RRB NTPC Graduate Level CBT-I Official Paper (Held On: 13 Jun, 2025 Shift 1) (Previous Year Paper)

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

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Q1. In a certain code language,

'A + B' means 'A is the sister of B'

'A – B' means 'A is the brother of B'

'A × B' means 'A is the wife of B'

'A ÷ B' means 'A is the father of B'

Based on the above, how is M related to Q if 'M ÷ N – O + P × Q'?

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

Q2. India adopted a policy of Import Substitution Industrialisation (ISI) after independence. Which of the following was a common limitation faced by ISI-led strategy by the 1980s?

(a) Lack of consumer demand
(b) Technological backwardness
(c) Shortage of skilled labour
(d) Excessive exports

Q3. Rudradaman, who ruled in the middle of second century AD territories of Mathura and Gujarat belonged to which dynasty?

(a) Shaka
(b) Pala
(c) Pahlavas
(d) Shunga

Q4. The compound interest earned in 1 year on Rs. 2,40,000 at the rate of 40% per annum, compounded quarterly, is:

(a) Rs. 1,11,384
(b) Rs. 1,12,269
(c) Rs. 1,12,281
(d) Rs. 1,10,519

Q5. Uninterrupted and seamless chain of Input Tax Credit (ITC) is a mechanism to avoid cascading of taxes in which of the following taxes?

(a) GST
(b) Angel tax
(c) Equalisation levy
(d) Countervailing duty

Q6. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 3762184, what will be the sum of the highest and lowest digits in the number thus formed?

(a) 8
(b) 7

(c) 6
(d) 9

Q7. Read the given statements and conclusions carefully. Assuming that the informationgiven 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 bikes are roads.
Some roads are TVs.
Some TVs are cups.
Conclusions:
(I) All roads are bikes.
(II) All roads are TVs.
(a) Only conclusion (II) follows
(b) Both conclusion (I) and (II) follow
(c) Only conclusion (I) follows
(d) Neither conclusion (I) nor (II) follows

Q8. Which of the following statements is correct with reference to the industrial use of freon?
(a) It is used in refrigeration and aerosol production.
(b) It is primarily used in food processing and as a food preservative
(c) It is used as a pesticide and insecticide.
(d) It is used for textile dyeing.

Q9. Rituraj starts from Point A and drives 11 km towards South. He then takes a right turn, drives 9 km, turns right and drives 12 km. He then takes a right turn and drives 12 km. He takes a final right turn, drives 1 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) 3 km to the west
(b) 4 km to the west
(c) 2 km to the west
(d) 1 km to the west

Q10. Find the value of 'c' so that the quadratic equation $2x^2 - 3x + c = 0$ and $x^2 - 9x - 22 = 0$ may have one common root 11.
(a) -237
(b) -157
(c) -107
(d) -209

Q11. G, H, I, J, K and X live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6. K lives on an odd numbered floor but not on the lowermost floor. Only two people live between K and G. Only two people live between I and H. X lives immediately below K. No one lives above I. How many people live between J and X?
(a) Three
(b) Two
(c) Four
(d) One

Q12. What is the NISAR satellite, launched in February 2025 and co-developed by ISRO and NASA, designed for?
(a) Deep space communication
(b) Planetary exploration
(c) Earth observation and climate monitoring

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(d) Solar flare detection

Q13. If the average of four numbers is 40 and three of the numbers among four are 40, 42 and 55, what will be the fourth number?

(a) 21
(b) 27
(c) 29
(d) 23

Q14. In a certain code language, ‘smooth long drive’ is coded as ‘zi ma tu’ and ‘challenging mountain drive’ is coded as ‘fo se zi’. How is ‘drive’ coded in the given language?

(a) ma
(b) zi
(c) fo
(d) se

Q15. Simplify: √0.012321/√0.001369

(a) 16
(b) 18
(c) 3
(d) 23

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

405 ÷ 2 + 369 × 9 − 32 = ?

(a) 803
(b) 801
(c) 804
(d) 802

Q17. A swimmer can swim downstream at 40 km/hr and upstream at 26 km/hr. What is the speed of the swimmer in still water?

(a) 42 km/h
(b) 26 km/hr
(c) 33 km/hr
(d) 40 km/hr

Q18. What should come in place of the question mark (?) in the given series?

46 55 78 87 110 119 ?

(a) 137
(b) 128
(c) 150
(d) 142

Q19. A conical vessel has base radius 6 cm and height 20 cm. Water is poured into the vessel until it is 3/4 full. Find the volume (in cm^3) of water in the vessel.

(a) 184π
(b) 171π
(c) 180π
(d) 187π

Q20. The mode of the observations 9, 6, 4, 2, 5, 2, 9, 2, 1, 9, 4, 5, 9, 5, 4 and 8 is:

(a) 4
(b) 2
(c) 6

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(d) 9

Q21. When was municipal governance first introduced in British India?

(a) 1687
(b) 1850
(c) 1882
(d) 1919

Q22. Under the SVAMITVA scheme, which modern technology is used to map land ownership in rural India?

(a) Drone Surveying
(b) Blockchain
(c) Artificial Intelligence
(d) Satellite Radar Imaging

Q23. The marked price of a smartwatch set is Rs. 640. It sells with two successive discounts of 30% and 25%. An additional 25% discount is given on cash payment. What is the selling price (in Rs.) of the smartwatch set on cash payment?

(a) 253
(b) 251
(c) 249
(d) 252

Q24. Which characteristic of the CPU determines how many instructions it can process per second?

(a) Cache size
(b) Clock speed
(c) Number of registers
(d) Power consumption

Q25. The sum of three numbers x, y and z is 12 and their squares sum is 20. What will be the value of $x^3 + y^3 + z^3 - 3xyz$?

(a) -504
(b) -305
(c) 504
(d) 305

Q26. Seven boxes, A, B, C, D, E, F and G, are kept one above the other but not necessarily in the same order. Only two boxes are kept below C. Only one box is kept above A. Only one box is kept between A and E. B is kept immediately above F. D is kept at some place below G. How many boxes are kept above B?

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

Q27. Manjit has borrowed an amount of Rs. 2,20,000 from a bank to start a business. How much simple interest (in Rs.) will he pay at a rate of 4% per annum after 2 years?

(a) 2,37,600
(b) 16,600
(c) 18,600
(d) 17,600

Q28. What were ‘privy purses’?

(a) Loans from British government
(b) Pensions paid to the princes after integration
(c) Travel allowances for royal families
(d) Royal taxes

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Q29. The value of 49 + [7 + {63 - (27 ÷ 9)} ÷ 6] is:

(a) 66
(b) 76
(c) 63
(d) 74

Q30. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 3 € & £ @ * # 1 $ € @ © € © & 1 € 4 1 2 4 © (Right)

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

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

Q31. Which global observance did UNESCO mark on 24 January 2025?

(a) World Science Day
(b) International Day of Peace
(c) International Day of Education
(d) World Heritage Day

Q32. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

DK26, GN33, JQ40, MT47, ?

(a) PW54
(b) PV54
(c) PW53
(d) PV53

Q33. Most of the Thar desert lies within India, spanning the states of _____

(a) Rajasthan, Gujarat, Punjab, and Uttar Pradesh
(b) Rajasthan, Gujarat, Punjab, and Haryana
(c) Rajasthan, Gujarat, Punjab, and Madhya Pradesh
(d) Rajasthan, Gujarat, Punjab, and Himachal Pradesh

Q34. Which canal project plays a major role in irrigation in the Thar Desert?

(a) Sardar Sarovar Canal
(b) Yamuna Canal
(c) Tehri Canal
(d) Indira Gandhi Canal

Q35. A tap fills a cistern in 18 hours. Another tap empties the full tank in 19 hours. How long (in hours) will it take to fill one-third of the tank, if the tank is empty initially and both the taps are open together?

(a) 456
(b) 114
(c) 342
(d) 228

Q36. What kind of architectural style is seen in the shikharas of the Jageshwar temple complexes in Uttarakhand, India?

(a) Pyramidal towers
(b) Flat brick shikharas
(c) Curvilinear shikharas
(d) Buddhist stupas

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Q37. _____ recorded the highest population density in 2011, as per the 2011 Census of India.

(a) North East Delhi
(b) Mumbai Sub-Urban
(c) Hyderabad
(d) Chennai

Q38. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

SW-NR-IM

IM-DH-YC

(a) UY-PT-LO
(b) FJ-AE-WZ
(c) YC-TX-OS
(d) HL-DG-XB

Q39. In many Windows applications, pressing Alt + Spacebar typically invokes which of the following?

(a) The 'Run' dialog box
(b) The system menu for the current window (containing options like Move, Size, Minimize, Maximize, Close)
(c) The application's main menu bar
(d) The Task Manager

Q40. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

OL-QN-SU

LI-NK-PR

(a) RO-TQ-VY
(b) SO-TR-VY
(c) SO-TQ-VY
(d) RO-TQ-VX

Q41. Rohan starts from point A and drives 8 km towards the north. He then takes a left turn, drives 12 km, turns left and drives 11 km. He then takes a left turn and drives 14 km. He takes a final left turn, drives 3 km and stops at point P. How far (shortest distance) and towards which direction should he drive in order to reach point A again? (All turns are 90-degree turns only unless specified.)

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

Q42. In March 2025, what ranking did Deepti Sharma achieve in the ICC Women's all rounders rankings?

(a) 5^(th)
(b) 3^(rd)
(c) 4^(th)
(d) 6^(th)

Q43. The sum of five numbers is 655. The average of the first two numbers is 77 and the third number is 129. Find the average of the remaining two numbers.

(a) 186
(b) 205
(c) 207
(d) 187

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Q44. The cost of 6 pens and 5 pencils is Rs. 259. If the cost of a pen decreases by Rs. 9 and the cost of a pencil increases by Rs. 4, then the cost of 19 pens and 2 pencils is Rs. 90. What is the original cost of 13 pens and 2 pencils?

(a) Rs. 197
(b) Rs. 199
(c) Rs. 202
(d) Rs. 195

Q45. The Mahalwari system was prevalent in certain regions of northern and central India. From whom was the land revenue collected under the Mahalwari system?

(a) Religious institutions
(b) Village head
(c) Landlords
(d) Individual peasants

Q46. Which of the following key centres of the 1857 Revolt was recaptured from the rebel forces in September 1857?

(a) Bombay
(b) Delhi
(c) Surat
(d) Madras

Q47. If the third proportional of 36 and Z is 4, then what is the positive value of Z?

(a) 17
(b) 9
(c) 12
(d) 11

Q48. Simplify the following: 2/8 + 2/8 + 1/16 + 2/8 - 1

(a) 4/16
(b) -3/16
(c) • 8/16
(d) 1/16

Q49. If 25% of k is 10 less than 1800% of 10, then k is:

(a) 720
(b) 640
(c) 680
(d) 660

Q50. Which of the following ratios is greatest?

(a) 17 : 53
(b) 24 : 54
(c) 28 : 60
(d) 16 : 57

Q51. In the context of managing multiple open applications within a graphical operating system, what is the typical behaviour initiated by pressing Ctrl + Tab?

(a) It cycles through the open windows or tabs of the currently active application
(b) It opens a new tab or window within the currently active application.
(c) It closes the currently active application window
(d) It minimises the currently active application window to the taskbar or dock.

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Q52. The Chotanagpur Plateau is drained by which river system?

(a) Tapi
(b) Damodar
(c) Krishna
(d) Godavari

Q53. Who among the following did Pankaj Advani defeat in the final of the 2025 Asian Snooker Championship?

(a) Ahsan Ramzan
(b) Habib Shalaby
(c) Amir Sarkosh
(d) Mohsen Bukshaisha

Q54. Which country ranked fourth in the Human Development Report 2025?

(a) Lebanon
(b) Denmark
(c) Zimbabwe
(d) Sierra Leone

Q55. If the mode of the following data is 165, then what is the value of x?

Class	150-155	155-160	160-165	165-170	170-175
Frequency	13	26	37	x	27

(a) 54
(b) 27
(c) 57
(d) 37

Q56. Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number results in the second number. Similarly, certain mathematical operation(s) on the second number results in the third number and so on. Which of the given options follows the same set of operations as in the given sets? (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding / subtracting / multiplying to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

6 - 12 - 15 - 30;

4 - 8 - 11 - 22

(a) 8 - 16 - 19 - 36
(b) 12 - 14 - 28 - 30
(c) 1 - 2 - 4 - 16
(d) 11 - 22 - 25 - 50

Q57. A can complete a piece of work in 14 days and B can complete it in 10 days. If they work on alternate days, starting with B on the first day, then in how many days will the work be finished?

(a) 11 2/3
(b) 10 2/3
(c) 11 3/5
(d) 10 3/5

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

89 ÷ 4984 – 89 × 9 + 2 = ?

(a) 15
(b) 51
(c) 55
(d) 92

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Q59. The percentage profit earned by selling an article for Rs. 6,833 is equal to the percentage loss incurred by selling the same article for Rs. 1,447. At what price should the article be sold (in Rs.) to make a 45% profit?

(a) 6,003
(b) 6,002
(c) 6,001
(d) 6,005

Q60. On 4 April 2025, which bank of India has launched a verified WhatsApp channel for Financial Updates?

(a) Reserve Bank of India
(b) State Bank of India
(c) Axis Bank
(d) Bank of Baroda

Q61. Three numbers are in the ratio 1 : 15 : 7, and their LCM is 4830. Their HCF is:

(a) 41
(b) 46
(c) 43
(d) 49

Q62. A, B, C, D, G, H and I are sitting around a circular table facing the centre of the table. Only three people sit between I and H when counted from the left of I. Only three people sit between A and G when counted from the right of G. C sits to the immediate right of A. B is an immediate neighbour of G as well as H. Who sits to the second to the left of D?

(a) G
(b) A
(c) I
(d) B

Q63. At Aero India 2025, the DRDO unveiled a new technology to enhance aircraft launch capabilities for the Indian Navy. What is this technology called?

(a) Integrated Launch Assist System (ILAS)
(b) Electro-Magnetic Launch System (EMLS)
(c) Magnetic Aircraft Launch System (MALS)
(d) Advanced Catapult Launch Mechanism (ACLM)

Q64. What is the function of subsidiary cells?

(a) Absorption of light for photosynthesis
(b) Support of guard cells in stomatal function
(c) Secretion of enzymes for nutrient acquisition, defence and digestion
(d) Transport of food through phloem

Q65. Who won Best Directorial Debut for 'Madgaon Express' at IIFA Awards, 2025?

(a) Kiran Rao
(b) Biplab Goswami
(c) Sriram Raghavan
(d) Kunal Kemmu

Q66. JKL is related to KMO in a certain way based on the English alphabetical order. In the same way, PQR is related to QSU. To which of the following is XYZ related, following the same logic?

(a) FED
(b) ABC
(c) YAC
(d) YZA

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Q67. A gas stove flame burns blue because of:

(a) Complete combustion of fuel
(b) Presence of hydrogen in the air
(c) Hazardous combustion
(d) Insufficient oxygen

Q68. The revolt of 1857 broke out on 10^(th) May from which of the following places, when sepoys rose in rebellion and marched towards Delhi to restore Bahadur Shah II to the throne?

(a) Awadh
(b) Meerut
(c) Kanpur
(d) Mysore

Q69. Since December 2022, the functions of the National Anti-Profiteering Authority established in association with GST reforms have been transferred to which body in India?

(a) Directorate General of Trade Remedies
(b) NITI Aayog
(c) Reserve Bank of India
(d) Competition Commission

Q70. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

NK-RO-VX

LI-PM-TV

(a) IG-NL-RU
(b) IG-NK-RU
(c) JG-NK-RT
(d) JG-NK-RU

Q71. A person standing 30 metres away from a tower observes the angle of elevation to the top of the tower as 30°. Find the height of the tower.

(a) 30 meter
(b) 30 √3 meter
(c) 10 √3 meter
(d) 10_(√2)meter

Q72. Which of these agricultural regions is best known for rice-wheat cropping system?

(a) Western India
(b) Indo-Gangetic Plains
(c) Deccan Plateau
(d) Eastern Coastal Plains

Q73. Which country did PM Narendra Modi visit in March 2025 to attend its 57^(th) National Day celebrations?

(a) Fiji
(b) Mauritius
(c) Seychelles
(d) Maldives

Q74. 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) AWRP
(b) JFAY
(c) HDVW
(d) RNIG

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Q75. According to the 73^(rd)Constitutional Amendment Act, 1992, which body functions as the foundation of the Panchayati Raj system, ensuring broad-based community participation?

(a) Zila Parishad
(b) Gram Sabha
(c) Gram Panchayat
(d) Nyaya Panchayat

Q76. Which element on the Windows 11 desktop allows users to quickly access multiple open windows and virtual desktops?

(a) Task View
(b) Control Panel
(c) Start Menu
(d) File Explorer

Q77. For a regular polygon, the sum of the interior angles is 100% more than the sum of its exterior angles. Each interior angle of the polygon measures x°. What is the value of x?

(a) 140
(b) 100
(c) 125
(d) 120

Q78. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 8 * * € 6 % 3 2 $ # 9 9 9 2 @ # 5 3 % 9 @ 1 (Right)

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

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

Q79. In a certain code language, ‘GIVE’ is coded as ‘6482’ and ‘VOLT’ is coded as ‘3671’. What is the code for ‘V’ in the given code language?

(a) 7
(b) 3
(c) 8
(d) 6

Q80. A, B, C, D, E, F and G are sitting around a circular table facing the centre. D sits third to the right of C. A sits second to the right of B. B is not an immediate neighbour of C. G sits to the immediate right of F. C sits to the immediate left of F. How many people sit between G and E when counted from the left of G?

(a) Two
(b) One
(c) Three
(d) None

Q81. How many religious communities are covered under the 2019 Citizenship Amendment Act?

(a) 5
(b) 3
(c) 7
(d) 6

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Q82. Which of the following sentences passed by a Sessions Judge requires mandatory confirmation by the High Court?

(a) Life imprisonment
(b) Imprisonment exceeding 5 yearss
(c) Imprisonment exceeding 10 years
(d) Capital punishment

Q83. If an angle of a parallelogram is 27° less than four-fifth of its adjacent angle, then find the smallest angle of the parallelogram.

(a) 50^0
(b) 45^0
(c) 65^0
(d) 70^0

Q84. The salaries of A, B, and C are in the ratio 3 : 10 : 8. If increments of 10%, 61%, and 20% are allowed respectively in their salaries, what will be the new ratio of their salaries?

(a) 35 : 163 : 102
(b) 30 : 165 : 98
(c) 34 : 167 : 103
(d) 33 : 161 : 96

Q85. A boat takes 27 minutes to go 40.6 km upstream. The ratio of the speed of the boat in still water to that of the stream is 8 : 7. How much total time (in hours) will the boat take to go 77.7 km upstream and 52.5 km downstream?

(a) 0.9
(b) 2.2
(c) 1.1
(d) 3.7

Q86. Who among the following was NOT a Mauryan ruler?

(a) Samprati
(b) Pushyamitra
(c) Devavarman
(d) Brihadratha

Q87. Find a single discount (rounded up to two decimal places) to equal three consecutive discounts of 6%, 28% and 15%

(a) 44.65%
(b) 42.63%
(c) 45.25%
(d) 42.47%

Q88. This question is based on the five, three-digit numbers given below.

(Left) 740 636 787 884 316 (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 second digit of the highest number is added to the third digit of the lowest number?

(a) 15
(b) 14
(c) 17
(d) 13

Q89. A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6. A lives on an odd numbered floor but not 3. The sum of floors on which C and A live is 4. Only 3 people live between E and F. B lives immediately above D. The sum of floors on which D and E live is 10. How many people live below F?

(a) 2
(b) 1

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(c) 3
(d) 4

Q90. In February 2025, an avalanche struck a Border Roads Organisation camp in which location, resulting in eight fatalities?
(a) Mana, Uttarakhand
(b) Tawang, Arunachal Pradesh
(c) Leh, Ladakh
(d) Kargil, Ladakh

Q91. A sphere with a radius of 53 cm is melted to form a cone with the same radius at its base. Find the height (in cm) of the cone.
(a) 212
(b) 215
(c) 219
(d) 205

Q92. Which among the following contains a collection of eight poetic anthologies from ancient Tamil literature?
(a) Tolkappiyam
(b) Pattuppattu
(c) Silappatikaram
(d) Ettuttokai

Q93. What should come in place of the question mark (?) in the given series?
892 890 886 880 872 ?
(a) 863
(b) 862
(c) 860
(d) 861

Q94. In this question, a group of letters is coded by using numbers and symbols as per the table given below and the conditions which follow.

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

Conditions:
1. If the 1^(st) letter is a vowel and the 3^(rd) letter is a consonant, both to be coded as the code of the consonant.
2. If the 1^(st) and last letters are vowels, both are to be coded as ‘N’.
3. If the 2^(nd) and last letters are vowels, their codes are to be interchanged. What is the correct combination of codes (by following only the applicable condition(s)) for the following letters?
SEMTU
(a) @ 7 4 * 2
(b) @ 2 4 * 2
(c) @ 2 4 * 7
(d) @ 7 4 * 7

Q95. Which of the following letter-number-clusters will replace the question mark (?) in the given series to make it logically complete?
GOQ 35, HPR 32, IQS 29, JRT 26, ?
(a) KPN 22
(b) KSU 23
(c) RQM 22
(d) RPM 23

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Q96. Vipul spends 55% of his income. If he saves Rs. 18,000, then his income (in Rs.) is:

(a) 40,000
(b) 39,000
(c) 41,000
(d) 9,900

Q97. What is the main advantage of saving an MS PowerPoint presentation as a .pdf file?

(a) It allows all MS PowerPoint animations to run.
(b) It reduces file size and prevents unwanted editing.
(c) It enables users to modify slides in any PDF viewer.
(d) It automatically translates text into different languages.

Q98. If 1 is added to each even digit and 1 is added to each odd digit in the number 7142568, what will be the sum of the first digit from the left and the first digit from the right in the new number thus formed?

(a) 14
(b) 15
(c) 17
(d) 10

Q99. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) LQ – SP
(b) EJ – LI
(c) UZ – BY
(d) JO – QM

Q100. With reference to the 40^(th) Amendment Act, 1976, which category of maritime zones came under the legislative jurisdiction of the Parliament?

(a) Inland rivers and lakes
(b) Inter-state river waters
(c) Groundwater reserves
(d) Territorial waters and EEZ

ANSWER KEY

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

SOLUTIONS

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Q1. Answer: (c) Wife's Father

A is				
Symbol	•	–	×	÷
Meaning	Sister	Brother	Wife	Father
of B				

Given Expression: M ÷ N – O + P × Q

M ÷ N: M is the father of N.

N – O: N is the brother of O.

O + P: O is the sister of P.

P × Q: P is the wife of Q.

According to the given information Family Tree Representation:

Therefore, M is the Wife's Father (Father-in-law) of Q.

Hence, the correct answer is "Option 3"

Q2. Answer: (b) Technological backwardness

The correct answer is Technological backwardness.

Key Points

• By the 1980s, India's Import Substitution Industrialisation (ISI) strategy faced significant limitations such as technological backwardness, which hindered productivity and competitiveness.

• The focus on domestic production led to limited access to advanced global technologies, impacting innovation and modernization.

• Many industries under ISI were protected by high tariffs, creating a lack of incentive to innovate or improve efficiency.

• Technological stagnation resulted in poor quality of goods and inability to meet international standards, further limiting exports.

• Countries relying on ISI strategies often struggled with low industrial diversification, exacerbating technological deficiencies.

Additional Information

• Import Substitution Industrialisation (ISI):

• ISI is an economic policy aimed at reducing dependency on imports by promoting domestic production of goods.

• It was widely adopted by developing countries post-World War II to foster industrial growth and economic independence.

• Protectionism in ISI:

• High import tariffs and quotas were imposed to protect domestic industries.

• While it encouraged initial industrial growth, it often led to inefficiency and lack of global competitiveness.

• Technological Stagnation:

• Limited investment in research and development under ISI policies contributed to technological backwardness.

• Dependence on outdated technologies restricted productivity and innovation.

• Shift to Liberalization:

• India began liberalizing its economy in 1991, moving away from ISI towards globalization and free-market policies.

• This shift aimed to integrate India into the global economy and encourage technological advancements through foreign investments.

Q3. Answer: (a) Shaka

The correct answer is Shaka.

Key Points

• Rudradaman I was a prominent ruler of the Western Kshatrapas, a branch of the Shaka dynasty, in the middle of the second century AD.

• He is known for his rule over regions that included Mathura, Gujarat, and parts of Malwa and Kathiawar.

• Rudradaman is celebrated for his administrative skills and military achievements, including his victory over the Satavahanas.

• He issued the Junagadh Rock Inscription, one of the earliest known inscriptions written in Sanskrit, which highlights his achievements and governance.

• The Shaka dynasty played a significant role in Indian history, introducing administrative reforms and patronizing art and culture in their territories.

Additional Information

• Shaka Dynasty:

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• The Shakas were a branch of the Scythians who migrated to India and established rule in northwestern and western regions.

• They are known as the Western Kshatrapas in Indian history.

• Junagadh Rock Inscription:

• This inscription was commissioned by Rudradaman I around 150 AD.

• It records the construction of the Sudarshana Lake and highlights the achievements of Rudradaman.

• Western Kshatrapas:

• The Western Kshatrapas were a line of Indo-Scythian rulers who controlled parts of modern-day Gujarat, Maharashtra, and Madhya Pradesh.

• They were contemporaries of the Satavahanas and Gupta Empires.

• Decline of the Shaka Dynasty:

• The Shaka rule came to an end with the rise of the Gupta Empire, particularly under Chandragupta II (Vikramaditya), who defeated the Shaka ruler Rudrasimha III.

Q4. Answer: (a) Rs. 1,11,384

Shortcut Trick

Quarterly Rate = 40% ÷ 4 = 10% | Time = 4 quarters.

Successive percentage for 10% for 4 periods = 46.41%.

Compound Interest = 2,40,000 × 46.41/100

CI = 2,400 × 46.41 = Rs. 1,11,384.

Therefore The correct answer is Rs. 1,11,384.

Alternate Method

Given: Principal (P) = Rs. 2,40,000, Rate (R) = 40% p.a., Time (T) = 1 year.

Formula: Amount (A) = $P(1 + r/100)^n$ | CI = A − P

=> Quarterly Rate (r) = 40% ÷ 4 = 10%

=> Number of quarters (n) = 1 × 4 = 4

=> Amount (A) = 2,40,000 × (1 + 10/100)^4

=> A = 2,40,000 × (1.1)^4

=> A = 2,40,000 × 1.4641 = 3,51,384

=> Compound Interest (CI) = A − P

=> CI = 3,51,384 − 2,40,000 = 1,11,384

Therefore The correct answer is Rs. 1,11,384.

Additional Information

Effective Rate of Interest

When interest is compounded quarterly, the effective annual rate is (1 + r/400)^4 − 1.

Compounding Frequency

As the frequency of compounding increases (daily > monthly > quarterly > yearly), the Compound Interest earned also increases for the same rate and principal.

Rule of 72

To find the approximate time needed to double your money, divide 72 by the annual interest rate (72 ÷ R).

Q5. Answer: (a) GST

The correct answer is GST.

Key Points

• Goods and Services Tax (GST) is a unified indirect tax system implemented in India to eliminate cascading effects of taxation.

• The concept of Input Tax Credit (ITC) under GST allows businesses to claim credit for the tax paid on purchases and use it to offset the tax liability on sales.

• GST ensures an uninterrupted and seamless chain of Input Tax Credit, reducing the tax burden at each stage of value addition.

• ITC under GST is applicable to both goods and services, aligning with the “One Nation, One Tax” principle.

• This mechanism improves compliance, ensures transparency, and helps in making products and services more competitive in the market.

Additional Information

• Cascading Tax Effect:

• Occurs when tax is levied on a product at every stage of production without credit for the taxes paid in the earlier stages.

• GST eliminates this issue by enabling ITC throughout the supply chain.
• Input Tax Credit (ITC):
• ITC allows taxpayers to deduct the tax paid on inputs from the tax payable on final output.
• Conditions for availing ITC include possession of tax invoice, receipt of goods/services, and payment of tax to the government.
• GST Structure:
• GST comprises Central GST (CGST), State GST (SGST), and Integrated GST (IGST).
• ITC is transferable between CGST and SGST/IGST under specific rules.
• Benefits of GST:
• Creates a unified tax structure across India, boosting ease of doing business.
• Reduces tax evasion by integrating tax systems digitally.
• Promotes transparency and reduces litigation in tax administration.

Q6. Answer: (a) 8

Given:

1 is added to each odd digit and 2 is subtracted from each even digit in the number 3762184.

Given	3	7	6	2	1	8	4
Operation	+1	+1	-2	-2	+1	-2	-2
New number	4	8	4	0	2	6	2

The new number formed is 4840262.

The digits in the new number are 0, 2, 2, 4, 4, 6, 8.

The highest digit in the new number is 8.

The lowest digit in the new number is 0.

Sum of the highest and lowest digits = 8 + 0 = 8.

Hence, the correct answer is "Option 1".

Q7. Answer: (d) Neither conclusion (I) nor (II) follows

The least possible venn diagram is:

Conclusions:

(I) All roads are bikes → False (As, All bikes are roads. so, All roads are bikes can be a possibility but not definte)

(II) All roads are TVs → False (As, Some roads are TVs. so, All roads are TVs can be a possibility but not definte)

Thus, Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 4".

Q8. Answer: (a) It is used in refrigeration and aerosol production.

The correct answer is It is used in refrigeration and aerosol production..

Key Points

• Freon is a trade name for a group of chlorofluorocarbons (CFCs) and related compounds primarily used as refrigerants.
• It is widely used in refrigeration systems such as air conditioners, refrigerators, and freezers.
• Freon is also used in the production of aerosol propellants due to its ability to maintain pressure and flow consistency.
• The use of Freon has been regulated under international agreements like the Montreal Protocol due to its contribution to ozone layer depletion.
• Modern refrigeration systems are transitioning to alternative, eco-friendly refrigerants to replace Freon.

Additional Information

• Chlorofluorocarbons (CFCs):
• CFCs are compounds made up of chlorine, fluorine, and carbon atoms.
• They were once widely used in refrigeration, air conditioning, and aerosol sprays.
• CFCs are known to cause ozone depletion in the stratosphere.
• Montreal Protocol:
• An international treaty signed in 1987 to phase out substances that deplete the ozone layer, including CFCs.
• The treaty has been highly successful in reducing the production and consumption of ozone-depleting substances.
• Environmental Impact of Freon:

• Freon contributes to global warming and ozone layer depletion.

• Hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) are transitional substitutes but are also being phased out due to environmental concerns.

• Alternative Refrigerants:

• Eco-friendly refrigerants like ammonia (NH3), carbon dioxide (CO2), and hydrocarbons (e.g., isobutane) are being adopted.

• These alternatives have a lower global warming potential (GWP) and no ozone depletion potential (ODP).

Q9. Answer: (a) 3 km to the west

Given:

Rituraj starts from Point A and drives 11 km towards South. He then takes a right turn, drives 9 km, turns right and drives 12 km.

He then takes a right turn and drives 12 km. He takes a final right turn, drives 1 km and stops at Point P.

Thus, Rituraj has to drive 3km west to reach point A.

Hence, the correct answer is "Option 1".

Q10. Answer: (d) -209

Shortcut Trick

If a common root is given for a quadratic equation, that value must satisfy the equation containing the unknown variable.

Directly substitute x = 11 into the equation 2x2 − 3x + c = 0.

2(11)2 − 3(11) + c = 0

242 − 33 + c = 0 => 209 + c = 0 => c = −209.

Therefore The correct answer is -209.

Alternate Method

Given:

Quadratic Equations: 2x2 − 3x + c = 0 and x2 − 9x − 22 = 0.

Common Root (α) = 11.

Method:

A root of an equation is the value of the variable that makes the equation equal to zero. Since 11 is a common root, it must satisfy both equations.

Calculations:

Step 1: Check the root in the second equation (optional but verifies the data).

=> (11)2 − 9(11) − 22 = 0

=> 121 − 99 − 22 = 121 − 121 = 0 (Verified).

Step 2: Substitute x = 11 in the first equation to find 'c'.

=> 2(11)2 − 3(11) + c = 0

=> 2 × 121 − 33 + c = 0

=> 242 − 33 + c = 0

=> 209 + c = 0

=> c = −209

Therefore The correct answer is -209.

Additional Information

Condition for Common Roots

If two quadratic equations have one common root, that root satisfies both equations. If they have both roots common, the coefficients are proportional: a1/a2 = b1/b2 = c1/c2.

Nature of Roots

For a quadratic equation ax2 + bx + c = 0, the Discriminant (D) = b2 − 4ac determines the nature: D > 0 (Real and Distinct), D = 0 (Real and Equal), D < 0 (Imaginary).

Vieta's Formulas

For the equation ax2 + bx + c = 0, the Sum of roots (α + β) = −b/a and the Product of roots (αβ) = c/a.

Q11. Answer: (b) Two

Given : G, H, I, J, K and X live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6.

1) No one lives above I.

Floor	Person
6 (Top)	I
5	
4	
3	
2	
1 (Bottom)	

2) K lives on an odd numbered floor but not on the lowermost floor.

3) X lives immediately below K.

Floor	Case 1: K on 5	Case 2: K on 3
6 (Top)	I	I
5	K	
4	X	
3		K
2		X
1 (Bottom)		

4) Only two people live between K and G.

Evaluation of Cases:

However, I already lives on Floor 6. Thus, Case 2 is Eliminated.

Floor	Person
6 (Top)	I
5	K
4	X
3	
2	G
1 (Bottom)	

5) Only two people live between I and H.

Floor	Person
6 (Top)	I
5	K
4	X
3	H
2	G
1 (Bottom)	J

There are 2 people (G and H) living between J and X.

Hence, the correct answer is "Option 2".

Q12. Answer: (c) Earth observation and climate monitoring

The correct answer is Earth observation and climate monitoring.

Key Points

• NISAR (NASA-ISRO Synthetic Aperture Radar) is a joint Earth observation satellite developed collaboratively by NASA and

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ISRO.

• The satellite is designed to monitor ecosystem disturbances, natural hazards, and global environmental changes such as ice sheet dynamics, forest biomass, and agricultural patterns.

• Equipped with dual-frequency radar systems (L-band by NASA and S-band by ISRO), NISAR ensures high-resolution imaging capabilities.

• The mission aims to deliver critical data for climate monitoring, disaster management, and resource mapping globally.

• It is set to launch in February 2025, marking a significant collaboration in Earth science between the two space agencies.

Additional Information

• Synthetic Aperture Radar (SAR):

• A radar technology that creates high-resolution images of the Earth's surface by emitting and receiving microwave signals.

• It is capable of penetrating clouds, vegetation, and even soil, making it useful for all-weather, day-night observations.

• L-band and S-band Radars:

• L-band radar (long wavelength) is ideal for monitoring vegetation and soil moisture, while S-band radar (shorter wavelength) is suited for detecting finer details like ice and infrastructure.

• Key Applications of NISAR:

• Tracking deforestation, agricultural patterns, and glacier movements.

• Monitoring natural disasters like earthquakes, tsunamis, and floods to aid in disaster response.

• Data Contribution:

• NISAR will provide up to 12 terabytes of imaging data daily, supporting global climate studies and environmental monitoring.

• ISRO-NASA Collaboration:

• This partnership strengthens international cooperation in space exploration and enhances the technological capabilities of both agencies.

Q13. Answer: (d) 23

Shortcut Trick

Net deviation from the average (40) must be zero.

Deviations: (40 − 40) = 0; (42 − 40) = +2; (55 − 40) = +15.

Total deviation = 0 + 2 + 15 = +17.

To balance, fourth number deviation must be −17.

Fourth number = 40 − 17 = 23.

Therefore The correct answer is 23.

Alternate Method

Given: Average of 4 numbers = 40; Three numbers are 40, 42, and 55.

Formula Used: Sum of observations = Average × Number of observations

=> Total sum = 40 × 4 = 160

=> Sum of the three known numbers = 40 + 42 + 55 = 137

=> Fourth number = Total sum − Sum of three numbers

=> Fourth number = 160 − 137

=> Fourth number = 23

Therefore The correct answer is 23.

Additional Information

Sum of Deviations

The sum of the deviations of all observations from their arithmetic mean is always zero. This property is used in the deviation method shortcut.

Average of Consecutive Numbers

For an arithmetic progression (AP), Average = (First Term + Last Term) ÷ 2. This applies to consecutive integers, even numbers, or odd numbers.

Combined Average

If two groups have sizes n1, n2 and averages A1, A2, then the combined average = (n1A1 + n2A2) ÷ (n1 + n2).

Q14. Answer: (b) zi

The given code language is:

Thus, 'drive' is coded as 'zi'.

Hence, the correct answer is "Option 2".

Q15. Answer: (c) 3

Given:

Expression: √(0.012321) / √(0.001369)

Formula used:

√(a) / √(b) = √(a / b)

Calculation:

√(0.012321) / √(0.001369)

=> √(0.012321 / 0.001369)

=> √(9)

=> 3

Therefore The correct answer is option (3).

Q16. Answer: (b) 801

Given interchange rules:

• '+' and '−' are interchanged.

• '×' and '÷' are interchanged.

The given equation is:

405 ÷ 2 + 369 × 9 − 32 = ?

Replace the operators with their corresponding new meanings:

405 × 2 − 369 ÷ 9 + 32 = ?

Now, we solve the equation following the BODMAS rule:

= 405 × 2 − 369 ÷ 9 + 32

= 810 − 41 + 32

= 769 + 32

= 801

Hence, the correct answer is "Option 2".

Q17. Answer: (c) 33 km/hr

Shortcut Trick

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

Speed = (40 + 26) ÷ 2

Speed = 66 ÷ 2 = 33 km/hr

Therefore The correct answer is 33 km/hr.

Alternate Method

Given:

Downstream speed (v) = 40 km/hr

Upstream speed (u) = 26 km/hr

Formula Used:

Speed of swimmer in still water (x) = (v + u) ÷ 2

Calculations:

=> Speed in still water = (40 + 26) ÷ 2

=> Speed in still water = 66 ÷ 2

=> Speed in still water = 33 km/hr

Therefore The correct answer is 33 km/hr.

Additional Information

Speed of Stream

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

Downstream Speed

It is the sum of the speed of the boat in still water and the speed of the stream (u + v).

Upstream Speed

It is the difference between the speed of the boat in still water and the speed of the stream (u − v).

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Q18. Answer: (d) 142

The logic followed here is:

Thus, the missing term in the series is 142.

Hence, the correct answer is "Option 4";

Q19. Answer: (c) 180π

Shortcut Trick

Volume of full conical vessel = (1/3) × π × r^2 × h

Volume = (1/3) × π × 6^2 × 20 = (1/3) × π × 36 × 20 = 12 × 20 × π = 240π cm^3

Volume of water = (3/4) × Total Volume = (3/4) × 240π

Volume of water = 3 × 60π = 180π cm^3

Therefore The correct answer is 180π cm^3.

Alternate Method

Given:

Base radius (r) = 6 cm

Height (h) = 20 cm

Water level = 3/4 full

Formula Used:

Volume of Cone (V) = (1/3)πr^2h

Calculations:

=> Total capacity of vessel = (1/3) × π × $(6)^2$ × 20

=> Total capacity = (1/3) × π × 36 × 20

=> Total capacity = 12 × 20 × π = 240π cm^3

=> Volume of water poured = 3/4 × Total capacity

=> Volume of water = (3/4) × 240π

=> Volume of water = 3 × 60π = 180π cm^3

Therefore The correct answer is 180π cm^3.

Additional Information

Slant Height of Cone

The slant height (l) is given by l = √(r^2 + h^2), representing the distance from the apex to the edge of the base.

Surface Area of Cone

Curved Surface Area (CSA) = πrl and Total Surface Area (TSA) = πr(l + r).

Relationship with Cylinder

The volume of a cone is exactly 1/3 the volume of a cylinder with the same base radius and height.

Q20. Answer: (d) 9

Shortcut Trick

Mode is the value that appears most frequently in a data set.

Count the occurrences of each number in the given observations.

Frequency of 9 = 4 times.

Frequency of 2, 4, and 5 = 3 times each.

Since 9 has the maximum frequency, it is the mode.

Therefore The correct answer is 9.

Alternate Method

Given: Observations = 9, 6, 4, 2, 5, 2, 9, 2, 1, 9, 4, 5, 9, 5, 4, 8.

Formula: Mode = Value with the highest frequency.

=> Arrange the observations in ascending order: 1, 2, 2, 2, 4, 4, 4, 5, 5, 5, 6, 8, 9, 9, 9, 9.

Q21. Answer: (a) 1687

The correct answer is 1687.

Key Points

• Municipal governance was first introduced in British India in 1687, with the establishment of the municipal corporation in Madras (now Chennai).

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• The Madras Municipal Corporation was the first attempt by the British to introduce local self-governance in India.

• Following Madras, municipal governance was later extended to Bombay and Calcutta in the early 18th century.

• The introduction of municipal governance aimed to ensure better administration, sanitation, and infrastructure development in urban centers.

• It laid the foundation for modern urban governance in India, which later evolved through subsequent legislative reforms.

Additional Information

• Terminology:

• Municipal Corporation: It is a form of urban local governance responsible for the administration of cities with large populations.

• Local Self-Governance: A system of governance where local authorities manage their own affairs independently within the framework of a larger governing system.

• Evolution of Municipal Governance:

• In 1882, Lord Ripon introduced reforms to strengthen local self-governance, often referred to as the "Father of Local Self-Government in India."

• The Montague-Chelmsford Reforms (1919) further emphasized the importance of local governance under the provincial governments.

• Modern Municipal Governance:

• The 74th Constitutional Amendment Act of 1992 provided a constitutional status to municipalities and introduced the concept of urban local bodies.

• It mandated the establishment of municipal corporations, municipal councils, and Nagar Panchayats based on population size.

• Impact:

• Municipal governance in India plays a key role in urban planning, infrastructure development, and the delivery of essential services.

• It ensures civic amenities such as water supply, waste management, street lighting, and public health services.

Q22. Answer: (a) Drone Surveying

The correct answer is Drone Surveying.

Key Points

• The SVAMITVA scheme was launched by the Government of India on April 24, 2020, to provide rural landowners with property ownership rights.

• Under the scheme, drone technology is used for mapping land parcels in rural areas to create accurate land records.

• Drone surveying ensures high-resolution aerial imagery that facilitates precision mapping and minimizes disputes related to land ownership.

• The maps generated via drones are integrated with Geographical Information Systems (GIS) for ease of access and management.

• This initiative aims to promote financial stability in rural areas by enabling landowners to use their property as collateral for loans and other financial activities.

Additional Information

• Drone Technology:

• Drones, also known as unmanned aerial vehicles (UAVs), are equipped with cameras, sensors, and GPS systems for high-precision surveying and mapping.

• They are widely used in agriculture, disaster management, urban planning, and land surveys due to their efficiency and accuracy.

• Geographical Information System (GIS):

• GIS is a computer-based tool that analyzes and visualizes spatial data. It integrates maps and data layers for better decision-making.

• It plays a critical role in land management, urban planning, and environmental monitoring.

• Objectives of SVAMITVA Scheme:

• To create a comprehensive digital record of land ownership in rural India.

• To reduce disputes related to land ownership and promote transparency.

• To empower rural property owners by enabling them to monetize their assets.

• Implementation:

• The scheme is implemented by the Ministry of Panchayati Raj in collaboration with the Survey of India.

• States and Union Territories actively participate in the process of land survey and mapping.

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Q23. Answer: (d) 252

Shortcut Trick

The Marked Price (MP) is Rs. 640.

Successive discounts are 30%, 25%, and an additional 25% for cash.

Selling Price (SP) = 640 × (70 ÷ 100) × (75 ÷ 100) × (75 ÷ 100).

SP = 640 × (7 ÷ 10) × (3 ÷ 4) × (3 ÷ 4).

SP = 640 × (63 ÷ 160) = 4 × 63 = 252.

Therefore The correct answer is Rs. 252.

Alternate Method

Given: MP = Rs. 640, D1 = 30%, D2 = 25%, D3 (cash) = 25%.

Formula: SP = MP × (100 − D1)% × (100 − D2)% × (100 − D3)%

=> Price after 1st discount = 640 − (30% of 640) = 640 − 192 = 448.

=> Price after 2nd discount = 448 − (25% of 448) = 448 − 112 = 336.

=> Price after 3rd (cash) discount = 336 − (25% of 336) = 336 − 84 = 252.

Therefore The correct answer is Rs. 252.

Additional Information

Successive Discounts

When multiple discounts are applied one after another, the single equivalent discount for two discounts a% and b% is given by (a + b − ab ÷ 100)%.

Marked Price & Selling Price

Marked Price is the listed price on the tag. Selling Price is the final amount paid after deducting all applicable discounts from the MP.

Q24. Answer: (b) Clock speed

The correct answer is Clock speed.

Key Points

• Clock speed refers to the number of cycles a CPU can execute per second, usually measured in Hertz (Hz). A higher clock speed indicates a faster CPU.

• It directly affects how quickly a processor can process instructions and execute tasks.

• Modern CPUs have clock speeds typically measured in gigahertz (GHz), representing billions of cycles per second.

• Clock speed is a critical factor for performance, but it must be paired with other components like memory and storage for optimal efficiency.

• Overclocking can increase clock speed beyond the manufacturer's specifications, potentially enhancing performance but at the risk of increased heat and reduced stability.

Additional Information

• Cache size: Refers to the small-sized, high-speed memory located inside the CPU to store frequently accessed data. While it affects performance, it does not determine the number of instructions processed per second.

• Number of registers: Registers are small storage locations within the CPU used to store data temporarily during execution. While essential for operations, they do not directly dictate processing speed.

• Power consumption: Indicates the energy required by the CPU during operation. While it impacts efficiency and heat generation, it does not determine instruction execution.

• Pipelining: A technique used by modern CPUs to execute multiple instructions simultaneously by dividing the execution process into stages, improving overall performance.

• Multi-core processors: CPUs with multiple cores can process multiple instructions simultaneously, enhancing processing capability, especially for multitasking and parallel processing workloads.

Q25. Answer: (a) -504

Shortcut Trick

Use the direct combined algebraic identity:

Value = $(x + y + z) \times [3(x^2 + y^2 + z^2) - (x + y + z)^2] \div 2$

Value = $12 \times [3(20) - (12)^2] \div 2$

Value = $12 \times [60 - 144] \div 2 = 12 \times (-84) \div 2$

Value = $12 \times (-42) = -504$

Therefore The correct answer is −504.

Alternate Method

Given: Sum of numbers $(x + y + z) = 12$ and sum of their squares $(x^2 + y^2 + z^2) = 20$.

We know the expansion formula:

$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$\Rightarrow (12)^2 = 20 + 2(xy + yz + zx)$

$\Rightarrow 144 - 20 = 2(xy + yz + zx)$

$\Rightarrow 124 = 2(xy + yz + zx)$

$\Rightarrow xy + yz + zx = 62$

Now, to find the value of $x^3 + y^3 + z^3 - 3xyz$, use the standard algebraic identity:

$x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - (xy + yz + zx))$

$\Rightarrow$ Value $= 12 \times (20 - 62)$

$\Rightarrow$ Value $= 12 \times (-42)$

$\Rightarrow$ Value $= -504$

Therefore The correct answer is -504.

Additional Information

Special Case: $x + y + z = 0$

If the sum of three numbers is zero, then $x^3 + y^3 + z^3 = 3xyz$.

Alternative form of the identity

$x^3 + y^3 + z^3 - 3xyz = (1/2)(x + y + z)[(x - y)^2 + (y - z)^2 + (z - x)^2]$, which is useful when differences between numbers are given.

Identity for squares

$x^2 + y^2 + z^2 - xy - yz - zx = (1/2)[(x - y)^2 + (y - z)^2 + (z - x)^2]$.

Q26. Answer: (d) 5

Given : Seven boxes, A, B, C, D, E, F and G, are kept one above the other but not necessarily in the same order. The positions are counted from top to bottom.

1) Only two boxes are kept below C.

2) Only one box is kept above A.

3) Only one box is kept between A and E.

Position	Box
1 (Top)	
2	A
3	
4	E
5	C
6	
7 (Bottom)	

4) B is kept immediately above F (BF block).

Position	Box
1 (Top)	
2	A
3	
4	E
5	C
6	B
7 (Bottom)	F

5) D is kept at some place below G (G ... D).

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

There are 5 boxes kept above B.

Hence, the correct answer is "Option 4".

Q27. Answer: (d) 17,600

Shortcut Trick

Net interest percentage for 2 years = Rate × Time = 4% × 2 = 8%

Simple Interest = 8% of Rs. 2,20,000

Simple Interest = 0.08 × 2,20,000 = Rs. 17,600

Therefore The correct answer is Rs. 17,600.

Alternate Method

Given:

Principal (P) = Rs. 2,20,000

Rate (R) = 4% per annum

Time (T) = 2 years

Formula Used:

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

Calculations:

=> SI = (2,20,000 × 4 × 2) ÷ 100

=> SI = 2,200 × 8

=> SI = Rs. 17,600

Therefore The correct answer is Rs. 17,600.

Additional Information

Total Amount Formula

The total amount (A) to be paid back is the sum of Principal and Simple Interest: A = P + SI.

Rate of Interest Calculation

To find the rate when SI, P, and T are known: R = (SI × 100) ÷ (P × T).

SI vs CI for 2 Years

The difference between Compound Interest and Simple Interest for 2 years is: CI − SI = $P(R/100)^2$.

Q28. Answer: (b) Pensions paid to the princes after integration

The correct answer is Pensions paid to the princes after integration.

Key Points

• The privy purses were annual payments made by the Government of India to former princely rulers after the integration of princely states into independent India.

• The payments were part of an agreement during the integration process, ensuring economic security to the princes who surrendered their sovereignty.

• The privy purses were paid as compensation for merging their states into the Indian Union after independence in 1947.

• In 1971, the privy purses were abolished by the then Prime Minister Indira Gandhi through a constitutional amendment, citing reasons of equality and the need to end privileges.

• The abolition of privy purses marked a significant step in eliminating feudal privileges and ensuring a more egalitarian society.

Additional Information

• Integration of Princely States:

• India had over 500 princely states at the time of independence in 1947.
• Sardar Vallabhbhai Patel and V.P. Menon played a key role in integrating these states into the Indian Union.
• The princely rulers agreed to the merger in exchange for privileges, including privy purses.
• Constitutional Basis:
• The privy purses were guaranteed under Article 291 of the Indian Constitution.
• They were later abolished through the 26th Constitutional Amendment Act, 1971.
• Reasons for Abolition:
• The Indian government argued that privy purses were inconsistent with the socialist and democratic ideals of the Constitution.
• The move was seen as a step towards ending hereditary privileges and promoting equality.
• Impact of Abolition:
• The abolition of privy purses led to financial difficulties for some former rulers but was widely hailed as a progressive measure.
• It reinforced India's commitment to egalitarianism and democratic values.

Q29. Answer: (a) 66

Given:

49 + [7 + {63 − (27 ÷ 9)} ÷ 6]

Calculation:

=> 49 + [7 + {63 − 3} ÷ 6]

=> 49 + [7 + 60 ÷ 6]

=> 49 + [7 + 10]

=> 49 + 17

Therefore Final Answer = 66

Q30. Answer: (b) 2

Given series:

(Left) 3 € & £ @ * # 1 $ € @ © € © & 1 € 4 1 2 4 © (Right)

Condition to be checked:

Number → Symbol → Symbol

3 € & £ @ * # 1 $ € @ © € © & 1 € 4 1 2 4 ©

There are two such symbols in the above arrangement (3 € &, 1 $ €).

Hence, the correct answer is "Option 2".

Q31. Answer: (c) International Day of Education

The correct answer is International Day of Education.

Key Points

• The International Day of Education is observed globally on 24 January every year.
• It was proclaimed by the United Nations General Assembly in December 2018 to emphasize the role of education in peace and development.
• UNESCO leads the global observance of this day, focusing on ensuring inclusive and equitable quality education for all as part of the Sustainable Development Goal 4 (SDG 4).
• The theme for 2025 will highlight the importance of transformative education in addressing global challenges such as climate change, inequality, and poverty.
• The day serves as a call to action to prioritize education in policy-making and funding globally, aiming to build resilient and sustainable societies.

Additional Information

• Education as a Human Right:
• The Universal Declaration of Human Rights (1948) recognizes education as a fundamental human right under Article 26.
• It emphasizes that primary education should be free and compulsory for all children.
• Sustainable Development Goal 4:
• SDG 4 aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030.
• Key targets include universal primary and secondary education, vocational training, and eliminating gender disparities in access to education.
• UNESCO's Role:
• UNESCO leads global efforts to advance education as a tool for peace, sustainable development, and social equity.

• It supports member states in implementing educational policies and frameworks aligned with global goals.
• Challenges in Global Education:
• An estimated 244 million children and youth were out of school globally as of 2023.
• Barriers include poverty, gender inequality, conflict, and lack of infrastructure.
• Transformative Education:
• Transformative education focuses on empowering learners to become active participants in addressing global challenges.
• It integrates critical thinking, digital literacy, and environmental awareness into curricula.

Q32. Answer: (a) PW54

The pattern followed here is.

Thus, the missing term in the series is PW54.

Hence, the correct answer is Option 1.

Q33. Answer: (b) Rajasthan, Gujarat, Punjab, and Haryana

The correct answer is Option 2: Rajasthan, Gujarat, Punjab, and Haryana.

Key Points

• The Thar Desert, also known as the Great Indian Desert, is predominantly located in the northwestern region of India.
• It spans across the Indian states of Rajasthan, Gujarat, Punjab, and Haryana, making it a significant geographical feature in these areas.
• The desert covers approximately 77,000 square miles (200,000 square kilometers), with Rajasthan accounting for the majority of its land area.
• It is characterized by arid conditions, sand dunes, sparse vegetation, and extreme temperatures, making it one of the most inhospitable regions in India.
• The Thar Desert also extends into Pakistan, but the majority of its area lies within Indian territory.

Additional Information

• Climate of the Thar Desert:
• The Thar Desert experiences an arid climate with very low rainfall, typically less than 200mm annually.
• Temperatures can soar above 50°C in the summer and drop below freezing in the winter.
• Ecological Significance:
• The desert hosts unique flora and fauna adapted to its harsh conditions, including desert foxes, camels, and khejri trees.
• The Desert National Park located in Rajasthan is a protected area that showcases the biodiversity of the region.
• Human Settlement:
• The Thar Desert is one of the world's most densely populated deserts, with villages scattered across its landscape.
• Traditional occupations in the region include camel breeding, agriculture (using irrigation), and handicrafts.
• Geographical Features:
• Sand dunes, salt pans, and rocky outcrops are prominent features of the Thar Desert's terrain.
• The Luni River is the only major river flowing through the desert region.

Q34. Answer: (d) Indira Gandhi Canal

The correct answer is Indira Gandhi Canal.

Key Points

• The Indira Gandhi Canal is one of the largest canal systems in India, and it plays a vital role in providing water for irrigation in the Thar Desert region.
• The canal originates at the Harike Barrage, located at the confluence of the Sutlej and Beas rivers in Punjab, and flows through Rajasthan.
• It was commissioned in 1984 and provides water to the arid regions of western Rajasthan, including Jodhpur, Bikaner, and surrounding areas.
• The canal irrigates around 19 lakh hectares of land, transforming barren areas into fertile agricultural lands in the desert.
• The project has significantly contributed to the socio-economic development of the region, ensuring food security and better livelihoods for farmers.

Additional Information

• Thar Desert:
• The Thar Desert, also known as the Great Indian Desert, is the 17th largest desert in the world and covers approximately 200,000 square kilometers.

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• It spans the states of Rajasthan, Gujarat, Punjab, and Haryana, with Rajasthan having the largest share.

• It is characterized by extreme arid conditions, high temperatures, and low rainfall (100-200 mm annually).

• Harike Barrage:

• The Harike Barrage is located in Punjab and serves as the source of the Indira Gandhi Canal.

• The barrage helps regulate the water flow from the Sutlej and Beas rivers into the canal system.

• Water Management in Arid Regions:

• The Indira Gandhi Canal project demonstrates how large-scale irrigation systems can combat desertification and promote agricultural activities in arid regions.

• It is an example of utilizing inter-basin water transfer to address water scarcity.

• Economic Impact:

• The Indira Gandhi Canal has boosted agriculture, created employment opportunities, and improved the quality of life for people in western Rajasthan.

• It has facilitated the cultivation of crops such as wheat, mustard, and cotton, which were previously impossible in the desert environment.

Q35. Answer: (b) 114

Shortcut Trick

Net efficiency for filling the tank = 1/18 − 1/19 = 1/342 part per hour.

Time to fill the full tank = 342 hours.

Time to fill one-third of the tank = 342 ÷ 3 = 114 hours.

Therefore The correct answer is 114 hours.

Alternate Method

Given:

Filling Tap time = 18 hours

Emptying Tap time = 19 hours

Target: Fill 1/3 of the tank capacity.

Tap Type Time (hr) Total Work (LCM) Efficiency Inlet (+) 18 342 units +19 Outlet (−) 19 −18

Calculations:

=> Total capacity of the cistern = LCM(18, 19) = 342 units.

=> Net efficiency of both taps = 19 − 18 = 1 unit/hour.

=> Target volume to be filled = 1/3 × 342 = 114 units.

=> Time required = Target Volume ÷ Net Efficiency

=> Time required = 114 ÷ 1 = 114 hours.

Therefore The correct answer is 114 hours.

Additional Information

Pipes and Cisterns Basics

Efficiency of an Inlet pipe is always positive, while the efficiency of an Outlet (leakage) pipe is taken as negative.

Total Work Concept

Total capacity or work is usually the Least Common Multiple (LCM) of the individual times taken by each pipe.

Combined Rate Formula

If pipe A fills in 'x' hours and pipe B empties in 'y' hours, net rate per hour is (1/x − 1/y). Tank fills only if x < y.

Q36. Answer: (c) Curvilinear shikharas

The correct answer is Curvilinear shikharas.

Key Points

• The Jageshwar temple complexes in Uttarakhand are renowned for their Nagara-style architecture, which is characterized by curvilinear shikharas (spires).

• Curvilinear shikharas are distinctively tall and tapering structures that rise upwards in a convex curve and are a hallmark of North Indian temple architecture.

• Jageshwar temples primarily date back to the 7th to 12th centuries CE, showcasing intricate stone carvings and traditional designs.

• The shikharas of these temples often have an amalaka (circular disc-like structure) at the top, symbolizing divine energy and protection.

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• The temple complex consists of over 100 small and large shrines dedicated to Lord Shiva, reflecting the religious significance of the region.

Additional Information

• Nagara Style Architecture:

• This style is predominant in northern India and is characterized by curvilinear shikharas and multiple smaller towers surrounding the main temple.

• Unlike Dravidian architecture, Nagara temples do not have elaborate gateways (gopurams) and often feature intricate carvings on stone.

• Amalaka:

• The amalaka is a distinctive circular stone disc found atop the shikhara, symbolizing purity and spiritual protection.

• It is often surmounted by a kalasha (pot-like structure), adding to the aesthetic and symbolic significance of the temple.

• Jageshwar Temple Complex:

• Located in the Almora district of Uttarakhand, this complex is considered one of the oldest centers of Shaivism in India.

• The temples are surrounded by dense deodar forests, contributing to their serene and spiritual ambiance.

• Historical Importance:

• The Jageshwar temples are believed to have been built during the Katyuri and Chand dynasties, showcasing the evolution of temple architecture.

• The complex has inscriptions and sculptures that provide insights into religious practices and artistic styles of ancient India.

Q37. Answer: (a) North East Delhi

The correct answer is North East Delhi.

Key Points

• As per the 2011 Census of India, North East Delhi recorded the highest population density in the country.

• North East Delhi had a population density of 37,346 persons per square kilometer, making it the most densely populated district in India.

• Population density is calculated as the number of persons per square kilometer of land area.

• North East Delhi is part of the National Capital Territory (NCT) of Delhi, which is itself one of the most urbanized and densely populated regions in India.

• The high population density in this region is attributed to urbanization, migration, and the concentration of residential settlements in limited geographic space.

Additional Information

• Population Density:

• Population density is a key demographic indicator that reflects the number of people living in a unit area of land.

• It is calculated using the formula: Population Density = Total Population / Land Area.

• 2011 Census of India:

• The 2011 Census was the 15th National Census of India and provided comprehensive data on population demographics, density, literacy, and other parameters.

• It recorded India's population at 1.21 billion, with a growth rate of 17.7% compared to 2001.

• Urbanization in Delhi:

• Delhi’s rapid urbanization has resulted in high population density, particularly in areas like North East Delhi.

• Migrants from different states move to Delhi for job opportunities, education, and improved living standards, contributing to its dense population.

• Other High-Density Districts:

• After North East Delhi, other districts with high population densities include Central Delhi and East Delhi.

• These regions also face challenges such as overcrowding, pressure on infrastructure, and environmental concerns.

Q38. Answer: (c) YC-TX-OS

The logic followed here is:

SW : NR : IM

IM : DH : YC

Option 1: UY-PT-LO

This option does NOT follow the pattern.

Option 2: FJ-AE-WZ

This option does NOT follow the pattern.

Option 3: YC-TX-OS

This option follows the pattern.

Option 4: HL-DG-XB

This option does NOT follow the pattern.

Hence, the correct answer is "Option 3".

Q39. Answer: (b) The system menu for the current window (containing options like Move, Size, Minimize, Maximize, Close)

The correct answer is The system menu for the current window (containing options like Move, Size, Minimize, Maximize, Close).

Key Points

• Pressing Alt + Spacebar in Windows applications typically opens the system menu for the current window.

• The system menu contains options such as Move, Size, Minimize, Maximize, and Close, allowing users to control the window's behavior.

• This shortcut provides users with quick access to window management functionalities without using the mouse.

• The system menu is an integral feature of the Windows graphical user interface (GUI), present since early versions of Windows.

• It works universally across most Windows applications, unless overridden by the application itself.

Additional Information

• System Menu:

• The system menu is a feature of Windows' GUI that allows users to manage the state and position of application windows.

• It can also be accessed by right-clicking the window's title bar or clicking the icon on the top-left corner of the window.

• Window Management Shortcuts:

• Other common shortcuts include Alt + Tab (switch between open applications) and Windows Key + D (show desktop).

• These shortcuts improve productivity by enabling faster navigation within the Windows environment.

• Customization:

• Applications can override the default behavior of Alt + Spacebar, replacing the system menu with custom menus or actions.

• This is common in some modern software where the developer opts for a streamlined user interface.

• Legacy Feature:

• The system menu has been present since early versions of Windows, including Windows 3.1.

• Despite modern UI advancements, this feature remains relevant for window management in current Windows versions.

Q40. Answer: (d) RO-TQ-VX

The logic followed here is:

LI : NK : PR

Option 1: RO-TQ-VY

This option does NOT follow the pattern.

Option 2: SO-TR-VY

This option does NOT follow the pattern.

Option 3: SO-TQ-VY

This option does NOT follow the pattern.

Option 4: RO-TQ-VX

This option follows the pattern.

Hence, the correct answer is "Option 4".

Q41. Answer: (a) 2 km to the west

Given:

Rohan starts from point A and drives 8 km towards the north.

He then takes a left turn, drives 12 km, turns left and drives 11 km. He then takes a left turn and drives 14 km. He takes a final left turn, drives 3 km and stops at point P.

Thus, Rohan has to drive 2km west to reach point A.

Hence, the correct answer is "Option 1".

Q42. Answer: (a) 5^(th)

The correct answer is 5th.

Key Points

• Deepti Sharma achieved the 5th rank in the ICC Women's All-rounders Rankings in March 2025.
• Deepti Sharma is one of India's most prominent all-rounders, excelling in both batting and bowling in international cricket.
• The ICC Rankings consider a player's performance across all formats (ODIs, T20Is, and Tests) to determine their ranking.
• Deepti's consistent performances in international tournaments contributed significantly to her rise in the rankings.
• The ICC updates its rankings regularly based on players' performances in recent matches.

Additional Information

• ICC Women’s Rankings:
• These rankings evaluate players’ performances in batting, bowling, and all-rounder categories across all formats of cricket.
• Points are calculated using a sophisticated algorithm that takes into account match context, opponent strength, and individual contributions.
• Deepti Sharma’s Cricketing Achievements:
• She has been a key player for the Indian Women’s Cricket Team, known for her dependable off-spin and strong batting performances.
• She holds the record for the highest individual score in Women's ODIs for India (188* against Ireland in 2017).
• All-rounder Role in Cricket:
• An all-rounder contributes significantly to both batting and bowling, making them a valuable asset to any team.
• Notable women’s cricket all-rounders include Ellyse Perry (Australia), Sophie Devine (New Zealand), and Stafanie Taylor (West Indies).
• ICC's Role in Cricket:
• The International Cricket Council (ICC) is the global governing body for cricket.
• It oversees international competitions, rankings, and the development of the sport worldwide.

Q43. Answer: (a) 186

Shortcut Trick

Sum of first 2 numbers = 77 × 2 = 154

Sum of first 3 numbers = 154 + 129 = 283

Sum of remaining 2 numbers = 655 − 283 = 372

Average of remaining 2 numbers = 372 ÷ 2 = 186

Therefore The correct answer is 186.

Alternate Method

Given:

Total sum of 5 numbers = 655

Average of first 2 numbers = 77

Third number = 129

Sum: 154

129

Remaining Sum

Total Sum = 655

First 2 Nos.

3rd No.

Last 2 Nos.

Formula used:

Sum = Average × Number of items

Average = Sum ÷ Number of items

Calculations:

=> Sum of first 2 numbers = 77 × 2 = 154

=> Sum of first 3 numbers = 154 + 129 = 283

=> Sum of remaining 2 numbers = Total sum − Sum of first 3 numbers

=> Sum of remaining 2 numbers = 655 − 283 = 372

=> Average of remaining 2 numbers = 372 ÷ 2

=> Average = 186

Therefore The correct answer is 186.

Additional Information

Basic Average Formula

The average of n numbers is calculated as the sum of all numbers divided by n (Average = Σx ÷ n).

Sum of Numbers

To find the total sum when the average is known, multiply the average by the count of numbers (Sum = Average × n).

Net Deviation Method

The sum of deviations of all observations from their mean is always zero, which can be used to find missing values in a series.

Q44. Answer: (b) Rs. 199

Shortcut Trick

Let original cost of pen be x and pencil be y.

Equation 1: 6x + 5y = 259

Equation 2: 19(x − 9) + 2(y + 4) = 90 => 19x + 2y = 90 + 171 − 8 = 253

Solving these: x = 9, y = 41 (Invalid, x must be pen cost). Re-check: 19x + 2y = 90 + 163 = 253. Multiply eq1 by 2 and eq2 by 5: 12x + 10y = 518 and 95x + 10y = 1265. Difference: 83x = 747 => x = 9. Then y = 41.

Original cost of 13 pens and 2 pencils = 13(9) + 2(41) = 117 + 82 = 199.

Therefore The correct answer is Rs. 199.

Alternate Method

Let the original cost of one pen be x and one pencil be y.

According to the first condition:

=> 6x + 5y = 259 --- (i)

According to the second condition (New costs: Pen = x − 9, Pencil = y + 4):

=> 19(x − 9) + 2(y + 4) = 90

=> 19x − 171 + 2y + 8 = 90

=> 19x + 2y − 163 = 90

=> 19x + 2y = 253 --- (ii)

To eliminate y, multiply (i) by 2 and (ii) by 5:

=> 12x + 10y = 518 --- (iii)

=> 95x + 10y = 1265 --- (iv)

Subtracting (iii) from (iv):

=> 83x = 747

=> x = 747 ÷ 83 = 9

Substitute x = 9 in (i):

=> 6(9) + 5y = 259

=> 54 + 5y = 259

=> 5y = 205 => y = 41

Required cost of 13 pens and 2 pencils:

=> 13x + 2y = 13(9) + 2(41)

=> 117 + 82 = 199

Therefore The correct answer is Rs. 199.

Additional Information

Linear Equations in Two Variables

Equations of the form ax + by = c represent straight lines. They can be solved using substitution, elimination, or cross-multiplication methods.

Elimination Method

Multiply equations by suitable constants to make the coefficients of one variable equal, then add or subtract to eliminate that variable.

Cost-Price Relationship

Total Cost = (Quantity1 × Price1) + (Quantity2 × Price2). Any change in individual price affects the total bill linearly.

Q45. Answer: (b) Village head

The correct answer is Village head.

Key Points

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• The Mahalwari system was introduced in 1833 by the British East India Company during the administration of Lord William Bentinck.

• Under this system, the village headman (or Pradhan) was made responsible for collecting land revenue from the farmers on behalf of the British government.

• The revenue settlement was made collectively for the village or estate, which was referred to as the "Mahal."

• This system was primarily implemented in parts of North-Western Provinces, Central Provinces, Punjab, and Uttar Pradesh.

• The goal was to create a direct link between the colonial administration and the village community, while also ensuring the efficient collection of revenue.

Additional Information

• Key Features of Mahalwari System:

• The system combined elements of both the Zamindari and Ryotwari systems.

• Revenue rates were periodically revised, and the village collectively bore the responsibility of payment.

• Zamindari System:

• In this system, land revenue was collected by landlords (Zamindars) from the peasants and paid to the British government.

• It was introduced in Bengal, Bihar, and Odisha under the Permanent Settlement Act of 1793.

• Ryotwari System:

• Here, the settlement was directly made with the cultivators (Ryots), who were recognized as the owners of the land.

• It was primarily implemented in Madras, Bombay, and parts of Assam.

• Purpose of Revenue Systems:

• The primary objective of these systems was to extract maximum revenue for the British administration.

• However, these policies often led to exploitation and economic distress among Indian farmers.

Q46. Answer: (b) Delhi

The correct answer is Delhi.

Key Points

• Delhi, a major center of the 1857 Revolt, was recaptured by British forces in September 1857.

• The siege of Delhi lasted from June 8 to September 20, 1857, and marked a critical turning point in the rebellion.

• The British forces, led by General John Nicholson, launched a decisive assault on the city, overcoming fierce resistance from the rebels.

• Delhi was significant as the symbolic seat of the Mughal Emperor, Bahadur Shah II, who was declared the nominal leader of the rebellion.

• The recapture of Delhi dealt a severe blow to the morale and coordination of the rebel forces during the uprising.

Additional Information

• 1857 Revolt: Also known as the First War of Indian Independence, it was a widespread rebellion against British rule.

• Bahadur Shah II: The last Mughal Emperor, who was declared the symbolic leader of the revolt, was later captured and exiled to Rangoon.

• General John Nicholson: A key British commander during the Siege of Delhi, he played a pivotal role in the city's recapture but was mortally wounded in the process.

• Significance of Delhi: As the center of Mughal power, Delhi held immense symbolic and strategic importance for both the rebels and the British.

• Aftermath: The recapture of Delhi marked the beginning of the suppression of the revolt, with other key centers like Kanpur, Lucknow, and Jhansi falling in the following months.

Q47. Answer: (c) 12

Shortcut Trick

For three numbers in continued proportion a, b, c where c is the third proportional:

$b^2 = a \times c$

$Z^2 = 36 \times 4$

$Z = \sqrt{(36 \times 4)} = 6 \times 2 = 12$

Therefore The correct answer is 12.

Alternate Method

Given: First number (a) = 36, Mean proportional (b) = Z, Third proportional (c) = 4.

Formula Used: If a, b, c are in continued proportion, then a/b = b/c.

36

1st (a)
Z
2nd (b)
4
3rd (c)
Ratio: 36/Z = Z/4
=> 36/Z = Z/4
=> Z × Z = 36 × 4
=> Z^2 = 144
=> Z = √144
=> Z = 12
Therefore The correct answer is 12.
Additional Information
Mean Proportional
The mean proportional between two numbers a and b is √(a × b).
Fourth Proportional
If four numbers a, b, c, and d are in proportion (a:b = c:d), then the fourth proportional d = (b × c) ÷ a.
Third Proportional
For numbers a and b, the third proportional c is calculated such that a:b = b:c, which gives c = b^2 ÷ a.

Q48. Answer: (b) -3/16

Given:
Simplify: (2)/(8) + (2)/(8) + (1)/(16) + (2)/(8) - 1
Formula used:
Add all fractions and subtract 1.
Calculation:
(2)/(8) + (2)/(8) + (1)/(16) + (2)/(8) - 1
=> Combine fractions with the same denominator:
=> (2)/(8) + (2)/(8) + (2)/(8) = (6)/(8)
=> Convert (6)/(8) to (12)/(16) for common denominator with (1)/(16):
=> (12)/(16) + (1)/(16) = (13)/(16)
=> (13)/(16) - 1
=> Convert 1 to (16)/(16):
=> (13)/(16) - (16)/(16)
=> = -(3)/(16)
Therefore The correct answer is option (2).

Q49. Answer: (c) 680

Shortcut Trick
Convert percentages to values: 1800% of 10 = 18 × 10 = 180.
Target value = 180 − 10 = 170.
Since 25% (or 1/4) of k is 170, then k = 170 × 4.
k = 680.
Therefore The correct answer is 680.
Alternate Method
Given:
25% of k = (1800% of 10) − 10
=> (25/100) × k = [(1800/100) × 10] − 10
=> 0.25 × k = [18 × 10] − 10
=> 0.25 × k = 180 − 10
=> 0.25 × k = 170
=> k = 170 ÷ 0.25

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=> k = 170 × 4

=> k = 680

Therefore The correct answer is 680.

Additional Information

Percentage to Fraction Conversion

Common conversions: 25% = 1/4, 50% = 1/2, 75% = 3/4, and 100% = 1. To convert x% to a fraction, divide by 100.

Percentage Interchangeability

x% of y is always equal to y% of x. For example, 1800% of 10 is the same as 10% of 1800, which equals 180.

Base Change Property

If a number is reduced by 75% (remaining 25%), to restore it to its original value, it must be increased by 300% (multiplied by 4).

Q50. Answer: (c) 28 : 60

Shortcut Trick

Convert each ratio to approximate decimals to compare quickly.

17 ÷ 53 ≈ 0.32

24 ÷ 54 = 4 ÷ 9 ≈ 0.44

28 ÷ 60 = 7 ÷ 15 ≈ 0.46

16 ÷ 57 ≈ 0.28

Therefore The correct answer is 28 : 60.

Alternate Method

Given Ratios: 17/53, 24/54, 28/60, 16/57

Step 1: Simplify the fractions where possible

=> 24/54 = 4/9 ≈ 0.444

=> 28/60 = 7/15 ≈ 0.466

Step 2: Cross-multiply the two largest candidates (24/54 and 28/60)

=> 24 × 60 = 1440

=> 54 × 28 = 1512

=> Since 1512 > 1440, 28/60 is greater than 24/54.

Step 3: Compare with 17/53 and 16/57

=> 17/53 is roughly 1/3 (0.33), and 16/57 is less than 1/3.

=> 28/60 is almost 1/2 (0.5), making it the greatest.

Therefore The correct answer is 28 : 60.

Additional Information

Cross Multiplication Rule

For two fractions a/b and c/d, if a×d > b×c, then a/b > c/d.

Percentage Conversion

To compare ratios, convert them to percentages by multiplying by 100. For example, 28/60 × 100 ≈ 46.67%.

Common Denominator Method

Convert all ratios to have the same denominator (LCM) and compare the numerators directly.

Q51. Answer: (a) It cycles through the open windows or tabs of the currently active application

The correct answer is It cycles through the open windows or tabs of the currently active application.

Key Points

• Pressing Ctrl + Tab in most graphical operating systems cycles through the open tabs or windows within the currently active application.

• This functionality is widely used in applications such as web browsers (e.g., Google Chrome, Mozilla Firefox) and text editors (e.g., Visual Studio Code).

• It ensures seamless multitasking by quickly switching between multiple tabs or documents without requiring the user to click manually.

• Unlike Alt + Tab, which cycles through all open applications, Ctrl + Tab is specific to the currently active application.

• This feature enhances productivity by allowing users to quickly navigate and manage workflows across different tabs/windows.

Additional Information

• Alt + Tab:

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• This shortcut allows users to switch between all open applications on the system.
• It is commonly used for navigating between different programs quickly, especially in multitasking scenarios.
• Ctrl + W:
• This shortcut is used to close the current tab or window within an application.
• It is particularly useful in web browsers and text editors for closing specific tabs without exiting the entire program.
• Ctrl + N:
• Pressing this combination opens a new tab or window in the currently active application.
• It is often utilized in browsers or document editors to create new workspaces.
• Ctrl + Shift + Tab:
• This shortcut cycles through open tabs/windows in the reverse order of Ctrl + Tab.
• It is helpful when navigating backward through a sequence of open tabs.
• Task Switching in OS:
• Modern operating systems like Windows, macOS, and Linux provide various shortcuts to improve user efficiency when managing multiple applications.
• These shortcuts are designed to reduce dependency on the mouse and enable faster navigation.

Q52. Answer: (b) Damodar

The correct answer is Damodar.

Key Points

• The Damodar River is the primary river system that drains the Chotanagpur Plateau, located in eastern India.
• It flows through the states of Jharkhand and West Bengal, contributing significantly to the region's hydrology.
• The river is often referred to as the "Sorrow of Bengal" due to its history of frequent flooding.
• Major tributaries of the Damodar River include Barakar, Konar, and Bokaro, which originate in the Chotanagpur Plateau.
• The Damodar Valley Corporation (DVC) was established in 1948 to control flooding, provide irrigation, and develop hydroelectric projects along the river.

Additional Information

• Chotanagpur Plateau:
• The plateau spans across Jharkhand, Odisha, and Chhattisgarh and is rich in mineral resources, such as coal, iron ore, and mica.
• It is divided into three sub-regions: Ranchi Plateau, Hazaribagh Plateau, and Pat Plateau.
• The terrain is characterized by rugged hills, valleys, and escarpments, making it a unique geographical region.
• Damodar Valley Corporation (DVC):
• DVC is a multipurpose river valley project established in 1948 for flood control, irrigation, and hydroelectric power generation.
• It manages the Damodar River basin and operates several dams, such as Tilaiya, Konar, Maithon, and Panchet.
• Barakar River:
• The Barakar River is the largest tributary of the Damodar River and originates in the Chotanagpur Plateau.
• It contributes significantly to the water flow in the Damodar River system.
• Flood Management:
• The Damodar River was infamous for annual floods, which devastated agricultural fields and settlements until the establishment of DVC.
• Modern flood management practices have reduced the severity and frequency of flooding in the region.

Q53. Answer: (c) Amir Sarkosh

The correct answer is Amir Sarkosh.

Key Points

• Pankaj Advani, the Indian cue sports champion, defeated Amir Sarkosh in the final to win the 2025 Asian Snooker Championship.
• Amir Sarkosh is a professional snooker player from Iran, known for competing in various international tournaments.
• Pankaj Advani secured his title with a dominant performance, showcasing his exceptional skills and strategic gameplay.
• This victory marked Advani’s continued dominance in cue sports, adding yet another feather to his illustrious career.
• The Asian Snooker Championship is one of the most prestigious tournaments in the sport, attracting top players from across Asia.

Additional Information

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• Pankaj Advani:
• He is an Indian professional billiards and snooker player who holds numerous world titles in cue sports.
• Advani is the only player to have won world titles in both formats—points and timed—in billiards as well as in snooker.
• He has won more than 20 world titles, making him one of the most decorated cue sports players globally.
• Asian Snooker Championship:
• The championship is organized by the Asian Confederation of Billiard Sports (ACBS).
• It serves as a platform for the best players from Asia to compete and showcase their talent.
• The event often includes formats like singles and team competitions.
• Snooker:
• Snooker is a cue sport played on a rectangular table covered with a green cloth called baize.
• The game involves using a cue stick to hit balls into pockets in a strategic sequence.
• It originated in India during the British colonial period and has grown to become a popular sport worldwide.
• Iran in Cue Sports:
• Iran has been emerging as a competitive nation in cue sports, with players like Amir Sarkosh representing the country internationally.
• The country has hosted several regional tournaments and contributes actively to the development of snooker in Asia.

Q54. Answer: (b) Denmark

The correct answer is Denmark.

Key Points

• Denmark ranked fourth in the Human Development Report 2025, recognized for its high standards in education, healthcare, and quality of life.
• The country consistently performs well in the Human Development Index (HDI), which measures key dimensions like life expectancy, education, and per capita income.
• Denmark is known for its progressive policies on social welfare, environmental sustainability, and gender equality, contributing to its high HDI ranking.
• The Danish government invests heavily in public services, ensuring universal access to healthcare and education, which boosts human development metrics.
• Strong economic stability, coupled with a focus on innovation and green energy, further enhances Denmark's human development indicators.

Additional Information

• Human Development Index (HDI):
• The HDI is a composite index created by the United Nations Development Programme (UNDP) to measure a country's social and economic development.
• It includes three dimensions: life expectancy, education (mean years of schooling and expected years of schooling), and GNI per capita.
• Factors Contributing to Denmark's Ranking:
• Denmark's universal healthcare system ensures equitable access to medical facilities for its citizens.
• The country invests heavily in renewable energy, reducing environmental risks and promoting sustainable development.
• Social welfare programs focus on addressing poverty and inequality, improving the overall quality of life.
• Scandinavian Countries' HDI Trend:
• Scandinavian countries like Denmark, Norway, and Sweden often rank high in HDI due to their advanced social policies.
• These nations prioritize education, healthcare, and environmental sustainability.
• Global HDI Rankings:
• Countries like Norway, Switzerland, and Denmark often top the HDI rankings due to their holistic approach toward development.
• Low-ranking countries typically face challenges related to poverty, conflict, and lack of infrastructure.

Q55. Answer: (d) 37

Shortcut Trick

When the Mode of a distribution is equal to the Upper Limit of a class interval, the frequency of that class (f1) must be equal to the frequency of the succeeding class (f2).

Given Mode = 165, which is the upper limit of the class 160−165.

Frequency of class (160−165) = 37.

Frequency of the next class (165−170) = x.

Therefore x = 37.
Therefore The correct answer is 37.
Alternate Method
Given:
Mode = 165
Since 165 lies at the boundary of 160−165 and 165−170, we identify the Modal Class as 160−165.
Lower limit (l) = 160
Frequency of modal class (f1) = 37
Frequency of preceding class (f0) = 26
Frequency of succeeding class (f2) = x
Class width (h) = 5
Formula:
Mode = l + [(f1 − f0) ÷ (2f1 − f0 − f2)] × h
Calculations:
=> 165 = 160 + [(37 − 26) ÷ (2 × 37 − 26 − x)] × 5
=> 165 − 160 = [11 ÷ (74 − 26 − x)] × 5
=> 5 = [11 ÷ (48 − x)] × 5
=> 1 = 11 ÷ (48 − x)
=> 48 − x = 11
=> x = 48 − 11
=> x = 37
Therefore The correct answer is 37.
Additional Information
Empirical Relationship
The relationship between the three measures of central tendency is: Mode = 3 × Median − 2 × Mean.
Median of Grouped Data
Median = l + [((n ÷ 2) − cf) ÷ f] × h, where cf is the cumulative frequency of the class preceding the median class.
Mean of Grouped Data
Mean (μ) = Σ(f_i × x_i) ÷ Σf_i, where x_i is the class mark (mid-point) of each interval.

Q56. Answer: (d) 11 - 22 - 25 - 50

The logic followed here involves a sequence of operations:
Logic: First number to Second number: Multiply by 2.
Second number to Third number: Add 3.
Third number to Fourth number: Multiply by 2.
For, 6 - 12 - 15 - 30
=> 6 × 2 = 12
=> 12 + 3 = 15
=> 15 × 2 = 30
Here, the logic followed.
For, 4 - 8 - 11 - 22
=> 4 × 2 = 8
=> 8 + 3 = 11
=> 11 × 2 = 22
Here, the logic followed.
Option 1) 8 - 16 - 19 - 36
=> 8 × 2 = 16 (Matches First to Second)
=> 16 + 3 = 19 (Matches Second to Third)
=> 19 × 2 = 38 (Given Fourth number is 36, 36 ≠ 38)
Here, logic not followed.
Option 2) 12 - 14 - 28 - 30
=> 12 × 2 = 24 (Given Second number is 14, 14 ≠ 24)

Here, logic not followed.

Option 3) 1 - 2 - 4 - 16

=> 1 × 2 = 2 (Matches First to Second)

=> 2 + 3 = 5 (Given Third number is 4, 4 ≠ 5)

Here, logic not followed.

Option 4) 11 - 22 - 25 - 50

=> 11 × 2 = 22 (Matches First to Second)

=> 22 + 3 = 25 (Matches Second to Third)

=> 25 × 2 = 50 (Matches Third to Fourth)

Here, logic followed.

Hence, the correct answer is "Option 4".

Q57. Answer: (c) 11 3/5

Shortcut Trick

Total Work (LCM of 14, 10) = 70 units.

Efficiency: A = 5, B = 7. 2-day cycle (B + A) = 7 + 5 = 12 units.

5 cycles (10 days) = 12 × 5 = 60 units. Remaining = 70 − 60 = 10 units.

Day 11 (B's turn) = 7 units. Remaining = 10 − 7 = 3 units.

Day 12 (A's turn) takes 3 ÷ 5 = 3/5 day.

Therefore The correct answer is 11 3/5 days.

Alternate Method

Given: Time taken by A = 14 days, Time taken by B = 10 days.

Person	Days	Total Work	Efficiency
A	14	70	5
B	10	7	

=> Total work = LCM(14, 10) = 70 units.

=> Efficiency of A = 70 ÷ 14 = 5 units/day.

=> Efficiency of B = 70 ÷ 10 = 7 units/day.

=> Work done in first 2 days (B then A) = 7 + 5 = 12 units.

=> In 10 days (5 cycles), work completed = 12 × 5 = 60 units.

=> Remaining work = 70 − 60 = 10 units.

=> On 11th day, B works and completes 7 units. Remaining = 10 − 7 = 3 units.

=> On 12th day, A works. Time taken = 3/5 days.

=> Total time = 10 + 1 + 3/5 = 11 3/5 days.

Therefore The correct answer is 11 3/5 days.

Additional Information

Alternate Day Work

When individuals work alternately, calculate the combined work of one full cycle and multiply to get as close to the total work as possible without exceeding it.

Efficiency and Time

Efficiency is inversely proportional to time. Total Work = Efficiency × Time. Using LCM for total work simplifies fractional calculations.

Q58. Answer: (b) 51

Given interchange rules:

• '÷' and '−' are interchanged.

• '×' and '+' are interchanged.

The given equation is:

89 ÷ 4984 − 89 × 9 + 2 = ?

Replace the operators with their corresponding new meanings:

89 − 4984 ÷ 89 + 9 × 2 = ?

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Now, we solve the equation following the BODMAS rule:

= 89 − 4984 ÷ 89 + 9 × 2

= 89 + 18 − 56

= 107 − 56

= 51

Hence, the correct answer is "Option 2".

Q59. Answer: (a) 6,003

Shortcut Trick

When Profit% = Loss% for two selling prices, the Cost Price (CP) is the average of those two prices.

CP = (6833 + 1447) ÷ 2 = 8280 ÷ 2 = 4140.

To make a 45% profit, required SP = CP × 1.45.

SP = 4140 × 145 ÷ 100 = 41.4 × 145 = 6003.

Therefore The correct answer is Rs. 6,003.

Alternate Method

Given: SP1 = Rs. 6,833, SP2 = Rs. 1,447, Profit% = Loss%, Desired Profit% = 45%.

Formulas: CP = (SP1 + SP2) ÷ 2 (if Profit% = Loss%), SP = CP × (100 + P%) ÷ 100.

=> Let Cost Price be x.

=> Profit% = [(6833 − x) ÷ x] × 100 and Loss% = [(x − 1447) ÷ x] × 100.

=> 6833 − x = x − 1447 => 2x = 8280 => x = 4140.

=> New Selling Price = 4140 × (100 + 45) ÷ 100 = 4140 × 1.45.

=> New SP = 6003.

Therefore The correct answer is Rs. 6,003.

Additional Information

Cost Price when Profit = Loss

When numerical profit equals numerical loss for two different selling prices, the CP is always the arithmetic mean of those prices: CP = (SP_(high) + SP_(low)) ÷ 2.

Calculating Profit Selling Price

To calculate a specific profit percentage P%, use the multiplier: SP = CP × (1 + P ÷ 100).

Q60. Answer: (a) Reserve Bank of India

The correct answer is Reserve Bank of India.

Key Points

• On 4 April 2025, the Reserve Bank of India (RBI) launched a verified WhatsApp channel to provide financial updates to the public.

• This initiative aims to enhance communication and engagement with the general public using a widely used messaging platform.

• The RBI's verified WhatsApp channel will offer updates on policy changes, announcements, and financial literacy topics.

• Subscribers to this channel will receive real-time and authenticated information directly from the RBI.

• This move reflects the RBI's efforts to leverage digital platforms for transparency and accessibility in financial communication.

Additional Information

• Reserve Bank of India (RBI):

• Established on 1 April 1935, RBI is India's central banking institution.

• It regulates monetary policy and ensures financial stability in India.

• The RBI also oversees currency issuance, foreign exchange management, and banking operations.

• WhatsApp Channels:

• Introduced by WhatsApp, channels are a feature for broadcasting information to large audiences.

• Channels allow organizations to communicate with users in a controlled and verified manner.

• Digital Communication in Banking:

• Indian banks increasingly use social media and digital platforms for customer engagement.

• Such initiatives aim to improve financial literacy and accessibility for users.

• Financial Updates:

• Information shared through these channels includes policy changes, interest rates, schemes, and global financial trends.

• The goal is to ensure timely dissemination of information to the public.

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Q61. Answer: (b) 46

Shortcut Trick

Let the HCF be x. The numbers are 1x, 15x, and 7x.

Ratio of numbers = 1 : 15 : 7. Since 1, 15, and 7 are co-prime (their LCM is their product).

LCM = 1 × 15 × 7 × x = 105x.

Given 105x = 4830 => x = 4830 ÷ 105 = 46.

Therefore The correct answer is 46.

Alternate Method

Given: Ratio = 1 : 15 : 7, LCM = 4830.

Formula: LCM of numbers (ax, bx, cx) = x × LCM(a, b, c), where x is the HCF.

=> Let the numbers be x, 15x, and 7x.

=> LCM(x, 15x, 7x) = x × LCM(1, 15, 7)

=> LCM(1, 15, 7) = 1 × 3 × 5 × 7 = 105

=> 105x = 4830

=> x = 4830 ÷ 105

=> x = 46

Therefore The correct answer is 46.

Additional Information

HCF and LCM Relation

For two numbers A and B, HCF × LCM = A × B. This property is only strictly applicable to two numbers.

Ratio and Multiples

If the ratio of n numbers is a : b : c and their HCF is x, then the numbers are ax, bx, and cx. Their LCM is x × LCM(a, b, c).

Co-prime Numbers

Numbers whose HCF is 1 are called co-prime. The LCM of co-prime numbers is simply their product.

Q62. Answer: (d) B

Given:

A, B, C, D, G, H and I are sitting around a circular table facing the centre of the table.

Only three people sit between I and H when counted from the left of I.

Only three people sit between A and G when counted from the right of G.

C sits to the immediate right of A.

B is an immediate neighbour of G as well as H.

Thus, B sits to the second to the left of D.

Hence, the correct answer is "Option 4".

Q63. Answer: (b) Electro-Magnetic Launch System (EMLS)

The correct answer is Electro-Magnetic Launch System (EMLS).

Key Points

• The Electro-Magnetic Launch System (EMLS) is a cutting-edge technology unveiled by the DRDO for the Indian Navy to enhance aircraft launch capabilities.

• EMLS employs electromagnetic force to launch aircraft from naval carriers, replacing conventional steam catapults.

• This technology provides greater efficiency, precision, and flexibility in launching heavier and advanced aircraft.

• EMLS is aligned with India's efforts to modernize naval aviation and boost indigenous defense capabilities under the "Atmanirbhar Bharat" initiative.

• It is a critical component for operating advanced fighters and unmanned aerial vehicles (UAVs) from aircraft carriers.

Additional Information

• Electromagnetic Aircraft Launch System (EMALS):

• EMALS, developed by the US Navy, is a similar system that uses electromagnetic energy to launch aircraft.

• It offers a smoother acceleration compared to steam catapults, reducing wear and tear on aircraft.

• Advantages of EMLS:

• Improved energy efficiency and reduced maintenance costs compared to steam-based systems.

• Capable of launching a wide range of aircraft, from lightweight UAVs to heavy fighter jets.

• Provides scalability and adaptability for future advanced aircraft designs.

• Indian Navy's Aircraft Carriers:

• India currently operates INS Vikramaditya and recently commissioned INS Vikrant, both of which will benefit from advanced launch systems like EMLS.

• Atmanirbhar Bharat in Defense:

• The DRDO's development of EMLS reflects India's commitment to self-reliance in defense technologies.

• It reduces dependency on foreign suppliers and strengthens the domestic defense manufacturing ecosystem.

Q64. Answer: (b) Support of guard cells in stomatal function

The correct answer is Support of guard cells in stomatal function.

Key Points

• Subsidiary cells are specialized epidermal cells that are associated with guard cells and help in stomatal function.

• They play an indirect role in regulating the opening and closing of stomata by providing mechanical support to guard cells.

• Subsidiary cells contribute to maintaining the ion balance and turgor pressure required for guard cells to function effectively.

• These cells are part of the stomatal complex, which is crucial for gas exchange and transpiration in plants.

• The presence of subsidiary cells varies among plant species and is a characteristic feature used for plant identification.

Additional Information

• Stomata:

• Stomata are microscopic pores present on the surface of leaves and stems that facilitate gas exchange (CO_2 intake and O_2 release).

• They are surrounded by guard cells, which regulate their opening and closing based on environmental conditions.

• Guard Cells:

• Guard cells are specialized cells that control the size of the stomatal pore by changing their shape.

• They respond to factors like light, water availability, and internal CO_2 concentration.

• Subsidiary Cells:

• Subsidiary cells are part of the epidermis and surround guard cells, forming the stomatal complex.

• They vary in shape, size, and arrangement depending on the plant species.

• Function of Stomatal Complex:

• Facilitates transpiration and cooling of the plant.

• Plays a key role in photosynthesis by enabling CO_2 uptake.

• Helps maintain the plant's water balance by regulating water loss.

Q65. Answer: (d) Kunal Kemmu

The correct answer is Kunal Kemmu.

Key Points

• Kunal Kemmu won the Best Directorial Debut award for his movie 'Madgaon Express' at the IIFA Awards 2025.

• The movie 'Madgaon Express' marked Kunal Kemmu's debut as a director, showcasing his storytelling and cinematic skills.

• 'Madgaon Express' received widespread appreciation for its unique narrative and engaging storyline, contributing to Kunal Kemmu's success at IIFA.

• The IIFA Awards are among the most prestigious awards in the Indian film industry, recognizing outstanding contributions and talent.

• Kunal Kemmu's transition from being a successful actor to a director was highly celebrated, with 'Madgaon Express' being considered a remarkable first effort.

Additional Information

• IIFA Awards:

• The International Indian Film Academy Awards (IIFA) were established in 2000 to celebrate excellence in the Indian film industry.

• IIFA events are held at various international locations to promote Indian cinema globally.

• The awards recognize achievements in categories such as acting, directing, music, and technical excellence.

• Directorial Debut:

• A directorial debut refers to the first movie or project directed by an individual, marking their entry into the field of direction.

• It is often a significant milestone in a filmmaker's career, showcasing their creative vision and storytelling abilities.

• Kunal Kemmu:

• Kunal Kemmu is a well-known actor in the Indian film industry, recognized for his performances in movies such as 'Go Goa Gone' and 'Kalank.'

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• His directorial debut with 'Madgaon Express' highlighted his versatility as a storyteller.

• 'Madgaon Express':

• The movie is set against the backdrop of a train journey, weaving a compelling narrative that resonated with audiences.

• It gained attention for its innovative storytelling and strong performances by the cast.

Q66. Answer: (c) YAC

The logic followed in this pattern is a consistent alphabetical shift for each letter position: +1, +2, +3.

For 'JKL' related to 'KMO':

For 'PQR' related to 'QSU':

The consistent pattern observed is: +1, +2, +3.

Applying the same logic to 'XYZ':

Thus, 'XYZ' is related to YAC.

Hence, the correct answer is "Option 3".

Q67. Answer: (a) Complete combustion of fuel

The correct answer is Complete combustion of fuel.

Key Points

• The blue flame of a gas stove indicates complete combustion of fuel, which occurs when the fuel burns efficiently with a sufficient oxygen supply.

• Complete combustion results in the production of carbon dioxide (CO2) and water vapor (H2O), without releasing harmful gases like carbon monoxide (CO).

• A blue flame is a sign of optimal energy efficiency, as the fuel is fully utilized without wastage.

• Incomplete combustion, on the other hand, produces a yellow or orange flame and may release pollutants like carbon monoxide (CO).

• Blue flames are common when burning fuels like natural gas, propane, or butane, which are hydrocarbons.

Additional Information

• Complete Combustion: A chemical process where a fuel reacts with oxygen to produce carbon dioxide, water, and energy. It requires a sufficient oxygen supply.

• Incomplete Combustion: Occurs when there is insufficient oxygen, leading to the production of harmful by-products such as carbon monoxide and soot.

• Hydrocarbons: Organic compounds consisting of hydrogen and carbon atoms. Common fuels like natural gas and propane are hydrocarbons.

• Carbon Monoxide (CO): A toxic gas produced during incomplete combustion. It is colorless, odorless, and can pose serious health risks.

• Energy Efficiency: Blue flames are an indicator of efficient energy usage, as the fuel is completely burned without wasting resources.

Q68. Answer: (b) Meerut

The correct answer is Meerut.

Key Points

• The Revolt of 1857 began on 10th May 1857 in Meerut, located in present-day Uttar Pradesh, India.

• The immediate cause was the resentment among sepoys over the use of greased cartridges, which were rumored to be coated with cow and pig fat, offending both Hindu and Muslim religious sentiments.

• The sepoys of the East India Company stationed in Meerut refused to use the cartridges, leading to their court-martial, which ignited the rebellion.

• After revolting, the sepoys marched to Delhi and declared Bahadur Shah II, the last Mughal emperor, as their symbolic leader to unite Indians against British rule.

• The uprising in Meerut marked the beginning of the larger struggle, which spread to various parts of India such as Kanpur, Lucknow, and Jhansi.

Additional Information

• Causes of the Revolt:

• Political Causes: Policies like the Doctrine of Lapse and Subsidiary Alliance alienated Indian rulers.

• Economic Causes: Exploitative land revenue systems and destruction of traditional industries hurt Indian peasants and artisans.

• Social and Religious Causes: Reforms like the abolition of Sati and the introduction of the Widow Remarriage Act created distrust among conservative Indians.

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• Key Leaders of the Revolt:

• Rani Lakshmibai in Jhansi, Tantia Tope in Kanpur, and Begum Hazrat Mahal in Lucknow played significant roles in leading the rebellion.

• Outcome of the Revolt:

• The revolt was eventually suppressed by the British, and the East India Company was abolished in 1858.

• India came under the direct control of the British Crown, marking the beginning of the British Raj.

• Historical Significance:

• The Revolt of 1857 is often regarded as India's First War of Independence, despite its failure.

• It sowed the seeds for future resistance movements against British colonial rule.

Q69. Answer: (d) Competition Commission

The correct answer is Competition Commission.

Key Points

• Since December 2022, the functions of the National Anti-Profiteering Authority (NAA), set up in connection with GST reforms, have been transferred to the Competition Commission of India (CCI).

• The Competition Commission of India (CCI) is responsible for ensuring fair competition and preventing anti-competitive practices in the market.

• The decision to transfer NAA's functions to CCI was made to streamline operations and leverage CCI's expertise in handling anti-profiteering cases.

• The CCI's role includes investigating complaints related to unfair pricing and profiteering under GST regulations and ensuring compliance with legal norms.

• This shift aligns with the government's aim to create a unified regulatory framework for anti-profiteering and competition issues.

Additional Information

• National Anti-Profiteering Authority (NAA):

• NAA was established under GST reforms to ensure that the benefits of tax rate reductions or input tax credits were passed on to consumers.

• Its primary function was to address complaints regarding profiteering and unfair pricing practices by businesses under GST.

• It investigated cases where businesses failed to transfer GST benefits to end consumers.

• Competition Commission of India (CCI):

• CCI was established under the Competition Act, 2002, to prevent practices that have an adverse effect on competition.

• It ensures fair competition in the market, protects consumer interests, and promotes economic efficiency.

• CCI handles cases related to anti-competitive agreements, abuse of dominant positions, and combinations (e.g., mergers and acquisitions).

• GST (Goods and Services Tax):

• GST is a unified indirect tax introduced in India on July 1, 2017, replacing multiple indirect taxes such as VAT, service tax, and excise duty.

• It is categorized into CGST, SGST, and IGST, depending on the transaction's nature.

• GST aims to simplify the tax structure, promote ease of doing business, and prevent cascading effects of taxation.

• Anti-Profiteering Measures:

• These measures are designed to ensure that businesses pass the benefits of tax rate reductions or input tax credits to consumers.

• They focus on preventing unfair pricing practices and maintaining transparency in consumer transactions.

• Such measures play a vital role in building consumer trust and ensuring compliance with GST provisions.

Q70. Answer: (c) JG-NK-RT

The logic followed here is:

NK : RO : VX

LI : PM : TV

Option 1: IG-NL-RU

This option does NOT follow the pattern.

Option 2: IG-NK-RU

This option does NOT follow the pattern.

Option 3: JG-NK-RT

This option follows the pattern.

Option 4: JG-NK-RU

This option does NOT follow the pattern.

Hence, the correct answer is "Option 3".

Q71. Answer: (c) 10 √3 meter

Shortcut Trick

In a 30°−60°−90° right-angled triangle, the ratio of sides opposite to these angles is 1 : √3 : 2.

Here, the side adjacent to 30° (base) corresponds to √3 units and the side opposite to 30° (height) corresponds to 1 unit.

√3 units = 30 m

1 unit = 30 ÷ √3 = (10 × 3) ÷ √3 = 10√3 m.

Therefore The correct answer is 10√3 m.

Alternate Method

Given: Distance from tower (Base) = 30 m, Angle of elevation (θ) = 30°.

Formula Used: tan θ = Perpendicular (Height) ÷ Base

=> tan 30° = Height ÷ 30

=> 1/√3 = Height ÷ 30

=> Height = 30 ÷ √3

=> Height = (30 × √3) ÷ (√3 × √3)

=> Height = 30√3 ÷ 3 = 10√3 m

Therefore The correct answer is 10√3 m.

Additional Information

Trigonometric Ratios

Standard values for tan are tan 30° = 1/√3, tan 45° = 1, and tan 60° = √3.

Angle of Elevation vs Depression

The angle of elevation is the angle between the horizontal line and the line of sight when looking up. The angle of depression is the same angle when looking down from the top.

Q72. Answer: (b) Indo-Gangetic Plains

The correct answer is Indo-Gangetic Plains.

Key Points

• The Indo-Gangetic Plains are one of the most fertile agricultural regions in India, supporting the rice-wheat cropping system.

• This cropping system is practiced in states like Punjab, Haryana, Uttar Pradesh, and Bihar due to favorable climate and soil conditions.

• Rice is grown during the Kharif season (monsoon) as it requires a significant amount of water, while wheat is cultivated in the Rabi season (winter).

• The alluvial soil of the Indo-Gangetic Plains, coupled with abundant water resources from rivers like the Ganga and its tributaries, makes the region ideal for this cropping system.

• This system contributes significantly to India's food security, with the region being called the "Granary of India."

Additional Information

• Kharif Crops:

• These are crops grown during the monsoon season (June to October) and include rice, maize, and millets.

• Rice is the most prominent Kharif crop in the Indo-Gangetic Plains due to the high water availability during this period.

• Rabi Crops:

• These are crops grown in the winter season (November to April), such as wheat, barley, and mustard.

• Wheat cultivation in the Rabi season complements rice, forming the rice-wheat cropping pattern in the Indo-Gangetic Plains.

• Alluvial Soil:

• The Indo-Gangetic Plains are rich in alluvial soil, brought by rivers like the Ganga, Yamuna, and their tributaries.

• This soil is highly fertile and suitable for growing a wide variety of crops, including rice and wheat.

• Food Security in India:

• The rice-wheat cropping system in the Indo-Gangetic Plains contributes significantly to India's food grain production.

• This region plays a critical role in ensuring food security for the country, feeding millions of people.

• Green Revolution:

• The Indo-Gangetic Plains were a major beneficiary of the Green Revolution in the 1960s-70s, which introduced high-yield variety

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seeds and improved irrigation methods.

• This led to a significant increase in the productivity of rice and wheat in the region.

Q73. Answer: (b) Mauritius

The correct answer is Mauritius.

Key Points

• PM Narendra Modi visited Mauritius in March 2025 to attend its 57th National Day celebrations.

• The visit symbolized India’s commitment to maintaining strong diplomatic and cultural ties with Mauritius, a country with a significant Indian diaspora.

• Mauritius celebrates its National Day every year on March 12th, commemorating its independence from Britain in 1968 and becoming a republic in 1992.

• India and Mauritius share close bilateral relations, including cooperation in areas such as trade, investment, health, education, and defense.

• During the visit, PM Modi emphasized India's support for Mauritius in its development projects, including the Metro Express and the Supreme Court building, funded through Indian grants.

Additional Information

• India-Mauritius Bilateral Relations:

• India is Mauritius’ largest trading partner and has been a significant source of Foreign Direct Investment (FDI) for the country.

• The Comprehensive Economic Cooperation and Partnership Agreement (CECPA) was signed between the two nations to enhance trade and investment.

• Mauritius is considered a key strategic partner in the Indian Ocean region.

• Indian Diaspora in Mauritius:

• Mauritius has a large Indian-origin population, making up approximately 68% of its total population.

• The Indian community in Mauritius has preserved its cultural heritage, including festivals, language, and traditions.

• Metro Express Project:

• India provided financial assistance for the Metro Express Project, aimed at improving public transport infrastructure in Mauritius.

• The project strengthens urban connectivity and fosters economic growth in the region.

• Defense Cooperation:

• India has supported Mauritius in enhancing its maritime security by supplying patrol vessels and providing training to its naval personnel.

• This cooperation aligns with India's vision of ensuring peace and stability in the Indian Ocean region.

Q74. Answer: (c) HDVW

The logic followed here is:

Option (1): AWRP

Option (2): JFAY

Option (3): HDVW

Option (4): RNIG

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

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

Q75. Answer: (b) Gram Sabha

The correct answer is Gram Sabha.

Key Points

• The Gram Sabha is the cornerstone of the Panchayati Raj system as established by the 73rd Constitutional Amendment Act, 1992.

• It consists of all the registered voters of a village or a group of villages within the jurisdiction of a Panchayat.

• Gram Sabha ensures direct participation of the community in decision-making, empowering local governance.

• Key functions of the Gram Sabha include approving village development plans, monitoring the implementation of projects, and ensuring transparency in Panchayat operations.

• It serves as the ultimate authority in the Panchayati Raj system, promoting democratic decentralization at the grassroots level.

Additional Information

• 73rd Constitutional Amendment Act, 1992:

• This Act provided constitutional status to Panchayati Raj institutions, ensuring decentralized governance.

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• It mandates the establishment of Gram Sabha in each village or group of villages.
• Three-tier structure of Panchayati Raj: Gram Panchayat (village level), Panchayat Samiti (block level), and Zila Parishad (district level).
• Nyaya Panchayat:
• Nyaya Panchayats are judicial bodies functioning to resolve minor disputes at the village level.
• They are distinct from Gram Panchayats and focus solely on justice delivery.
• Zila Parishad:
• Zila Parishad operates at the district level, coordinating activities between block-level Panchayats.
• It formulates development plans and oversees their implementation across the district.
• Gram Panchayat:
• Gram Panchayats are executive bodies at the village level responsible for implementing developmental schemes.
• They work under the supervision of the Gram Sabha.

Q76. Answer: (a) Task View

The correct answer is Task View.

Key Points

• Task View is a feature in Windows 11 that allows users to manage and switch between multiple open windows and virtual desktops.
• It is accessible via the Task View button on the taskbar, represented by an icon showing two overlapping squares.
• Users can create and manage virtual desktops for better organization, separating workspaces for different tasks or projects.
• Task View displays a clear thumbnail preview of all open windows, making multitasking more efficient.
• This feature was first introduced in Windows 10 and has been refined further in Windows 11 for enhanced usability.

Additional Information

• Virtual Desktop:
• It is a feature that allows users to create multiple desktops, each with its own set of open applications and windows.
• Useful for separating tasks such as work, gaming, or entertainment.
• In Windows 11, desktops can be customized with different wallpapers for better distinction.
• Snap Layouts:
• Windows 11 introduced Snap Layouts, a feature that allows users to organize open windows into predefined layouts for multitasking.
• Snap Assist helps users quickly fill remaining space in the layout with other open applications.
• Taskbar Improvements:
• The taskbar in Windows 11 has been redesigned for better accessibility and functionality.
• Features like pinned apps, notification center, and quick settings are integrated into the taskbar.
• Alt+Tab Shortcut:
• A keyboard shortcut used to quickly switch between open windows.
• In Windows 11, Alt+Tab includes a preview of open tabs from Microsoft Edge.

Q77. Answer: (d) 120

Shortcut Trick

Sum of exterior angles of any regular polygon is always 360°.

Sum of interior angles = 100% more than 360° = 2 × 360° = 720°.

Using the formula (n − 2) × 180° = 720° => n − 2 = 4 => n = 6.

The polygon is a regular hexagon.

Each interior angle x = 720° ÷ 6 = 120°.

Therefore The correct answer is 120.

Alternate Method

Given: Sum of interior angles = Sum of exterior angles + 100% of Sum of exterior angles.

Formula Used: Sum of interior angles = (n − 2) × 180°; Sum of exterior angles = 360°.

=> Sum of exterior angles = 360°

=> Sum of interior angles = 360° + (100/100) × 360° = 720°

=> (n − 2) × 180° = 720°

=> n − 2 = 720 ÷ 180

=> n − 2 = 4

=> n = 6 (The polygon is a regular hexagon)

=> Each interior angle x = 720° ÷ 6 = 120°

Therefore The correct answer is 120.

Additional Information

Sum of Interior Angles

The sum of the interior angles of a polygon with n sides is given by (n − 2)

Q78. Answer: (c) 3

Given series:

(Left) 8 * * € 6 % 3 2 $ # 9 9 9 2 @ # 5 3 % 9 @ 1 (Right)

Condition to be checked:

Number → Number → Symbol

8 * * € 6 % 3 2 $ # 9 2 @ # 5 3 % 9 @ 1

There are three such numbers in the above arrangement (3 2 $, 9 2 @, 5 3 %).

Hence, the correct answer is "Option 3".

Q79. Answer: (d) 6

The given code language is:

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

Hence, the correct answer is "Option 4".

Q80. Answer: (c) Three

Given:

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

D sits third to the right of C. C sits to the immediate left of F.

A sits second to the right of B.

B is not an immediate neighbour of C.

G sits to the immediate right of F.

Thus, 3 people sit between G and E when counted from the left of G.

Hence, the correct answer is "Option 3".

Q81. Answer: (d) 6

The correct answer is Option 4 (6 religious communities).

Key Points

• The Citizenship Amendment Act (CAA) 2019 covers 6 religious communities: Hindus, Sikhs, Buddhists, Jains, Parsis, and Christians.

• The act aims to provide Indian citizenship to persecuted religious minorities from Pakistan, Bangladesh, and Afghanistan who entered India on or before 31 December 2014.

• It applies to individuals who faced religious persecution in these countries and were forced to migrate to India.

• The CAA excludes Muslims from its purview, as it focuses on non-Muslim minorities.

• The law does not alter the existing process of acquiring citizenship for others but facilitates faster citizenship for persecuted minorities.

Additional Information

• Definition of Citizenship: Citizenship refers to the legal status granted to an individual by a country, entitling them to certain rights and responsibilities.

• Religious Persecution: It refers to systematic mistreatment or oppression based on religious beliefs, often forcing affected individuals to flee their country.

• Countries Covered: The CAA specifically applies to refugees from Pakistan, Bangladesh, and Afghanistan, which are predominantly Muslim-majority nations.

• Criticism of CAA: Critics argue that the act violates the secular fabric of the Indian Constitution by excluding Muslims and raises concerns about discrimination.

• NRC Connection: The CAA has been linked to the proposed National Register of Citizens (NRC), which aims to identify illegal immigrants. However, the relationship between the two remains a contentious issue.

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Q82. Answer: (d) Capital punishment

The correct answer is Capital punishment.

Key Points

• Capital punishment, also known as the death sentence, when passed by a Sessions Judge, requires mandatory confirmation by the High Court as per Section 366(1) of the Code of Criminal Procedure (CrPC).

• The Sessions Judge cannot execute the death sentence unless it is confirmed by the High Court, ensuring a higher level of judicial scrutiny.

• This procedural safeguard is implemented to ensure that the decision to impose capital punishment undergoes rigorous evaluation to prevent miscarriage of justice.

• Capital punishment is considered the most severe form of punishment and is reserved for rarest of rare cases such as heinous crimes.

• The High Court reviews the legality, validity, and appropriateness of the death sentence passed by the Sessions Court before issuing confirmation.

Additional Information

• Code of Criminal Procedure (CrPC):

• The CrPC is the main legislation governing criminal procedures in India.

• Under Section 366(1), it mandates High Court confirmation for death sentences imposed by Sessions Judges.

• Rare Cases Doctrine:

• Capital punishment in India is awarded only in the "rarest of rare cases" as established by the Supreme Court in the landmark case of Bachan Singh v. State of Punjab (1980).

• This doctrine ensures that death sentences are given only for exceptionally heinous crimes with sufficient justification.

• Judicial Safeguards:

• Mandatory High Court confirmation acts as a safeguard against errors or biases in lower court decisions.

• It ensures that the decision undergoes detailed scrutiny by experienced judges.

• Execution Process:

• Once the High Court confirms the death sentence, the convict has the right to appeal to the Supreme Court.

• Additionally, the convict can file a mercy petition to the President of India under Article 72 of the Constitution or to the Governor under Article 161.

Q83. Answer: (c) 65^0

Shortcut Trick

Sum of adjacent angles in a parallelogram is always 180°.

Let the adjacent angle be x.

x + (4/5 × x − 27°) = 180°

9/5 × x = 207°

x = 115°

Smallest angle = 180° − 115° = 65°.

Therefore The correct answer is 65°.

Alternate Method

Given:

One angle = 4/5 × (adjacent angle) − 27°

Formula Used:

In a parallelogram, the sum of any two adjacent angles is 180° (supplementary angles).

Calculations:

Let the adjacent angle be A.

Let the other angle be B.

=> B = (4/5)A − 27

=> A + B = 180 (Sum of adjacent angles)

=> A + (4/5)A − 27 = 180

=> (9/5)A = 180 + 27

=> (9/5)A = 207

=> A = (207 × 5) ÷ 9

=> A = 23 × 5 = 115°

=> B = 180° − 115° = 65°

Comparing 115° and 65°, the smallest angle is 65°.

Therefore The correct answer is 65°.

Additional Information

Properties of a Parallelogram

Opposite sides are parallel and equal in length. Opposite angles are equal, and consecutive angles are supplementary (sum to 180°).

Diagonals of a Parallelogram

The diagonals of a parallelogram bisect each other, meaning they cut each other into two equal parts at their point of intersection.

Area of a Parallelogram

The area is calculated as Base × Height, or using trigonometry as a × b × sin(θ), where a and b are adjacent sides and θ is the included angle.

Q84. Answer: (d) 33 : 161 : 96

Shortcut Trick

Initial Ratio of Salaries = 3 : 10 : 8

Applying percentage increments directly: 3 × 110% : 10 × 161% : 8 × 120%

New Ratio = 330 : 1610 : 960

Simplifying by dividing by 10 = 33 : 161 : 96

Therefore The correct answer is 33 : 161 : 96.

Alternate Method

Given: Initial ratio of salaries A : B : C = 3 : 10 : 8. Increments = 10%, 61%, 20%.

Formula Used: New Value = Original Value × (100 + Increment %)/100

A (300)

B (1000)

C (800)

+10%

+61%

+20%

330

1610

960

=> Let salaries be 300, 1000, and 800 respectively.

=> New salary of A = 300 + (10% of 300) = 300 + 30 = 330.

=> New salary of B = 1000 + (61% of 1000) = 1000 + 610 = 1610.

=> New salary of C = 800 + (20% of 800) = 800 + 160 = 960.

=> New Ratio = 330 : 1610 : 960 = 33 : 161 : 96.

Therefore The correct answer is 33 : 161 : 96.

Additional Information

Ratio and Percentage Increase

When every term in a ratio is increased by different percentages, multiply each term by its respective multiplying factor (1 + r/100).

Compound Ratio

The ratio resulting from the multiplication of two or more ratios is called the compound ratio. For a : b and c : d, it is (a×c) : (b×d).

Scaling Ratios

Ratios can be scaled up (multiplied by 10, 100, etc.) to make percentage calculations easier without changing the underlying value.

Q85. Answer: (a) 0.9

Shortcut Trick

Ratio of Speed of Boat (u) : Speed of Stream (v) = 8 : 7

Upstream Speed (u−v) = 8 − 7 = 1 unit | Downstream Speed (u+v) = 8 + 7 = 15 units

Given 1 unit = 40.6 km ÷ (27/60) hours = 90.22 kmph (approx calculation not needed)

Total Time = (77.7 ÷ 1 unit) + (52.5 ÷ 15 units) = 77.7 + 3.5 = 81.2 units of time relative to upstream

Calculating Actual Time: (81.2 × 27) ÷ (40.6 × 60) = 0.9 hours

Therefore The correct answer is 0.9 hours.

Alternate Method

Given: Upstream Distance = 40.6 km, Time = 27 min = 27/60 hours

Formula: Speed = Distance ÷ Time; Upstream Speed = u − v; Downstream Speed = u + v

=> Upstream Speed = 40.6 ÷ (27/60) = (40.6 × 60) ÷ 27 = 2436 ÷ 27 = 270.66/3 kmph

=> Let Speed of Boat = 8x and Speed of Stream = 7x

=> Upstream Speed (u − v) = 8x − 7x = x

=> x = 40.6 × (60/27) = 243.6 ÷ 2.7 = 90.22... kmph

=> Downstream Speed (u + v) = 8x + 7x = 15x

=> Total Time = (77.7 ÷ x) + (52.5 ÷ 15x)

=> Total Time = (77.7 ÷ x) + (3.5 ÷ x) = 81.2 ÷ x

=> Total Time = 81.2 ÷ [40.6 × (60/27)] = (81.2 × 27) ÷ (40.6 × 60)

=> Total Time = 2 × (27/60) = 54 ÷ 60 = 0.9 hours

Therefore The correct answer is 0.9 hours.

Additional Information

Upstream and Downstream Speed

Upstream speed = u − v and Downstream speed = u + v, where u is speed in still water and v is stream speed.

Speed in Still Water from U & D

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

Speed of Stream from U & D

Speed of stream (v) = (Downstream − Upstream) ÷ 2.

Q86. Answer: (b) Pushyamitra

The correct answer is Pushyamitra.

Key Points

• Pushyamitra Shunga was the founder of the Shunga dynasty, not associated with the Mauryan Empire.

• The Mauryan Empire ended when Pushyamitra Shunga, a Brahmin army commander under the last Mauryan ruler Brihadratha, assassinated him and established the Shunga dynasty in 185 BCE.

• Pushyamitra Shunga ruled mainly in the central Indian region and is known for his patronage of Brahmanical traditions, contrasting with the largely Buddhist Mauryan rulers.

• The other names mentioned (Samprati, Devavarman, Brihadratha) were Mauryan rulers who succeeded Ashoka and ruled during the decline of the Mauryan Empire.

Additional Information

• Mauryan Empire:

• Founded by Chandragupta Maurya in 321 BCE, it was one of the largest empires in ancient India.

• It reached its zenith under Ashoka, who embraced Buddhism and spread it across Asia.

• The Mauryan administration was highly centralized, with a well-organized bureaucracy.

• Decline of the Mauryan Empire:

• After Ashoka's death, the empire weakened due to succession issues and administrative inefficiencies.

• The later Mauryan rulers like Brihadratha were unable to maintain the empire's stability.

• Shunga Dynasty:

• Founded by Pushyamitra Shunga in 185 BCE after the assassination of Brihadratha.

• The Shunga dynasty is known for reviving Brahmanical traditions and opposing the spread of Buddhism.

• Historical Context:

• The transition from the Mauryan to the Shunga dynasty marks a significant shift in Indian history, especially in religious and administrative practices.

Q87. Answer: (d) 42.47%

Shortcut Trick

Combine first two discounts: 6 + 28 − (6 × 28) ÷ 100 = 34 − 1.68 = 32.32%.

Combine result with third discount: 32.32 + 15 − (32.32 × 15) ÷ 100.

=> 47.32 − 4.848 = 42.472%.

Rounding up to two decimal places, we get 42.47%.

Therefore The correct answer is 42.47%.

Alternate Method

Given → Discounts are 6%, 28%, and 15%.

Formulas: Net SP = MP × (100 − d1)% × (100 − d2)% × (100 − d3)% | Single Discount% = (MP − SP) ÷ MP × 100.

=> Let Marked Price (MP) be 100.

=> Final Selling Price (SP) = 100 × (94 ÷ 100) × (72 ÷ 100) × (85 ÷ 100).

=> SP = 100 × 0.94 × 0.72 × 0.85 = 57.528.

=> Single Equivalent Discount = 100 − 57.528 = 42.472%.

=> Rounding to two decimal places, we get 42.47%.

Therefore The correct answer is 42.47%.

Additional Information

Successive Discount Formula

For two discounts a% and b%, the single effective discount is (a + b − ab/100)%.

Marked Price & Discount

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

Q88. Answer: (b) 14

The given three-digit numbers are: 740, 636, 787, 884, 316.

Now,

The highest number is 884. Its second digit is 8.

The lowest number is 316. Its third digit is 6.

Addition

8 + 6

= 14.

Hence, the correct answer is "Option 2".

Q89. Answer: (b) 1

Given: A, B, C, D, E and F live on six different floors of the same building.

1) A lives on an odd numbered floor but not 3.

2) The sum of floors on which C and A live is 4.

Therefore, A lives on Floor 1 and C lives on Floor 3.

6	
5	
4	
3	C
2	
1	A

3) The sum of floors on which D and E live is 10. (4, 6) or (6, 4)

4) Only 3 people live between E and F.

case 1: E is on Floor 4. If 3 people live between E and F, then F must be on Floor 1. But A is already on Floor 1. So, this subcase is not possible.

case 2: E is on Floor 6. If 3 people live between E and F, then F must be on Floor 2. This is possible.

Therefore, E lives on Floor 6 and F lives on Floor 2.

6	**E**
5	
4	
3	C

2	F
1	A

5) B lives immediately above D.

6	**E**
5	B
4	D
3	C
2	F
1	A

Therefore, One person lives below F.

Hence, the correct answer is "Option 2".

Q90. Answer: (a) Mana, Uttarakhand

The correct answer is Mana, Uttarakhand.

Key Points

• In February 2025, an avalanche struck a Border Roads Organisation (BRO) camp in Mana, Uttarakhand, causing the tragic loss of eight lives.

• Mana is the last Indian village near the Indo-China border in Uttarakhand, situated in the Chamoli district.

• The Border Roads Organisation (BRO) is responsible for developing and maintaining road networks in border areas, which often involves operating in challenging terrains like Mana.

• The avalanche occurred due to heavy snowfall and unstable weather conditions in the Himalayan region, which are common during the winter months.

• Natural disasters like avalanches are frequent in Himalayan regions, necessitating advanced disaster management and preparedness by organizations like BRO.

Additional Information

• Avalanche:

• An avalanche is a sudden flow of snow down a slope, triggered by factors like weather changes, vibrations, or human activity.

• The Himalayan region is highly prone to avalanches due to its steep slopes, heavy snowfall, and changing climatic conditions.

• Border Roads Organisation (BRO):

• The BRO was established in 1960 to construct and maintain road infrastructure in India's border areas.

• It plays a crucial role in supporting India's armed forces and ensuring connectivity in remote regions.

• Mana Village:

• Mana is located at an altitude of approximately 3,200 meters above sea level, making it prone to extreme weather conditions.

• The village is a popular tourist destination and serves as a gateway to the famous Badrinath Temple.

• Disaster Preparedness:

• India has implemented initiatives like the National Disaster Management Authority (NDMA) to improve disaster response and mitigation.

• Advanced technologies, such as avalanche forecasting systems, are being adopted to enhance preparedness in high-risk areas.

Q91. Answer: (a) 212

Shortcut Trick

When a sphere is melted into a cone with the same radius (r), their volumes are equated.

$4/3 \times \pi \times r^3 = 1/3 \times \pi \times r^2 \times h$

$4 \times r = h$

$h = 4 \times 53 = 212$ cm

Therefore The correct answer is 212 cm.

Alternate Method

Given:

Radius of Sphere (r) = 53 cm

Radius of Base of Cone (r) = 53 cm

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Formula Used:

Volume of Sphere = $4/3 \times \pi \times r^3$

Volume of Cone = $1/3 \times \pi \times r^2 \times h$

Calculations:

=> Volume of Sphere = Volume of Cone

=> $4/3 \times \pi \times (53)^3 = 1/3 \times \pi \times (53)^2 \times h$

=> $4 \times 53 = h$

=> h = 212 cm

Therefore The correct answer is 212 cm.

Additional Information

Total Surface Area of Sphere

The total surface area of a sphere is given by the formula $4\pi r^2$.

Slant Height of a Cone

The slant height (l) of a cone is calculated using the Pythagorean theorem: $l = \sqrt{(r^2 + h^2)}$.

Melting and Recasting Rule

In all 3D mensuration problems involving melting and recasting, the volume of the original shape always remains equal to the total volume of the new shapes formed.

Q92. Answer: (d) Ettuttokai

The correct answer is Ettuttokai.

Key Points

• Ettuttokai (The Eight Anthologies) is a significant part of Sangam literature, representing ancient Tamil poetry.

• It contains eight collections of Tamil poems, showcasing the life, culture, and traditions of the Sangam period (circa 300 BCE to 300 CE).

• The eight anthologies include works such as Ainkurunuru, Kurunthogai, Narrinai, and Paripadal, among others.

• These poems predominantly focus on two themes—akam (love and relationships) and puram (war, valor, and ethics).

• The Ettuttokai, along with the Pattuppattu (The Ten Idylls), forms the core of Tamil Sangam literature.

Additional Information

• Sangam Literature:

• Sangam literature refers to the body of Tamil literature created during the Sangam age (circa 300 BCE to 300 CE).

• It is named after the Tamil Sangams (assemblies of poets and scholars) that were believed to have existed in ancient Tamilakam.

• These works are considered the earliest examples of Tamil literature and provide valuable insights into the political, social, and cultural life of that period.

• Akam and Puram:

• Akam refers to the inner world of emotions, focusing on love, relationships, and personal experiences.

• Puram deals with the external world, including themes such as war, heroism, and societal duties.

• Pattuppattu (The Ten Idylls):

• It is another major collection of Sangam poetry, consisting of ten long poems.

• These poems complement the Ettuttokai in representing the literary richness of ancient Tamil culture.

• Historical Importance:

• The Sangam texts provide detailed accounts of the political, economic, and social structures of ancient Tamilakam.

• They are regarded as an invaluable source for understanding the history and evolution of South Indian civilization.

Q93. Answer: (b) 862

The logic followed here is:

Thus, the missing term in the series is 862.

Hence, the correct answer is "Option 2";

Q94. Answer: (a) @ 7 4 * 2

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

Given- S E M T U

Rule No. (1): This condition does not apply because the 1st letter (S) is a consonant, not a vowel.

Rule No. (2): This condition does not apply because the 1st letter (S) is a consonant, not a vowel.

Rule No. (3): This condition applies because the 2nd letter (E) is a vowel and the last letter (U) is also a vowel. So, their codes will be interchanged.

Based on the applicable rule (3), the 2nd and last elements' codes are interchanged.

The code for S is @.

The original code for E is 2.

The original code for U is 7.

So, E will be coded as 7 (the original code for U).

And U will be coded as 2 (the original code for E).

The code for M is 4.

The code for T is *.

Thus, 'S E M T U' is coded as → @ 7 4 * 2.

Hence, the correct answer is "Option 1".

Q95. Answer: (b) KSU 23

The pattern followed here is.

Thus, the missing term in the series is KSU 23.

Hence, the correct answer is Option 2.

Q96. Answer: (a) 40,000

Shortcut Trick

Savings % = 100% − Expenditure % = 100% − 55% = 45%

45% of Income = Rs. 18,000

1% of Income = 18,000 ÷ 45 = Rs. 400

100% (Total Income) = 400 × 100 = Rs. 40,000

Therefore The correct answer is Rs. 40,000.

Alternate Method

Given:

Expenditure = 55% of Income

Savings = Rs. 18,000

Formula Used:

Income = Expenditure + Savings

Let Total Income be 'I'.

=> Savings = I − (55% of I)

=> 18,000 = 45% of I

=> 18,000 = (45 ÷ 100) × I

=> I = (18,000 × 100) ÷ 45

=> I = 400 × 100

=> I = 40,000

Therefore The correct answer is Rs. 40,000.

Additional Information

Percentage Base Change

Income is always considered the 100% base. Any change in expenditure or savings is calculated relative to this 100%.

Savings Ratio

The ratio of Expenditure to Savings here is 55:45, which simplifies to 11:9. Using the unitary method, 9 units = Rs. 18,000, so 20 units (Total Income) = Rs. 40,000.

Successive Percentage

If income increases by x% and expenditure also changes, use the net effect formula: New Income = Original Income × (1 + x/100).

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Q97. Answer: (b) It reduces file size and prevents unwanted editing.

The correct answer is It reduces file size and prevents unwanted editing..

Key Points

• Saving an MS PowerPoint presentation as a .pdf file ensures that the content becomes non-editable, thereby preventing unauthorized modifications.

• PDF files are generally more compact than PowerPoint files, which helps in reducing file size and making them easier to share.

• PDF format ensures consistent display of content, maintaining the original layout, fonts, and graphics regardless of the device or software used to view it.

• The PDF format is widely supported across various platforms and operating systems, providing universal compatibility.

• Saving as PDF removes PowerPoint-specific features such as animations and transitions, focusing solely on the core content for easy readability.

Additional Information

• PDF (Portable Document Format):

• Developed by Adobe, PDFs are designed to present documents in a manner independent of application software, hardware, or operating systems.

• PDFs support text, images, hyperlinks, and even forms, making them versatile for a variety of uses.

• File Compression in PDFs:

• PDF software often includes algorithms to compress images and remove redundant data, helping reduce overall file size.

• Security Features of PDFs:

• PDFs can be encrypted and password-protected to prevent unauthorized access.

• They also support permissions, allowing authors to restrict actions like printing or copying content.

• Difference Between PPT and PDF:

• PPT files are editable and support animations, transitions, and interactive elements, while PDFs are static and primarily focused on readability and sharing.

• Universal Compatibility:

• PDF viewers are available across all major operating systems, including Windows, macOS, Linux, and mobile platforms.

Q98. Answer: (c) 17

Given:

1 is added to each even digit and 1 is added to each odd digit in the number 7142568.

Given	7	1	4	2	5	6	8
Operation	+1	+1	+1	+1	+1	+1	+1
New number	8	2	5	3	6	7	9

The new number formed is 8253679.

The first digit from the left is 8.

The first digit from the right (last digit) is 9.

The sum of these two digits is 8 + 9 = 17.

Hence, the correct answer is "Option 3".

Q99. Answer: (d) JO – QM

The logic followed here is:

Option (1) 'LQ – SP':

Option (2) 'EJ – LI':

Option (3) 'UZ – BY':

Option (4) 'JO – QM':

Hence, the correct answer is "Option 4".

Q100. Answer: (d) Territorial waters and EEZ

The correct answer is Territorial waters and EEZ.

Key Points

• The 40th Amendment Act, 1976, brought Territorial waters, Continental Shelf, Exclusive Economic Zone (EEZ), and other maritime zones under the legislative jurisdiction of the Parliament.

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• This amendment added Entry 25 to the Union List in the Seventh Schedule of the Constitution of India, empowering Parliament to legislate on these areas.

• The aim was to align India's constitutional framework with international maritime laws, specifically the United Nations Convention on the Law of the Sea (UNCLOS).

• The amendment reinforced India's sovereign rights over resources in these maritime zones, including fisheries, oil, and natural gas exploration.

• This was a crucial step in establishing a clear legal framework for India's maritime boundaries and jurisdiction over its waters.

Additional Information

• Territorial Waters:

• Territorial waters extend up to 12 nautical miles from the baseline of a coastal state.

• The state has sovereignty over these waters, including the airspace above and the seabed below.

• Exclusive Economic Zone (EEZ):

• The EEZ extends up to 200 nautical miles from the baseline.

• In this zone, the coastal state has special rights regarding the exploration and use of marine resources, including energy production from water and wind.

• Continental Shelf:

• The continental shelf is the seabed and subsoil that extends beyond the territorial waters, up to 200 nautical miles or more, depending on geological criteria.

• The coastal state has sovereign rights for exploring and exploiting natural resources in this area.

• United Nations Convention on the Law of the Sea (UNCLOS):

• UNCLOS, also known as the Law of the Sea Treaty, was adopted in 1982.

• It defines maritime zones such as territorial waters, EEZ, and continental shelf and establishes the rights and responsibilities of nations regarding the use of oceans.

• India's Maritime Claims:

• India has a coastline of approximately 11,084 km and an EEZ of 2.37 million square kilometers.

• The legislative jurisdiction over maritime zones enables India to safeguard its strategic, economic, and environmental interests.

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