment Survey conducted by the Labour Bureau, the age group 25-29 years had the highest participation in the labour force in India.

• This survey highlights labour force participation trends across various age groups, aiming to understand India's workforce dynamics.

• The labour force participation rate (LFPR) measures the proportion of the working-age population actively engaged in the labour market, either employed or seeking employment.

• The 25-29 age group represents individuals often transitioning into stable employment after completing education and gaining initial work experience.

• These trends are critical for policymakers to address employment generation strategies and skill development initiatives.

Additional Information

• Labour Force Participation Rate (LFPR):

• LFPR is a key economic indicator representing the percentage of the working-age population that is either employed or actively seeking employment.

• In India, LFPR has historically been lower compared to global averages, particularly for women.

• Unemployment Rate:

• The unemployment rate indicates the percentage of the labour force that is without work but actively seeking employment.

• It is a crucial metric for assessing the health of the economy and the effectiveness of employment policies.

• 6th Annual Employment-Unemployment Survey:

• Conducted by India's Labour Bureau, this survey provides insights into employment trends and labour force dynamics.

• It categorizes data across sectors, age groups, gender, and regions to assist in informed policymaking.

• Skill Development Initiatives:

• Government schemes like Skill India aim to enhance employability by providing vocational training and skill development.

• Such initiatives help bridge the gap between workforce needs and available skills in the labour market.

Q99. Answer: (c) 120/119

Shortcut Trick

Product of LCM and HCF = Product of the two numbers.

Product of numbers = 119. Let numbers be 17x and 7x.

=> 17x × 7x = 119 => 119x^2 = 119 => x = 1. So numbers are 17 and 7.

Sum of reciprocals = (LCM + HCF) / (LCM × HCF). Since LCM of 17, 7 is 119 and HCF is 1.

Sum = (119 + 1) / 119 = 120/119.

Therefore The correct answer is 120/119.

Alternate Method

Given: Ratio of numbers = 17 : 7, Product of LCM and HCF = 119.

Formula Used: Product of two numbers = LCM × HCF

=> Let the numbers be 17x and 7x.

=> Product = 17x × 7x = 119x^2.

=> 119x^2 = 119 => x^2 = 1 => x = 1.

=> The numbers are 17 and 7.

=> HCF of (17, 7) = 1 (as they are co-prime).

=> LCM of (17, 7) = 17 × 7 = 119.

=> Sum of reciprocals = 1/119 + 1/1 = (1 + 119) / 119 = 120/119.

Therefore The correct answer is 120/119.

Additional Information

Fundamental Property of HCF and LCM

For any two positive integers a and b, HCF(a, b) × LCM(a, b) = a × b.

Co-prime Numbers

Two numbers are co-prime if their HCF is 1. For co-prime numbers, LCM is always their product.

Reciprocal Sum Rule

The sum of reciprocals of two values X and Y is given by (X + Y) / (X × Y).

Q100. Answer: (c) XZ - TL

The logic followed here is:

Option 1) NR - MQ

Option 2) EI - DH

Option 3) XZ - TL

Option 4) RV - QU

Thus, out of all the options 'XZ - TL' is the odd one.

Hence, "Option 3" is the correct answer.

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