RRB NTPC Graduate Level CBT-I Official Paper (Held On: 13 Jun, 2025 Shift 2) (Previous Year Paper)

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

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Q1. In March 2025, which anniversary of National Defence Day was observed to honour the sacrifices of India’s armed forces?

(a) 65^(th) Anniversary
(b) 60^(th) Anniversary
(c) 87^(th) Anniversary
(d) 76^(th) Anniversary

Q2. In February 2025, five cheetahs were released into which national park of India?

(a) Kanha National Park
(b) Kuno National Park
(c) Periyar Wildlife Sanctuary
(d) Gir National Park

Q3. What should come in place of the question mark (?) in the given series?

942 940 936 930 922 ?

(a) 910
(b) 912
(c) 906
(d) 908

Q4. The selling price of 10 books is equal to the cost price of 16 books. Find the loss or gain percentage.

(a) 50/3% loss % loss
(b) 60% loss
(c) 50/3% loss % gain
(d) 60% gain

Q5. If ‘P’ stands for ‘÷’, ‘Q’ stands for ‘×’, ‘R’ stands for ‘+’ and ‘S’ stands for ‘−’, then the resultant of which of the following would be 50?

(a) 24 P 4 S 28 R 12 Q 6
(b) 24 S 4 Q 28 P 12 R 6
(c) 24 Q 4 R 28 S 12 P 6
(d) 24 R 4 P 28 Q 12 S 6

Q6. A rectangular tin sheet is 17 cm long and 22 cm wide. It is rolled along its width to form a cylinder, with opposite edges just touching each other. Find the volume (in cm^3) of the cylinder.

(a) 2057/π
(b) 2054/π
(c) 2050/π
(d) 2053/π

Q7. In a certain code language, 'LIKE' is coded as '6284' and 'HAIR' is coded as '9578'. What is the code for 'I' in the given code language?

(a) 9
(b) 2
(c) 8
(d) 7

Q8. On 24 January 2025, which day was celebrated to promote girls' rights and welfare in India?

(a) National Girl Child Day
(b) National Girl Safety Day
(c) National Girl Equality Day
(d) National Girl Empowerment Day

Q9. Under which List of the Indian Constitution are co-operative societies classified?

(a) Residuary Powers
(b) Concurrent List
(c) State List
(d) Union List

Q10. Agro-forestry was conceived on the recommendation of which policy to promote plantation on farmlands?

(a) National Agro-forestry Policy, 2019
(b) Protection of Plant Varieties & Farmers' Rights Act, 2001
(c) National Agro-forestry Policy, 2014
(d) National Forest Policy of 2018

Q11. How many launches of the LVM-3 rocket are planned for the Chandrayaan-4 mission?

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

Q12. Raghav starts from Point A and drives 8 km towards South. He then takes a left turn, drives 6 km, turns left and drives 11 km. He then takes a left turn and drives 12 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° turns only, unless specified)

(a) 4 km to the east
(b) 3 km to the east
(c) 5 km to the east
(d) 6 km to the east

Q13. Simplify:

$(7^2 \times 7^3)/(\sqrt{49} \times \sqrt{2401})$

(a) 49
(b) 59
(c) 46
(d) 58

Q14. In the context of computer memory hierarchy, which of the following statements regarding access speed and cost per bit is generally true as you move from registers towards secondary storage?

(a) Access speed increases and cost per bit decreases
(b) Access speed increases and cost per bit increases
(c) Access speed decreases and cost per bit decreases
(d) Access speed decreases and cost per bit increases.

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Q15. Which of the following is NOT mentioned in Part IV of the Indian Constitution?

(a) Promotion of international peace and security
(b) Promotion of Hindi language as a medium of expression
(c) Provision for free and compulsory education for children
(d) Organisation of agricultural and animal husbandry

Q16. A tap fills a cistern in 18 hours. Another tap empties the full tank in 24 hours. How long (in hours) will it take to fill three-fourth of the tank, if the tank is empty initially and both the taps are open together?

(a) 216
(b) 162
(c) 108
(d) 54

Q17. What should come in place of the question mark (?) in the given series?

189 166 155 132 121 98 ?

(a) 66
(b) 75
(c) 92
(d) 87

Q18. In January 2025, National Youth Day was celebrated to mark the birth anniversary of which Indian leader?

(a) Rabindranath Tagore
(b) Raja Rammohan Roy
(c) Subhas Chandra Bose
(d) Swami Vivekananda

Q19. Which of the following devices can function as both input and output devices?

(a) Scanner
(b) Projector
(c) Microphone
(d) Touch Screen

Q20. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

IF-KH-OQ

KH-MJ-QS

(a) MJ-OL-SU
(b) NJ-OL-SV
(c) NJ-OK-SV
(d) MJ-OL-SV

Q21. Which of the following changes was introduced in 2024 under the Companies Act amendments to enhance corporate social responsibility (CSR) transparency in India?

(a) Exemption of companies with a turnover below Rs. 500 crore from CSR obligations
(b) Reduction in the minimum CSR spending threshold for all eligible companies
(c) Requirement for at least 50% of board members to be CSR specialists
(d) Mandatory quarterly CSR reporting accompanied by independent audits

Q22. In which state is the shifting agriculture known as ‘Jhum’?

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

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Q23. If both roots of the quadratic equation, $x^2 + 3x + 2 = 0$, are also roots of another quadratic equation, $ax^2 + bx + c = 0$, then which of the following must be true?

(a) a + 3b + 2c = 0
(b) ax2 + bx + c must be a multiple of $x^2 + 3x + 2$
(c) a = b = c
(d) a/1 = b/2 = c/3

Q24. Find the mean proportional between $(13 + 8\sqrt{5})$ and $(10 - 2\sqrt{5})$.

(a) 10 √2
(b) 5 √2
(c) √(50 + 54√5) \
(d) √(54 + 50√5)

Q25. What is the third proportional of $6x^2$and 18xy?

(a) $54y^2$
(b) 51y2
(c) 53y2
(d) 52y2

Q26. What provision was sanctioned by the Charter Act of 1813?

(a) Railways in India
(b) Introduction of western sciences
(c) Doctrine of Lapse
(d) Ban on child labour

Q27. 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) Brother's Wife's Brother
(b) Wife's Brother
(c) Brother's Wife's Father
(d) Wife's Father

Q28. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) * 4 * 2 9 @ @ 8 3 £ $ 6 4 £ * 4 8 £ % 9 8 8 (Right)

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

(a) 6
(b) 4
(c) 5
(d) 3

Q29. Which of the following ratios is greatest?

(a) 27 : 57
(b) 27 : 54
(c) 30 : 49
(d) 18 : 57

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Q30. Where was the 2024 International Conference of NGOs organised by UNESCO held?

(a) New York City, USA
(b) Paris, France
(c) Geneva, Switzerland
(d) Vienna, Austria

Q31. Each of C, D, E, F, S, T and U has an exam on a different day of a week starting from Monday and ending on Sunday of the same week. F has the exam on Thursday. C has the exam on one of the days after S and on one of the days before E. U has the exam on one of the days after T but on one of the days before D. T has the exam on one of the days after F. How many people have their exams between U and C?

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

Q32. Who has the authority to make laws for multi-state co-operative societies?

(a) District Collector
(b) Parliament
(c) High Court
(d) State Legislature

Q33. Seven people, I, J, K, L, O, P and Q are sitting in a row, facing north. Only three people sit between I and J. L sits to the immediate left of J. No one sits to the right of Q. Only two people sit between Q and L. K sits to the immediate right of P. How many people sit between O and K?

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

Q34. What is India's Human Development Index (HDI) value in the 2025 Human Development Index Report?

(a) 0.575
(b) 0.690
(c) 0.675
(d) 0.685

Q35. Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pair on the left side of :: is the same as that on the right side of ::?

: OLM :: HEF : %

(a) # = POP, % = EUC
(b) # = RVP, % = EQZ
(c) = RUI, % = ESA
(d) # = ROP, % = EBC

Q36. A, B, C, D, G, H and I are sitting around a circular table facing the centre of the table. Only one person sits between D and G when counted from the left of G. H sits third to the right of I. C sits third to the left of A. H sits to the immediate right of C. B is not an immediate neighbour of C. How many people sit between B and G when counted from the right of B?

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

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Q37. The volume (in m^3) of a cube, each of whose edges is 42 m, is:

(a) 74,236
(b) 74,283
(c) 74,009
(d) 74,088

Q38. During the colonial period, India's industrial development was the result of British policies. Which of the following options best describes the nature of industrial development in India at the eve of independence?

(a) Balanced regional distribution of heavy industries
(b) Strong domestic capital goods industry in all provinces
(c) Widespread industrial growth across rural and urban areas
(d) Limited industrial activity, mainly concentrated in a few cities like Calcutta and Bombay

Q39. In applications with multiple tabs (like browsers or MS Word), what does Ctrl + Tab do?

(a) Refreshes the tab
(b) Opens a new tab
(c) Closes the current tab
(d) Switches to the next tab

Q40. Which of the following authorities was strengthened in 2024 to enforce penalties and green clearances under India's environmental regulations?

(a) Central Pollution Control Board
(b) National Biodiversity Authority
(c) National Environment Management Authority
(d) Forest Advisory Council

Q41. Three numbers are in the ratio 2 : 1 : 5, and their LCM is 5380. Their HCF is:

(a) 539
(b) 537
(c) 538
(d) 541

Q42. A cistern has a hole in the bottom through which the water is leaking. A tap can fill the cistern in 8 hours and the hole in the bottom can empty the fully filled cistern in 10 hours. If both the tap and the hole are open, then what will be the time taken to completely fill the empty cistern?

(a) 34 hours
(b) 48.5 hours
(c) 40 hours
(d) 21.5 hours

Q43. Which of the following statements regarding the Industrial Sector in India is/are correct?

1. According to National Manufacturing Policy 2011, every job created in the manufacturing sector creates two-three additional jobs in related activities.

2. Industries add value to the existing goods and also to the skill of labour employed in it; therefore, this sector is also considered a transformational sector.

3. As industries employ a large part of the population, industrial development is one of the preconditions for the eradication of unemployment and poverty from our country.

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

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Q44. Which of the following options best describes the principle of 'collective executive responsibility' as applicable to the Council of Ministers in India?

(a) All ministers share full responsibility for government decisions.
(b) Ministers can opt out of collective responsibility if they disagree publicly.
(c) Only the Prime Minister is responsible for decision-making.
(d) Each minister is independent and is solely accountable for his/her actions.

Q45. If the mode of a data set exceeds its mean by 37.8, then the mode exceeds the median by _____. (Use empirical formula.)

(a) 31.6
(b) 25.2
(c) 29.3
(d) 24.8

Q46. The Rashtrakutas dominated which part of India after the Guptas?

(a) Central India
(b) Deccan
(c) Bengal
(d) Odisha

Q47. Evaluate: 30 - [30 - {30 - (30 - 30 × 3)}]

(a) 109
(b) 105
(c) 107
(d) 90

Q48. A man spends 30% of his monthly salary on house rent. If every month, he also spends Rs. 751 on conveyance and Rs. 8,481 on grocery and saves the remaining Rs. 715, his monthly salary is:

(a) Rs. 14,301
(b) Rs. 14,261
(c) Rs. 14,206
(d) Rs. 14,210

Q49. In a certain code language, ‘OWNS’ is coded as ‘5391’ and ‘SIDE’ is coded as ‘2458’. What is the code for ‘S’ in the given code language?

(a) 5
(b) 2
(c) 1
(d) 4

Q50. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

BI16, EL24, HO32, KR40, ?

(a) NU47
(b) NV48
(c) NV47
(d) NU48

Q51. Which of the following modern physicist closely examined Newtonian mechanics’ foundations?

(a) Ernst Mach
(b) Galileo Galilei
(c) James Clerk Maxwell
(d) Albert Einstein

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Q52. Consider a computer system with a multi-core processor. What is the primary advantage of having multiple cores compared to a single-core processor with the same clock speed when executing multiple independent tasks simultaneously?

(a) Increased capacity for the system's main memory (RAM)
(b) Reduced power consumption for the overall system
(c) Improved ability to handle and execute multiple separate processes concurrently
(d) Enhanced speed for executing a single, heavily threaded application

Q53. Which material was used to make the famous 'Dancing Girl' statue that belonged to the Indus Valley Civilization?

(a) Copper
(b) Iron
(c) Silver
(d) Bronze

Q54. Under the reign of Islamic rulers, which among the following used to be a private building?

(a) Sarai
(b) Bridges
(c) Katra
(d) Diwan-i-khas

Q55. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) * 6 8 @ 1 £ 9 5 3 @ $ 9 © @ 7 9 £ @ 9 1 £ 6 (Right)

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

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

Q56. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All boys are handsome.

Some handsome are cars.

Some cars are grey.

Conclusions:

(I) All handsome are boys.

(II) All cars are handsome.

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

Q57. In February 2025, the Ministry of Corporate Affairs extended the deadline for private companies to dematerialise their securities. What is the new deadline?

(a) 30 June 2025
(b) 31 March 2025
(c) 31 December 2025
(d) 30 September 2025

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Q58. What significant financial commitment was agreed upon during the extended session of COP16 in Rome?

(a) $150 billion annually for renewable energy
(b) $100 billion annually for climate adaptation
(c) $200 billion annually for biodiversity conservation
(d) $250 billion annually for sustainable agriculture

Q59. Mr. K starts from Point Z and drives 6 km towards the north. He then takes a right turn, drives 3 km, turns right and drives 11 km. He then takes a right turn and drives 10 km. He then takes a final right turn, drives 5 km and stops at Point B. How far (shortest distance) and towards which direction should he drive in order to reach Point Z again? (All turns are 90 degree turns only unless specified.)

(a) 7 km towards the east
(b) 4 km towards the south
(c) 4 km towards the west
(d) 11 km towards the north

Q60. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged? 186 ÷ 5 + 189 × 3 − 2 = ?

(a) 887
(b) 881
(c) 884
(d) 869

Q61. NW -19 is related to PZ -10 in a certain way. In the same way, RD -12 is related to TG -3. To which of the given options is WU -2 related, following the same logic?

(a) YX -7
(b) ZZ -5
(c) ZA -5
(d) XA -7

Q62. In the balanced reaction $2Al + 3Cl_2 \rightarrow 2AlCl_3$, what is the mole ratio of aluminium to aluminium chloride?

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

Q63. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

(41, 34, 24)

(63, 80, 23)

(a) (17, 2, 19)
(b) (46, 86, 24)
(c) (43, 40, 23)
(d) (17, 14, 11)

Q64. The Nizam of Hyderabad tried to project his rule as:

(a) a Muslim sovereignty in Deccan
(b) a British protectorate
(c) a Hindu monarchy
(d) a secular republic

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Q65. When the difference between compound interest, compounded annually, and simple interest for three years is Rs. 186 at 10% interest per annum, the principal is Rs. _____.

(a) 6,420
(b) 7,200
(c) 6,000
(d) 5,425

Q66. The marked price of a wardrobe is Rs. 668, which is 22% above the cost price. If the profit percentage is 7%, find the discount percentage (rounded off to two decimal places).

(a) 9.52%
(b) 11.79%
(c) 12.30%
(d) 9.87%

Q67. A man covers distances of 819 km, 1476 km, and 1053 km at the speeds of 63 km/hr, x km/hr, and 81 km/hr, respectively. If his average speed for the whole journey is 54 km/hr, then what is the value of x?

(a) 43
(b) 46
(c) 38
(d) 41

Q68. The average of 36 numbers is 45. If two numbers 37 and 53 are discarded, find the average of the remaining numbers.

(a) 43
(b) 40
(c) 42
(d) 45

Q69. Which of the following is NOT correctly matched?

(a) Ramosi Rebellion - Maharashtra
(b) Lushai Revolt - Assam
(c) Heraka Movement - West Bengal
(d) Kol Rebellion - Jharkhand

Q70. 2 bags and 11 pens together cost Rs. 505, whereas 10 bags and 10 pens together cost Rs. 1310. The cost of 8 bags exceeds the cost of 8 pens by:

(a) Rs. 619
(b) Rs. 616
(c) Rs. 618
(d) Rs. 617

Q71. Kiran borrowed a sum of Rs. 16,000 at a certain rate of simple interest for 2 years. If he paid an interest of Rs. 4,000 at the end of the period at x% per annum rate of interest, the value of x is:

(a) 11.5
(b) 12.5
(c) 14.5
(d) 13.5

Q72. Which of the following urban areas is identified as Million Plus Urban Agglomerations Cities as per Census of India 2001?

(a) Lucknow
(b) Dehradun
(c) Kannauj
(d) Chandigarh

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Q73. Which plateau lies between the Aravali and the Vindhya Range?

(a) Deccan
(b) Meghalaya
(c) Malwa
(d) Chota Nagpur

Q74. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) * 1 * $ 2 3 7 £ 1 7 @ 4 9 9 * 6 * 3 $ 1 $ @ (Right)

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

(a) 4
(b) 6
(c) 5
(d) 3

Q75. A shopkeeper expects a gain of 34% on his cost price. If, in a week, his sales proceeds were Rs. 3,417, what was his profit (in Rs.)?

(a) 867
(b) 864
(c) 865
(d) 870

Q76. Seven boxes, A, B, C, D, E, F and G, are kept one over the other but not necessarily in the same order. Only two boxes are kept between G and B. Only A is kept above F. No box is kept below B. E is kept in some place below C, but in some place above D. How many boxes are kept above E?

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

Q77. IL 17 is related to LN 12 in a certain way. In the same way, MN 12 is related to PP 7. To which of the given options is VR 4 related, following the same logic?

(a) VX −3
(b) YT −1
(c) NF −7
(d) BX −9

Q78. According to the 2011 Census, which island in Lakshadweep has the smallest population?

(a) Kavaratti
(b) Bitra
(c) Kalpeni
(d) Agatti

Q79. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 3518642, then what will the sum of the digits that are second from the left and second from the right in the new number thus formed be?

(a) 9
(b) 7
(c) 8
(d) 6

Q80. 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) NT – QL

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(b) GM – JE
(c) RX – VP
(d) AG – DY

Q81. If sin5A = cos(A – 42°), where 5A is an acute angle, find the value of A.
(a) 23°
(b) 20°
(c) 22°
(d) 21°

Q82. Each of the digits in the number 8514932 is arranged in the descending order from left to right. The position(s) of how many digits will remain unchanged in the new number thus formed as compared to that in the original number?
(a) 4
(b) 2
(c) 3
(d) 1

Q83. A boat travels 14 km upstream in 14 hours and 171 km downstream in 9 hours. What is the speed of the boat in still water?
(a) 10 km/hr
(b) 17 km/hf
(c) 18 km/hf
(d) 6 km/hr

Q84. The base and the corresponding height of a parallelogram are 97 cm and 43 cm, respectively. The area of the parallelogram (in cm^2) will be:
(a) 4171
(b) 4184
(c) 4165
(d) 4191

Q85. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the letter-cluster pair that DOES NOT belong to that group?
(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)
(a) PI - KJ
(b) KO - LP
(c) NR - OS
(d) QU - RV

Q86. If the sum of three numbers a, b and c is 5, the sum of the product of two numbers at a time is −2 and the product of the numbers a, b and c is 3. Find the value of $a^3 + b^3 + c^3$.
(a) 148
(b) 126
(c) 164
(d) 159

Q87. Which of the following is an example of an input device that allows users to interact with a computer by typing text?
(a) Keyboard
(b) Speaker
(c) Monitor
(d) Printer

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Q88. What is another name for the Great Himalayan range?

(a) Central Axial Range
(b) Shiwalik Range
(c) Northeastern Hills
(d) Inner Himalayas

Q89. If the eight-digit number 31425p99 is divisible by 9, then the maximum value of p is :

(a) 8
(b) 3
(c) 4
(d) 5

Q90. According to the NITI Aayog's policy brief 'India's Booming Gig and Platform Economy' (2022), what is the projected size of the gig workforce in India by 2029-30?

(a) 50 million
(b) 23.5 million
(c) 45 million
(d) 35 million

Q91. Which Hindustani music style has originated from the folk songs of the camel-riders of North-West India?

(a) Tappa
(b) Dhrupad
(c) Thumri
(d) Khayal

Q92. A man receives Rs. 5,140 per month as salary. He saves 35% of his salary every month. His expenditure per month is:

(a) Rs. 3,251
(b) Rs. 3,380
(c) Rs. 3,361
(d) Rs. 3,341

Q93. ABC and XYZ are two congruent triangles with angle A : angle B : angle C = 2 : 4 : 4. Find angle X + angle Z

(a) 144°
(b) 72°
(c) 90°
(d) 108°

Q94. What is the primary reason that roughage is included in a balanced human diet?

(a) It aids digestion and prevents constipation.
(b) It builds muscles.
(c) It helps in fat storage.
(d) It increases sugar absorption.

Q95. A, B, C, D, E and W 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. No one lives below D. Only two people live between E and W. Only two people live between C and A. Only one person lives between D and A. E lives on some floor above A. How many people live below B?

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

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Q96. In its advisory capacity, the Union Cabinet's advice to the President of India is considered:

(a) overruled by the Speaker of the Lower House
(b) binding to the President
(c) merely suggestive and non-binding
(d) limited only to economic matters

Q97. Mohan bought 51 books at Rs. 1,120 per book from one shop and 48 books at Rs. 900 per book from another. What is the average price (rounded off to two decimal places, in Rs.) he paid per book?

(a) 1,023.33
(b) 1,028.33
(c) 1,003.33
(d) 1,013.33

Q98. The mode of the observations 4, 1, 5, 2, 8, 6, 7, 4, 3, 5, 1, 6, 4, 9 and 4 is:

(a) 1
(b) 2
(c) 4
(d) 5

Q99. In a certain code language, 'friends good company' is coded as 'li ta ph' and 'friends create nostalgia' is coded as 'ta bu cy'. How is 'friends' coded in the given language?

(a) li
(b) bu
(c) ph
(d) ta

Q100. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

URM 14, TQL 18, SPK 22, ROJ 26, ?

(a) PRN 30
(b) PQM 28
(c) PLI 28
(d) QNI 30

ANSWER KEY

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

SOLUTIONS

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Q1. Answer: (c) 87^(th) Anniversary

The correct answer is 87th Anniversary.

Key Points

• National Defence Day is observed annually in India to honor the sacrifices and contributions of the armed forces in safeguarding the nation's security and sovereignty.

• The year 2025 marked the 87th anniversary of National Defence Day, which traces its roots back to significant military events in 1938.

• This day is dedicated to recognizing the valor, dedication, and commitment of personnel from the Army, Navy, and Air Force.

• National Defence Day also serves as a platform to spread awareness about the importance of a robust defense system in maintaining peace and security.

• Various ceremonies, parades, and tributes are organized across the country to commemorate the occasion.

Additional Information

• Indian Armed Forces

• India's armed forces consist of three main branches: the Army, Navy, and Air Force, along with auxiliary organizations like the Coast Guard.

• The President of India serves as the Supreme Commander of the Indian Armed Forces.

• India has one of the largest and most powerful military forces in the world, with a focus on modernization and self-reliance in defense production.

• Historical Significance

• The establishment of National Defence Day is tied to key milestones in India's military history, including contributions during pre-independence and post-independence periods.

• It is a day to remember the martyrs who laid down their lives in service to the nation.

• Important Military Operations

• India's armed forces have participated in several notable operations, including the Indo-Pak Wars (1947, 1965, 1971, and 1999), the Sino-Indian War (1962), and peacekeeping missions under the United Nations.

• They play a crucial role in disaster relief, internal security, and maintaining strategic stability in the region.

• Key Military Institutions

• India has premier institutions like the National Defence Academy (NDA), Indian Military Academy (IMA), and Defence Research and Development Organisation (DRDO) to train and equip its armed forces.

• These institutions contribute significantly to the development of military strategies, technology, and leadership.

Q2. Answer: (b) Kuno National Park

The correct answer is Kuno National Park.

Key Points

• In February 2025, five cheetahs were released into Kuno National Park, located in Madhya Pradesh, India.

• This release is part of India's ambitious Cheetah Reintroduction Project, aimed at reintroducing cheetahs in the country after their extinction nearly 70 years ago.

• The cheetahs were translocated from Africa as part of a collaborative effort between India and countries like Namibia and South Africa.

• Kuno National Park was selected for this project due to its suitable habitat, abundant prey base, and minimal human-wildlife conflict.

• This effort is a step toward restoring ecological balance and ensuring the conservation of endangered species in India.

Additional Information

• Kuno National Park

• Located in the Sheopur district of Madhya Pradesh, Kuno was declared a national park in 2018.

• The park spans over an area of approximately 748 square kilometers and is known for its diverse flora and fauna.

• Kuno was originally considered a potential site for relocating Asiatic lions from Gir National Park in Gujarat.

• Cheetah Reintroduction in India

• Cheetahs were declared extinct in India in 1952 due to habitat loss, hunting, and human interference.

• The current reintroduction plan is the first time wild cheetahs have been translocated across continents.

• The project involves collaborative efforts with Namibia and South Africa, where the cheetahs were sourced.

• Ecological Importance of Cheetahs

• Cheetahs are apex predators, playing a critical role in maintaining the balance of ecosystems.

• Their presence helps control herbivore populations, promoting the growth of vegetation and biodiversity.

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• Challenges of the Project
• Ensuring the survival and adaptation of cheetahs to their new environment is a significant challenge.
• Potential risks include poaching, human-wildlife conflict, and insufficient prey base in the area.
• Continuous monitoring, habitat management, and public awareness are crucial for the project's success.

Q3. Answer: (b) 912

The logic followed here is:

Thus, the missing term in the series is 912.

Hence, the correct answer is "Option 2";

Q4. Answer: (d) 60% gain

Shortcut Trick

Ratio of Selling Price (SP) to Cost Price (CP) can be derived directly: 10 × SP = 16 × CP.

SP/CP = 16/10 = 8/5.

Here, SP (8 units) > CP (5 units), so there is a gain.

Gain% = (Difference ÷ CP) × 100 = (8 − 5) ÷ 5 × 100 = 3/5 × 100 = 60%.

Therefore The correct answer is 60% gain.

Alternate Method

Given → SP of 10 books = CP of 16 books. Formulas: Profit = SP − CP | Profit% = (Profit ÷ CP) × 100.

=> Let the Cost Price (CP) of 1 book be Re. 1.

=> Then, CP of 16 books = Rs. 16.

=> According to the question, SP of 10 books = CP of 16 books = Rs. 16.

=> CP of 10 books = Rs. 10.

=> Gain = SP − CP = 16 − 10 = Rs. 6.

=> Gain% = (6 ÷ 10) × 100 = 60%.

Therefore The correct answer is 60% gain.

Additional Information

Profit and Loss on Quantity

When the CP of 'x' articles equals the SP of 'y' articles, the profit or loss percentage is given by [(x − y) ÷ y] × 100. If positive, it is a gain; if negative, it is a loss.

Relation between SP and CP

If SP > CP, there is a profit. If CP > SP, there is a loss. Percentage is always calculated on the Cost Price unless specified otherwise.

Q5. Answer: (a) 24 P 4 S 28 R 12 Q 6

BODMAS Rule:

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

Original Letter	P	Q	R	S
New Symbol	÷	×	•	−

We need to find which option results in 50 after interchanging the symbols.

Let's evaluate each option:

1) 24 P 4 S 28 R 12 Q 6

After interchanging the signs: 24 ÷ 4 − 28 + 12 × 6

=> 24 ÷ 4 − 28 + 12 × 6

=> 6 − 28 + 72

=> −22 + 72

=> 50

2) 24 S 4 Q 28 P 12 R 6

After interchanging the signs: 24 − 4 × 28 ÷ 12 + 6

=> 24 − 4 × 28 ÷ 12 + 6

=> 24 − 4 × (7/3) + 6

=> 24 − 28/3 + 6

=> (72 − 28)/3 + 6
=> 44/3 + 6
=> (44 + 18)/3
=> 62/3
3) 24 Q 4 R 28 S 12 P 6
After interchanging the signs: 24 × 4 + 28 − 12 ÷ 6
=> 24 × 4 + 28 − 12 ÷ 6
=> 24 × 4 + 28 − 2
=> 96 + 28 − 2
=> 124 − 2
=> 122
4) 24 R 4 P 28 Q 12 S 6
After interchanging the signs: 24 + 4 ÷ 28 × 12 − 6
=> 24 + 4 ÷ 28 × 12 − 6
=> 24 + 12/7 − 6
=> (168 + 12)/7 − 6
=> 180/7 − 6
=> (180 − 42)/7
=> 138/7
Hence, the correct answer is "Option 1".

Q6. Answer: (a) 2057/π

Shortcut Trick
When a sheet is rolled along its width, the width becomes the circumference (C) and the length becomes the height (h).
C = 22 cm => 2πr = 22 => r = 11/π cm
Volume = $\pi r^2 h = \pi \times (11/\pi)^2 \times 17$
Volume = $\pi \times (121/\pi^2) \times 17 = 2057/\pi$ cm^3
Therefore The correct answer is $2057/\pi$ cm^3.
Alternate Method
Given: Length of rectangular sheet (l) = 17 cm, Width (w) = 22 cm.
Formula Used: Volume of cylinder = $\pi r^2 h$; Circumference = 2πr
=> When rolled along the width, the circumference of the base of the cylinder = 22 cm.
=> 2 × π × r = 22
=> r = 22 / (2π) = 11/π cm
=> The height (h) of the cylinder = 17 cm
=> Volume = $\pi \times (11/\pi)^2 \times 17$
=> Volume = $\pi \times (121/\pi^2) \times 17$
=> Volume = (121 × 17) / π
=> Volume = $2057/\pi$ cm^3
Therefore The correct answer is $2057/\pi$ cm^3.
Additional Information
Cylinder Rolling Rules
If rolled along length 'L', then 2πr = L and h = width. If rolled along width 'W', then 2πr = W and h = length.
Surface Area of Cylinder
Curved Surface Area (CSA) = $2\pi rh$. Total Surface Area (TSA) = $2\pi r(h + r)$.
Volume of Cylinder
Volume = Base Area × Height = $\pi r^2 h$.

Q7. Answer: (c) 8

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

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Q8. Answer: (a) National Girl Child Day

The correct answer is National Girl Child Day.

Key Points

• National Girl Child Day is celebrated in India every year on 24th January to promote awareness about the rights, education, and health of girl children.

• It was first initiated by the Ministry of Women and Child Development in 2008 to highlight the issues faced by girls in India and to empower them.

• The day emphasizes addressing gender-based discrimination and promoting gender equality in all aspects of society.

• Various campaigns and events are organized across the country to spread awareness about the importance of saving, educating, and empowering the girl child.

• The celebration aligns with the goals of government schemes like Beti Bachao Beti Padhao, which focuses on improving the welfare and status of girls in India.

Additional Information

• Beti Bachao Beti Padhao (BBBP):

• Launched in 2015, it aims to address declining Child Sex Ratio (CSR) and promote the survival, protection, and education of the girl child.

• The campaign is a tri-ministerial effort involving the Ministries of Women and Child Development, Health and Family Welfare, and Education.

• Sukanya Samriddhi Yojana (SSY):

• A government-backed savings scheme aimed at securing the future of girl children.

• Parents can open an account for a girl child below 10 years, with benefits like tax exemptions and high-interest rates.

• Gender Inequality in India:

• India has faced challenges like female infanticide, child marriage, and gender-based violence, which these initiatives aim to address.

• Promoting girl child education and empowerment is pivotal to achieving societal progress and economic development.

• United Nations International Day of the Girl Child:

• Celebrated globally on 11th October, it complements India's National Girl Child Day by advocating for girls' rights worldwide.

• The focus is on issues like education, healthcare access, and ending child marriage.

Q9. Answer: (c) State List

The correct answer is State List.

Key Points

• Co-operative societies are classified under the State List of the Indian Constitution as per Entry 32 of List II in the Seventh Schedule.

• This classification empowers state governments to legislate on matters related to co-operative societies within their respective jurisdictions.

• The 97th Constitutional Amendment Act, 2011 added a new Part IXB to the Indian Constitution, exclusively dealing with co-operative societies.

• Part IXB provides for the promotion, management, and governance of co-operative societies, ensuring their autonomy and democratic functioning.

• Although primarily under the State List, certain aspects of co-operative societies may also be addressed under the Concurrent List, especially post the 97th Amendment.

Additional Information

• Seventh Schedule of the Indian Constitution

• The Seventh Schedule divides the powers between the Union and State governments into three lists: Union List, State List, and Concurrent List.

• The Union List contains subjects on which only the Parliament can legislate, such as defense and foreign affairs.

• The State List contains subjects on which state legislatures can legislate, including police, public health, and agriculture.

• The Concurrent List contains subjects on which both Parliament and state legislatures can legislate, like education and forest conservation.

• 97th Constitutional Amendment Act, 2011

• This amendment introduced the concept of co-operative societies into the Constitution.

• It added the term "co-operatives" in Article 19(1)(c), allowing citizens the right to form co-operative societies.

• It mandated states to enact laws ensuring the autonomous and democratic functioning of co-operative societies.

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• Co-operative Societies in India

• Co-operative societies are voluntary associations formed for mutual benefit and operate on democratic principles.

• They play a vital role in sectors like agriculture, banking, housing, and consumer goods.

• Examples include milk co-operatives like Amul and co-operative banks providing financial services to rural communities.

• Concurrent List and Co-operatives

• Post the 97th Amendment, aspects of co-operatives such as their governance and management can be legislated under the Concurrent List.

• This ensures both the states and the central government can collaborate to strengthen co-operative societies.

Q10. Answer: (c) National Agro-forestry Policy, 2014

The correct answer is National Agro-forestry Policy, 2014.

Key Points

• The National Agro-forestry Policy, 2014 was introduced by the Government of India to promote agro-forestry practices across the country.

• This policy aims to integrate trees and agriculture on farmland, enhancing productivity, livelihoods, and environmental sustainability.

• The policy encourages farmers to grow trees alongside crops on their farmland, ensuring a balance between agricultural and forestry practices.

• It emphasizes the relaxation of regulatory constraints related to tree felling, transportation, and marketing of agro-forestry produce.

• The National Agro-forestry Policy, 2014, aligns with India's commitments to increasing forest cover and promoting sustainable agricultural practices.

Additional Information

• Agro-forestry:

• Agro-forestry is a land-use system that integrates trees and shrubs with crops and livestock on the same land.

• It helps in improving soil fertility, water retention, and biodiversity while also providing economic benefits to farmers.

• Common agro-forestry practices include alley cropping, silvopasture, and windbreaks.

• Benefits of Agro-forestry:

• It enhances carbon sequestration, contributing to climate change mitigation.

• Agro-forestry reduces soil erosion and improves soil health, ensuring sustainable farming practices.

• It provides additional income through timber, fruits, and other forest-based products.

• National Forest Policy, 1988:

• The National Forest Policy of 1988 emphasizes maintaining ecological balance and preserving biodiversity.

• The policy aims to increase forest and tree cover to 33% of India's geographical area.

• India's Agro-forestry Mission:

• The National Agro-forestry Policy, 2014, is implemented under the ambit of the Ministry of Agriculture & Farmers' Welfare.

• It aligns with India's National Action Plan on Climate Change and Sustainable Development Goals (SDGs).

Q11. Answer: (c) Two

The correct answer is Two.

Key Points

• The Chandrayaan-4 mission by the Indian Space Research Organisation (ISRO) is planned to have two launches using the LVM-3 rocket.

• The LVM-3 (Launch Vehicle Mark-3) is ISRO's heaviest and most advanced launch vehicle, capable of carrying payloads up to 8,000 kg to Low Earth Orbit (LEO).

• The two launches will ensure the deployment of the required mission components, which may include an orbiter, lander, and rover, depending on the mission design.

• The Chandrayaan-4 mission is expected to build on the advancements made during the Chandrayaan-2 and Chandrayaan-3 missions, focusing on lunar exploration and scientific research.

• ISRO uses the LVM-3 rocket for critical missions due to its high reliability and capability to handle complex payloads.

Additional Information

• LVM-3 Rocket (Launch Vehicle Mark-3):

• The LVM-3, previously known as GSLV Mk-III, is a three-stage heavy-lift launch vehicle developed by ISRO.

• It has a lift-off mass of approximately 640 tons and stands 43.5 meters tall.

• The rocket uses a combination of solid, liquid, and cryogenic propulsion systems.
• LVM-3 is also the launch vehicle for India's human spaceflight program, Gaganyaan.
• Chandrayaan Missions:
• Chandrayaan-1 (2008): India's first lunar mission focused on mapping the Moon's surface and detecting water molecules.
• Chandrayaan-2 (2019): Aimed at soft-landing a rover on the lunar south pole, though the lander lost communication during descent.
• Chandrayaan-3 (2023): Successfully demonstrated soft-landing and deployed a rover for lunar surface exploration.
• Scientific Objectives of Chandrayaan-4:
• To further explore the lunar surface, particularly the unexplored south pole region.
• To conduct advanced experiments on lunar geology, topography, and surface composition.
• To test new technologies for future interplanetary missions.
• ISRO's Lunar Exploration Roadmap:
• ISRO plans to establish a strong presence in lunar exploration as part of its long-term goals.
• Future missions include more advanced lunar landers and potential collaboration with international space agencies.

Q12. Answer: (d) 6 km to the east

Given:

Raghav starts from Point A and drives 8 km towards South.

He then takes a left turn, drives 6 km, turns left and drives 11 km.

He then takes a left turn and drives 12 km. He takes a final left turn, drives 3 km and stops at Point P.

Thus, He should derive 6 km to the east in order to reach Point A again.

Hence, the correct answer is "Option 4".

Q13. Answer: (a) 49

Given:

$(7^2 \times 7^3)/(\sqrt{49} \times \sqrt{2401})$

Formula Used:

Exponent Rules: $a^m \times a^n = a^{(m+n)}$

Square Root Simplification: $\sqrt{a^2} = a$

Calculation:

$(7^2 \times 7^3)/(\sqrt{49} \times \sqrt{2401})$

$=> (7^2 \times 7^3)/(\sqrt{(7^2)} \times \sqrt{(7^4)})$

$=> (7^2 \times 7^3)/(7 \times 7^2)$

$=> 7^2$

=> 49

Therefore Option 1 is the correct answer.

Q14. Answer: (c) Access speed decreases and cost per bit decreases

The correct answer is Access speed decreases and cost per bit decreases.

Key Points

• As we move down the memory hierarchy—from registers to secondary storage—the access speed decreases. Registers are the fastest, while secondary storage devices like hard drives are significantly slower.
• The cost per bit of storage decreases as we move from registers to secondary storage. Registers and cache are expensive due to their high-speed performance and small size.
• Registers are located within the CPU, offering nanosecond-level access times, whereas secondary storage devices like HDDs or SSDs have access times in milliseconds or microseconds.
• Secondary storage devices, such as hard drives, offer much larger storage capacity at a lower cost per bit but are slower in terms of data retrieval compared to primary memory.

Additional Information

• Memory Hierarchy in Computers
• It refers to the arrangement of memory types based on speed, cost, and capacity.
• It typically includes registers, cache, main memory (RAM), and secondary storage (HDD/SSD).
• Registers and cache are the fastest but have the smallest capacity, while secondary storage is slower but offers large capacity.
• Access Time

• Access time is the time taken by the CPU to retrieve data from memory.

• Registers have the shortest access time, measured in nanoseconds, while secondary storage access time is measured in milliseconds or microseconds.

• Cost per Bit

• Cost per bit refers to the expense incurred for storing one bit of data.

• Registers and cache have the highest cost per bit, while secondary storage devices have the lowest cost per bit.

• Secondary Storage

• Includes devices like HDDs, SSDs, and optical disks.

• It is non-volatile and provides persistent storage for data even when the system is powered off.

• Registers

• Smallest and fastest memory located directly within the CPU.

• Used to temporarily store data that is actively being processed by the CPU.

Q15. Answer: (b) Promotion of Hindi language as a medium of expression

The correct answer is Promotion of Hindi language as a medium of expression.

Key Points

• Part IV of the Indian Constitution deals with the Directive Principles of State Policy (DPSP), which provides guidelines for the establishment of a just society.

• The promotion of Hindi language as a medium of expression is not explicitly mentioned in Part IV of the Constitution.

• Article 51 of Part IV mentions the promotion of international peace and security as one of the Directive Principles.

• Other provisions under Part IV include the organisation of agricultural and animal husbandry (Article 48) and the provision for free and compulsory education for children (Article 45).

• The Directive Principles aim to create social and economic conditions under which citizens can lead a good life, ensuring equality and welfare for all.

Additional Information

• Part IV - Directive Principles of State Policy:

• Directive Principles are non-justiciable guidelines for governance provided to the State.

• These principles are inspired by the Irish Constitution and aim to achieve socio-economic justice.

• They are categorized into economic and social, Gandhian, and international principles.

• Article 51 (Promotion of International Peace):

• The State shall promote international peace and security.

• It aims to maintain just and honorable relations between nations and encourage settlement of international disputes by arbitration.

• Article 45 (Education for Children):

• The Constitution mandates free and compulsory education for children until they reach the age of 14 years.

• This was later reinforced by the Right to Education Act, 2009.

• Article 48 (Agriculture and Animal Husbandry):

• The State shall endeavor to organize agriculture and animal husbandry on modern and scientific lines.

• It also aims to preserve and improve breeds and prohibit the slaughter of cows, calves, and other milch and draught cattle.

• Promotion of Hindi Language:

• Provisions related to the promotion of Hindi language are covered under Part XVII (Articles 343-351) of the Constitution.

• It emphasizes the development of Hindi as the official language and its enrichment by assimilating elements from other Indian languages.

Q16. Answer: (d) 54

Shortcut Trick

Net efficiency = Fill rate − Empty rate = 1/18 − 1/24 = (4 − 3)/72 = 1/72 unit/hr.

Time to fill full tank = 72 hours.

Time to fill 3/4^(th) tank = 72 × 3/4 = 18 × 3 = 54 hours.

Therefore The correct answer is 54 hours.

Alternate Method

Given: Filling Tap (A) = 18 hours, Emptying Tap (B) = 24 hours.

Formula Used: Total Work = LCM of time; Efficiency = Work ÷ Time.

Tap	Time (hrs)	Total Work (LCM)	Efficiency
A (Fill)	18	72 units	+4
B (Empty)	24	−3	

=> Combined Efficiency of (A + B) = 4 − 3 = 1 unit/hr

=> Target Work = 3/4 × Total Work = 3/4 × 72 = 54 units

=> Time Required = Target Work ÷ Combined Efficiency = 54 ÷ 1 = 54 hours

Therefore The correct answer is 54 hours.

Additional Information

Net Work Done

When one pipe fills (x) and another empties (y), net work in 1 hour = (1/x − 1/y). If the result is positive, the tank fills; if negative, it empties.

Pipes and Cisterns vs Time and Work

The logic is identical to Time and Work, but the emptying tap (outlet) is treated as having negative efficiency.

Partial Filling

To find time for a fraction (k) of the tank, use: Time = (k × Total Capacity) ÷ Net Efficiency.

Q17. Answer: (d) 87

The logic followed here is:

Thus, the missing term in the series is 87.

Hence, the correct answer is "Option 4";

Q18. Answer: (d) Swami Vivekananda

The correct answer is Swami Vivekananda.

Key Points

• National Youth Day is celebrated annually on 12th January to commemorate the birth anniversary of Swami Vivekananda.

• The Government of India declared Swami Vivekananda's birthday as National Youth Day in 1984 to honor his contributions towards inspiring youth.

• Swami Vivekananda, a key figure in introducing Indian philosophies like Vedanta and Yoga to the Western world, believed in the power of youth for nation-building.

• His teachings focused on self-confidence, self-reliance, and spirituality, making him an ideal role model for Indian youth.

• Various programs, including speeches, seminars, cultural performances, and competitions, are organized across India on National Youth Day to spread awareness about his life and ideals.

Additional Information

• Swami Vivekananda:

• Born on 12th January 1863 in Kolkata, India, he was originally named Narendranath Datta.

• He was a disciple of Ramakrishna Paramahamsa and went on to establish the Ramakrishna Mission in 1897.

• Swami Vivekananda is best known for his speech at the 1893 Parliament of the World's Religions in Chicago, where he introduced Hinduism to the global audience.

• His famous quote, "Arise, awake, and stop not till the goal is reached," continues to inspire millions worldwide.

• National Youth Day Themes:

• Every year, National Youth Day is celebrated with a particular theme to engage the youth in constructive activities.

• The themes are centered around topics like youth empowerment, innovation, and spirituality.

• Significance of National Youth Day:

• The day serves to highlight the role of youth in shaping the future of the nation.

• It encourages young people to imbibe the teachings of Swami Vivekananda and work towards self-development and societal progress.

• Global Recognition:

• Swami Vivekananda's ideas on religious harmony, universal brotherhood, and the empowerment of youth resonate globally.

• His contributions to philosophy and spirituality have earned him recognition as one of India's greatest cultural ambassadors.

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Q19. Answer: (d) Touch Screen

The correct answer is Touch Screen.

Key Points

• A touch screen is an electronic display that can act as both an input and output device.

• As an input device, it allows users to interact with the system by touching the screen using a finger or stylus.

• As an output device, it displays visual content, such as text, images, or videos, similar to a regular screen or monitor.

• Touch screens are commonly used in smartphones, tablets, ATMs, interactive kiosks, and other digital devices.

• They employ various technologies such as resistive, capacitive, infrared, or surface acoustic wave to detect and process touch inputs.

Additional Information

• Resistive Touch Screen:

• It uses two electrically conductive layers separated by a small gap.

• When pressure is applied to the screen, the layers come into contact, registering the touch input.

• Commonly used in older devices and ATM machines.

• Capacitive Touch Screen:

• It works by sensing the electrical conductivity of the user's finger.

• Capacitive screens are more responsive and support multi-touch gestures.

• They are widely used in smartphones and modern tablets.

• Infrared Touch Screen:

• This technology uses infrared light beams to detect touch.

• It does not require physical contact; even proximity can register input.

• Typically found in interactive kiosks and large touch displays.

• Surface Acoustic Wave (SAW) Touch Screen:

• SAW screens rely on ultrasonic waves that pass over the touch screen surface.

• When the screen is touched, the waves are absorbed, allowing the location of the touch to be determined.

• They provide high clarity and durability but are sensitive to external contaminants.

• Applications of Touch Screens:

• Touch screens are widely used in retail stores, healthcare, education, gaming, and industrial automation.

• They enable intuitive user experiences, reducing the need for external peripherals like keyboards or mice.

Q20. Answer: (a) MJ-OL-SU

The logic followed here is:

1. First to Second Cluster: Both letters in the first cluster shift +2 positions forward in the English alphabetical order.

2. Second to Third Cluster: The first letter shifts +4 positions forward, and the second letter shifts +9 positions forward in the English alphabetical order.

IF : KH : OQ

KH : MJ : QS

Now, let's apply this combined logic to the given options to find the triad that follows the same pattern:

Option 1: MJ-OL-SU

This option follows the pattern.

Option 2: NJ-OL-SV

This option does NOT follow the pattern.

Option 3: NJ-OK-SV

This option does NOT follow the pattern.

Option 4: MJ-OL-SV

This option does NOT follow the pattern.

Hence, the correct answer is "Option 1".

Q21. Answer: (d) Mandatory quarterly CSR reporting accompanied by independent audits

The correct answer is Mandatory quarterly CSR reporting accompanied by independent audits.

Key Points

• In 2024, the Indian government amended the Companies Act to improve Corporate Social Responsibility (CSR) transparency.

• The amendment introduced mandatory quarterly CSR reporting for eligible companies to ensure regular updates on CSR

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activities.

• Independent audits of the CSR reports were made compulsory to enhance credibility and accountability.

• The change aims to address issues of non-compliance, misuse of CSR funds, and ensure alignment of CSR activities with their intended social objectives.

• This step is part of broader efforts to encourage responsible corporate governance and increase trust among stakeholders.

Additional Information

• Corporate Social Responsibility (CSR):

• CSR refers to the practices where businesses voluntarily contribute to sustainable development by delivering economic, social, and environmental benefits.

• In India, Section 135 of the Companies Act, 2013 mandates CSR spending for companies meeting certain financial thresholds.

• Eligible companies must spend at least 2% of their average net profit of the last 3 years on CSR activities.

• Independent Audits:

• Independent audits involve third-party examination of financial or operational processes to ensure compliance and accuracy.

• In the context of CSR, these audits validate the effectiveness and alignment of CSR projects with prescribed norms.

• CSR Reporting:

• CSR reporting involves documenting and disclosing information about a company's CSR activities, expenditures, and outcomes.

• Quarterly reporting ensures transparency and provides regular updates to stakeholders about the company's contribution to social development.

• Impact of CSR Amendments:

• Improves corporate accountability and stakeholder confidence.

• Encourages companies to align their CSR initiatives with national development goals.

• Addresses misuse or underutilization of CSR funds by ensuring stricter compliance.

Q22. Answer: (c) Assam

The correct answer is Assam.

Key Points

• 'Jhum' is the local name for shifting cultivation practiced predominantly in the northeastern states of India, including Assam.

• It involves clearing a patch of forest land, burning the vegetation, and using the ash as fertilizer to grow crops.

• After cultivating the land for a few years, farmers leave it fallow to allow the soil to regain its fertility.

• Jhum cultivation is a traditional practice among tribal communities and is deeply rooted in their culture and livelihood.

• This agricultural method is also practiced in other northeastern states like Nagaland, Meghalaya, and Arunachal Pradesh, but Assam remains one of the prominent regions for Jhum cultivation.

Additional Information

• Shifting Cultivation: It is an agricultural practice where land is cultivated temporarily, then abandoned to allow natural vegetation to regenerate.

• Environmental Concerns: Jhum cultivation has been criticized for causing deforestation, soil erosion, and loss of biodiversity in the northeastern states.

• Sustainable Alternatives: The Indian government and various NGOs promote sustainable agricultural practices like terrace farming as alternatives to Jhum cultivation.

• Historical Significance: Shifting cultivation has been practiced for centuries by indigenous communities, who rely on it for subsistence farming.

• Government Initiatives: Programs like the National Mission for Sustainable Agriculture (NMSA) aim to provide support to farmers transitioning from Jhum cultivation to more sustainable methods.

Q23. Answer: (b) ax2 + bx + c must be a multiple of $x^2 + 3x + 2$

Shortcut Trick

If two quadratic equations have both roots in common, their corresponding coefficients must be proportional.

Equation 1: $1x^2 + 3x + 2 = 0$

Equation 2: $ax^2 + bx + c = 0$

Proportionality: $a/1 = b/3 = c/2 = k$ (where k is a constant)

=> $ax^2 + bx + c = k(x^2 + 3x + 2)$

Therefore The correct answer is $ax^2 + bx + c$ must be a multiple of $x^2 + 3x + 2$.

Alternate Method

Given:

First equation: $x^2 + 3x + 2 = 0$
Second equation: $ax^2 + bx + c = 0$
Formula Used:
A quadratic equation with roots α and β can be expressed as $k(x - \alpha)(x - \beta) = 0$, where k is a non-zero constant.
Calculations:
=> First, we find the roots of $x^2 + 3x + 2 = 0$:
=> $x^2 + 2x + x + 2 = 0$
=> $x(x + 2) + 1(x + 2) = 0$
=> $(x + 1)(x + 2) = 0$
=> The roots are $x = -1$ and $x = -2$.
=> Since $ax^2 + bx + c = 0$ also has these same roots, it must be of the form:
=> $ax^2 + bx + c = k(x - (-1))(x - (-2))$
=> $ax^2 + bx + c = k(x + 1)(x + 2)$
=> $ax^2 + bx + c = k(x^2 + 3x + 2)$
=> This confirms that the polynomial $ax^2 + bx + c$ is a constant multiple of $x^2 + 3x + 2$.
Therefore The correct answer is $ax^2 + bx + c$ must be a multiple of $x^2 + 3x + 2$.
Additional Information
Condition for Two Common Roots
For equations $a1x^2 + b1x + c1 = 0$ and $a2x^2 + b2x + c2 = 0$ to have both roots in common: $a1/a2 = b1/b2 = c1/c2$.
Condition for One Common Root
If only one root is common, the condition is $(c1a2 - c2a1)^2 = (a1b2 - a2b1)(b1c2 - b2c1)$.
Relationship between Roots and Coefficients
For $ax^2 + bx + c = 0$, the sum of roots is $-b/a$ and the product of roots is c/a.

**Q24. Answer: (c) √(50 + 54√5) **

Shortcut Trick
The Mean Proportional (MP) between two numbers a and b is given by $\sqrt{(a \times b)}$.
Given $a = (13 + 8\sqrt{5})$ and $b = (10 - 2\sqrt{5})$.
Product = $13(10 - 2\sqrt{5}) + 8\sqrt{5}(10 - 2\sqrt{5}) = 130 - 26\sqrt{5} + 80\sqrt{5} - 16(5)$.
Product = $130 + 54\sqrt{5} - 80 = 50 + 54\sqrt{5}$.
MP = $\sqrt{(50 + 54\sqrt{5})}$.
Therefore The correct answer is $\sqrt{(50 + 54\sqrt{5})}$.
Alternate Method
Mean Proportional Formula
$x = \sqrt{(a \times b)}$
$a = 13 + 8\sqrt{5}$
$b = 10 - 2\sqrt{5}$
Given:
First term (a) = $(13 + 8\sqrt{5})$
Second term (b) = $(10 - 2\sqrt{5})$
Formula Used:
=> Mean Proportional = $\sqrt{(a \times b)}$
Calculations:
=> Mean Proportional = $\sqrt{[(13 + 8\sqrt{5}) \times (10 - 2\sqrt{5})]}$
=> Let Product (P) = $13(10) - 13(2\sqrt{5}) + 8\sqrt{5}(10) - 8\sqrt{5}(2\sqrt{5})$
=> $P = 130 - 26\sqrt{5} + 80\sqrt{5} - (16 \times 5)$
=> $P = 130 + 54\sqrt{5} - 80$
=> $P = 50 + 54\sqrt{5}$
=> Mean Proportional = $\sqrt{(50 + 54\sqrt{5})}$
Therefore The correct answer is $\sqrt{(50 + 54\sqrt{5})}$.
Additional Information
Mean Proportional

If a, b, and c are in continued proportion such that a:b = b:c, then b is the mean proportional where $b^2 = ac$ or $b = \sqrt{ac}$.

Third Proportional

The third proportional to two numbers a and b is c, such that a:b = b:c, which gives $c = b^2/a$.

Fourth Proportional

The fourth proportional to three numbers a, b, and c is d, such that a:b = c:d, which gives $d = (b \times c)/a$.

Q25. Answer: (a) $54y^2$

Shortcut Trick

For two numbers a and b, the third proportional is given by the formula $b^2 \div a$.

Here, $a = 6x^2$ and $b = 18xy$.

Third Proportional = $(18xy) \times (18xy) \div (6x^2)$

=> $(324x^2y^2) \div (6x^2) = 54y^2$.

Therefore The correct answer is $54y^2$.

Alternate Method

$6x^2$

:

18xy

::

c

Ratio: a : b :: b : c

Given: First term (a) = $6x^2$, Second term (b) = 18xy.

Formula Used: If c is the third proportional to a and b, then a : b = b : c.

=> a/b = b/c

=> $c = b^2 / a$

=> $c = (18xy)^2 / 6x^2$

=> $c = (324x^2y^2) / 6x^2$

=> $c = 54y^2$

Therefore The correct answer is $54y^2$.

Additional Information

Mean Proportional

The mean proportional between two numbers a and b is given by $\sqrt{(a \times b)}$.

Fourth Proportional

For three numbers a, b, and c, the fourth proportional d is calculated using a : b = c : d, which means $d = (b \times c) / a$.

Continued Proportion

Numbers a, b, c are in continued proportion if a/b = b/c, implying $b^2 = ac$.

Q26. Answer: (b) Introduction of western sciences

The correct answer is Introduction of western sciences.

Key Points

• The Charter Act of 1813 allowed for the promotion of Western education in India, including sciences and literature.

• This act sanctioned a sum of Rs. 1 lakh annually for the education of Indians to encourage the introduction of Western knowledge.

• The Act ended the monopoly of the East India Company in trade, except for trade in tea and trade with China, which indirectly supported the spread of education and knowledge.

• It laid the foundation for modern education in India by emphasizing the need for institutions to teach Western sciences and languages.

• Missionaries were allowed under the Act to propagate Christianity, which also contributed to the spread of English education in India.

Additional Information

• Charter Act of 1813

• This Act was passed by the British Parliament to renew the charter of the East India Company.

• It marked a shift in British policy by introducing measures for the advancement of education in India.

• It also aimed to protect the rights of Indian subjects and bring changes in administrative governance.

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• Western Education in India
• The Charter Act of 1813 was the first official step toward the establishment of English education in India.
• Western sciences and literature were introduced as part of a broader effort to modernize Indian education.
• It provided the groundwork for future educational reforms such as the Macaulay Minute of 1835.
• Missionary Activities
• The Act allowed Christian missionaries to enter India and propagate their religion.
• Missionaries were instrumental in establishing schools and colleges that taught Western sciences and languages.
• Impact on Indian Society
• The introduction of Western sciences and literature helped Indians gain knowledge in various fields such as medicine, engineering, and law.
• It also contributed to the rise of a new educated middle class in India.

Q27. Answer: (c) Brother's 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 sister of O.
O × P: O is the wife of P.
P – Q: P is the brother of Q.
According to the given information Family Tree Representation:
Therefore, M is Brother's Wife's Father of Q.
Hence, the correct answer is "Option 3"

Q28. Answer: (b) 4

Given series:
(Left) * 4 * 2 9 @ @ 8 3 £ $ 6 4 £ * 4 8 £ % 9 8 8 (Right)
Condition to be checked:
Symbols which are immediately preceded by a number and also immediately followed by a symbol.
Number → Symbol → Symbol
• 4 * 2 9 @ @ 8 3 £ $ 6 4 £ * 4 8 £ % 9 8 8
Thus, here is the 4 pairs which satisfy the conditions.
Hence,"4" is the correct answer.
Mistake Points
Immediately preceded by means immediately before or to come just before.
Immediately followed by means immediately after or to come just after.

Q29. Answer: (c) 30 : 49

Shortcut Trick
Convert each ratio to its decimal equivalent for a quick comparison.
(1) 27/57 ≈ 0.473 | (2) 27/54 = 0.5 | (3) 30/49 ≈ 0.612 | (4) 18/57 ≈ 0.315
The value 0.612 is the largest among all calculated decimals.
Therefore The correct answer is 30 : 49.
Alternate Method
Given: Ratios are 27/57, 27/54, 30/49, and 18/57.
=> Compare (1) 27/57 and (2) 27/54: Since numerators are same, the one with smaller denominator is greater. Therefore 27/54 > 27/57.
=> Compare (1) 27/57 and (4) 18/57: Since denominators are same, the one with larger numerator is greater. Therefore 27/57 > 18/57.

=> Now compare (2) 27/54 = 1/2 = 0.5 with (3) 30/49.

=> For 30/49, half of 49 is 24.5. Since 30 > 24.5, then 30/49 > 0.5.

=> 30/49 ≈ 0.612.

Therefore The correct answer is 30 : 49.

Additional Information

Comparing Fractions with Same Numerators

If numerators are equal, the fraction with the smaller denominator is the larger value.

Comparing Fractions with Same Denominators

If denominators are equal, the fraction with the larger numerator is the larger value.

Cross-Multiplication Method

To compare a/b and c/d, check the products (a × d) and (b × c). If (a × d) > (b × c), then a/b > c/d.

Q30. Answer: (b) Paris, France

The correct answer is Paris, France.

Key Points

• The 2024 International Conference of NGOs under UNESCO was organized in Paris, France, where UNESCO's headquarters are located.

• This conference is a biennial event that brings together UNESCO's official NGO partners to discuss and align strategies for global development and cooperation.

• Paris has hosted numerous key UNESCO events, emphasizing its role as a global center for education, culture, and science.

• The conference primarily focuses on strengthening collaboration between UNESCO and NGOs to address global challenges like education, heritage preservation, and sustainable development.

• The event serves as a platform to review and strategize UNESCO's partnership frameworks with non-governmental organizations (NGOs).

Additional Information

• UNESCO (United Nations Educational, Scientific and Cultural Organization)

• Established in 1945, UNESCO aims to promote international collaboration in education, science, and culture.

• Its headquarters is situated in Paris, France.

• UNESCO is known for its World Heritage Sites program, which recognizes culturally and naturally significant locations worldwide.

• Other key focus areas include education for all, freedom of expression, and fostering scientific cooperation.

• International Conference of NGOs

• This conference is held every two years and involves UNESCO's official NGO partners.

• It aims to assess the collective impact of NGOs in UNESCO's priority areas and discuss future collaborations.

• The conference also provides a platform to share best practices and innovative solutions for global challenges.

• It helps in aligning NGO activities with UNESCO's objectives for sustainable development.

• NGOs in partnership with UNESCO

• UNESCO collaborates with over 400 NGOs worldwide to achieve its goals in education, science, and culture.

• These NGOs play a critical role in implementing grassroots programs and providing technical expertise.

• Partnerships are based on a framework agreement that outlines specific areas of cooperation.

• UNESCO's Sustainable Development Goals (SDGs)

• UNESCO actively contributes to achieving the UN's 2030 Agenda for Sustainable Development.

• Its work focuses on Quality Education (SDG 4), Gender Equality (SDG 5), and Climate Action (SDG 13), among others.

• Partnerships with NGOs are vital for mobilizing resources and implementing SDG-related initiatives.

Q31. Answer: (d) Three

Given: Each of C, D, E, F, S, T and U has an exam on a different day of a week, starting from Monday and ending on Sunday of the same week.

1) F has the exam on Thursday.

Day	Person
Monday	
Tuesday	

Wednesday	
Thursday	F
Friday	
Saturday	
Sunday	

2) C has the exam after S and before E.

3) U has the exam after T and before D.

4) T has the exam after F.

From (1) and (4), T can be on Friday, Saturday, or Sunday.

Let's assume T is on Friday → U can be on Saturday → D on Sunday.

Now place S before C and E after C. Let S on Monday, C on Tuesday, and E on Wednesday.

Day	Person
Monday	S
Tuesday	C
Wednesday	E
Thursday	F
Friday	T
Saturday	U
Sunday	D

Now, how many people have exams between U (Saturday) and C (Tuesday)?

→ Wednesday (E), Thursday (F), Friday (T) → Total = Three persons between U and C.

Hence, the correct answer is "Option 4".

Q32. Answer: (b) Parliament

The correct answer is Parliament.

Key Points

• The authority to make laws for multi-state co-operative societies is vested in the Parliament of India.

• Multi-state co-operative societies are governed by the Multi-State Co-operative Societies Act, 2002, which was enacted by Parliament.

• Multi-state co-operative societies operate in more than one state, and hence, come under the purview of the Union List of the Indian Constitution.

• Article 246 of the Constitution assigns legislative powers over subjects in the Union List exclusively to Parliament.

• The Department of Co-operation, under the Ministry of Co-operation, oversees the implementation and regulation of laws concerning multi-state co-operative societies.

Additional Information

• Multi-State Co-operative Societies Act, 2002:

• It regulates the functioning of co-operative societies that operate across multiple states in India.

• The Act emphasizes democratic management, accountability, and transparency in co-operative societies.

• It provides provisions for registration, management, and dissolution of multi-state co-operative societies.

• Union List:

• The Union List is one of the three lists under the Seventh Schedule of the Indian Constitution.

• It contains subjects on which only Parliament has the exclusive power to legislate.

• Examples include defense, foreign affairs, atomic energy, and multi-state co-operative societies.

• Ministry of Co-operation:

• Established in July 2021 to promote and strengthen co-operative societies across India.

• Its responsibilities include formulating policies and implementing programs related to co-operatives.

• The ministry also aims to streamline processes for multi-state co-operative societies.

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• Article 246 of the Indian Constitution:

• Defines the distribution of legislative powers between Parliament and state legislatures.

• Subjects listed under the Union List are exclusively under Parliament's jurisdiction.

• Co-operative societies operating across multiple states fall under Parliament's legislative domain due to their inclusion in the Union List.

Q33. Answer: (c) Two

Given: Seven people, I, J, K, L, O, P and Q are sitting in a row, facing north.

No one sits to the right of Q.

Only three people sit between I and J.

L sits to the immediate left of J.

Only two people sit between Q and L.

K sits to the immediate right of P.

Thus, Only two people sit between O and K.

Hence, the correct answer is "Option 3".

Q34. Answer: (d) 0.685

The correct answer is 0.685.

Key Points

• India's Human Development Index (HDI) value for 2025 is projected to be 0.685, as per the Human Development Index Report.

• The HDI is a composite index measuring average achievement in three basic dimensions of human development: health, education, and standard of living.

• India's HDI has been steadily improving due to consistent progress in life expectancy, literacy rates, and per capita income.

• India is classified as a country with medium human development, given its HDI value falls between 0.550 and 0.699.

• Despite improvements, India continues to face challenges such as inequality, regional disparities, and low gender equality, which impact its overall HDI ranking.

Additional Information

• Human Development Index (HDI)

• HDI is published annually by the United Nations Development Programme (UNDP) in its Human Development Report.

• The index focuses on three dimensions: health (life expectancy), education (mean years of schooling and expected years of schooling), and standard of living (GNI per capita).

• It ranges from 0 to 1, where a higher value indicates better human development outcomes.

• India's HDI Trends

• India's HDI value has seen consistent growth over the last few decades due to government initiatives in health, education, and poverty alleviation.

• For instance, India's HDI value was 0.645 in 2019, and it has shown an upward trend despite challenges like the COVID-19 pandemic.

• Inequality-adjusted HDI (IHDI)

• IHDI accounts for inequality in the distribution of each dimension of HDI.

• India's IHDI value is typically lower than its HDI value, highlighting inequality in education, health, and income.

• Global HDI Context

• In the latest Human Development Report, countries like Norway, Ireland, and Switzerland rank highest in HDI.

• India's HDI ranking is typically around the 130-140 range, reflecting its medium level of human development compared to global peers.

Q35. Answer: (d) # = ROP, % = EBC

Given:

: OLM :: HEF : %

Analysis of Options:

Option 1) # = POP, % = EUC

For # (POP) to OLM : : HEF to % (EUC)

Since the pattern for POP to OLM (-1, -3, -3) is not the same as the pattern for HEF to EUC (-3, +16, -3), Option 1 is incorrect.

Option 2) # = RVP, % = EQZ

For # (RVP) to OLM : : HEF to % (EQZ)

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Option 3) # = RUI, % = ESA

For # (RUI) to OLM : : HEF to % (ESA)

Option 4) # = ROP, % = EBC

For # (ROP) to OLM : : HEF to % (EBC)

Thus, the analogy holds true only for Option 4 where the pattern (-3, -3, -3) is consistent for both pairs.

Hence, the correct answer is "Option 4".

Q36. Answer: (d) Three

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

Only one person sits between D and G when counted from the left of G.

H sits third to the right of I. C sits third to the left of A.

H sits to the immediate right of C. B is not an immediate neighbour of C.

Thus, Only three people sit between B and G when counted from the right of B.

Hence, the correct answer is "Option 4".

Q37. Answer: (d) 74,088

Shortcut Trick

The edge of the cube (a) = 42 m.

Volume = a^3 = 42 × 42 × 42.

Unit digit check: 2 × 2 × 2 = 8. The answer must end in 8.

Checking options, only 74,088 ends with 8.

Therefore The correct answer is 74,088 m^3.

Alternate Method

Given:

Edge of the cube (a) = 42 m

Formula Used:

Volume of a cube = $(Side)^3$

Calculations:

=> Volume = 42^3

=> Volume = 42 × 42 × 42

=> Volume = 1,764 × 42

=> Volume = 74,088 m^3

Therefore The correct answer is 74,088 m^3.

Additional Information

Surface Area of a Cube

The Total Surface Area (TSA) of a cube is $6a^2$ and the Lateral Surface Area (LSA) is $4a^2$.

Diagonal of a Cube

The length of the longest diagonal that can fit inside a cube is given by $a\sqrt{3}$.

Units of Volume

Volume is always expressed in cubic units (m^3, cm^3, etc.) as it involves three dimensions of length.

Q38. Answer: (d) Limited industrial activity, mainly concentrated in a few cities like Calcutta and Bombay

The correct answer is Limited industrial activity, mainly concentrated in a few cities like Calcutta and Bombay.

Key Points

• During the colonial period, India's industrial development was largely limited due to the exploitative economic policies of the British government.

• Industrial activity was mainly concentrated in a few urban centers like Bombay (now Mumbai), Calcutta (now Kolkata), and Madras (now Chennai).

• Heavy industries and large-scale manufacturing units were almost absent, with small-scale industries such as textiles and jute dominating the industrial landscape.

• India's domestic capital goods industry was virtually non-existent, forcing reliance on imports from Britain.

• The rural areas of India were primarily agrarian, with little to no industrial activity, leading to regional imbalances in economic development.

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Additional Information

• Drain of Wealth Theory: Proposed by Dadabhai Naoroji, it highlighted how colonial policies drained India's wealth to Britain, leaving limited resources for industrial development.

• Deindustrialization: The British systematically destroyed India's traditional handicrafts and small industries to promote British industrial goods, leading to widespread unemployment and poverty.

• Economic Exploitation: Colonial policies prioritized raw material exports (like cotton and jute) over domestic industrial growth, benefiting British industries at the expense of Indian economy.

• Railways and Ports: While infrastructure like railways and ports was developed, it primarily served colonial interests of transporting raw materials and finished goods rather than fostering industrial growth.

• Post-Independence Scenario: After independence, India focused on building a strong industrial base through initiatives like the Five-Year Plans and establishment of public sector enterprises.

Q39. Answer: (d) Switches to the next tab

The correct answer is Switches to the next tab.

Key Points

• Ctrl + Tab is a commonly used keyboard shortcut to switch to the next open tab in applications that support multiple tabs, such as web browsers, code editors, and document processors.

• It cycles through tabs in the order they are listed, moving from left to right.

• This shortcut is universally recognized across major web browsers like Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.

• In contrast, the shortcut Ctrl + Shift + Tab allows users to switch to the previous tab (from right to left).

• Using keyboard shortcuts like Ctrl + Tab significantly enhances productivity by eliminating the need to manually click on tabs with a mouse.

Additional Information

• Keyboard Shortcuts in Browsers:

• Ctrl + T: Opens a new tab.

• Ctrl + W: Closes the current tab.

• Ctrl + Shift + T: Reopens the last closed tab.

• Ctrl + 1 to Ctrl + 8: Navigates directly to a specific tab (e.g., Ctrl + 1 goes to the first tab).

• Ctrl + 9: Jumps to the last tab, regardless of its position.

• Tab Management in Applications:

• Tabbed interfaces are widely used in software applications to improve workflow and organization.

• Examples include web browsers, text editors, and spreadsheet programs.

• Switching between tabs using shortcuts saves time, especially for power users who work with multiple tabs simultaneously.

• Other Useful Shortcuts:

• Alt + Tab: Switches between open applications on Windows.

• Cmd + Tab: Switches between open applications on macOS.

• Ctrl + F4: Closes the current tab or window in applications.

• Accessibility and Efficiency:

• Keyboard shortcuts are designed to make computing faster and more accessible for all users.

• They reduce reliance on the mouse, which can be especially helpful for individuals with repetitive strain injuries.

Q40. Answer: (a) Central Pollution Control Board

The correct answer is Central Pollution Control Board.

Key Points

• In 2024, the Central Pollution Control Board (CPCB) was given enhanced powers to enforce penalties and ensure compliance with environmental regulations in India.

• The CPCB operates under the Ministry of Environment, Forest and Climate Change (MoEF&CC) and is the apex body for pollution control in the country.

• The amendments empowered the CPCB to impose stricter fines and oversee the implementation of green clearances to address environmental violations effectively.

• As part of its expanded role, the CPCB was tasked with ensuring adherence to environmental standards by industries, urban bodies, and other entities.

• The move aimed to strengthen India's capacity to tackle air, water, and soil pollution, ensuring sustainable development.

Additional Information

• Central Pollution Control Board (CPCB):

• Established in 1974 under the Water (Prevention and Control of Pollution) Act.

• It also functions under the Air (Prevention and Control of Pollution) Act, 1981.

• The CPCB advises the central government on environmental policies and coordinates with state pollution control boards.

• Environmental Clearances in India:

• Green clearances are required for activities that may have significant environmental impacts.

• These include projects in sectors like mining, infrastructure, and energy.

• The process is overseen by the Ministry of Environment, Forest and Climate Change (MoEF&CC) and the CPCB.

• Pollution in India:

• India faces challenges related to air pollution, water contamination, and waste management.

• According to the World Air Quality Report, several Indian cities rank among the most polluted globally.

• Sustainable Development Goals (SDGs):

• Goal 13 focuses on climate action, while Goal 15 emphasizes sustainable use of terrestrial ecosystems.

• Strengthening environmental regulations aligns with India's commitment to achieving these goals.

Q41. Answer: (c) 538

Shortcut Trick

Let the HCF be x.

Numbers are 2x, 1x, and 5x.

LCM of (2, 1, 5) × HCF = LCM of numbers.

10 × x = 5380

x = 538

Therefore The correct answer is 538.

Alternate Method

Given:

Ratio of three numbers = 2 : 1 : 5

LCM of the numbers = 5380

Formula Used:

If the ratio of numbers is a : b : c and their HCF is H, then the numbers are aH, bH, and cH.

LCM of (aH, bH, cH) = H × LCM(a, b, c)

Calculations:

=> Let the numbers be 2H, 1H, and 5H, where H is the HCF.

=> LCM of 2, 1, and 5 = 10 (since they are prime/co-prime to each other).

=> LCM of (2H, 1H, 5H) = 10 × H

=> 10H = 5380

=> H = 5380 ÷ 10

=> H = 538

Therefore The correct answer is 538.

Additional Information

HCF and LCM Relation

For two numbers A and B, A × B = HCF(A, B) × LCM(A, B). Note: This does not directly apply to three numbers.

Ratio and Multiples

If numbers are in ratio x : y : z, then the numbers can be expressed as kx, ky, and kz, where k is their HCF.

LCM of Fractions

LCM = LCM of Numerators ÷ HCF of Denominators.

Q42. Answer: (c) 40 hours

Shortcut Trick

Time taken by Filling Tap (A) = 8 hours

Time taken by Emptying Hole (B) = 10 hours

Combined Time = (A × B) ÷ (B − A)

Net Time = (8 × 10) ÷ (10 − 8) = 80 ÷ 2 = 40 hours

Therefore The correct answer is 40 hr.

Alternate Method

Pipe/Hole	Time (hr)	Total Work (LCM)	Efficiency
Filling Tap (+)	8	40	+5
Emptying Hole (−)	10	−4	

Given: Filling time = 8 hr, Emptying time = 10 hr.

Formula: Total Work = LCM(8, 10) = 40 units.

=> Efficiency of Filling Tap = 40 ÷ 8 = +5 units/hr

=> Efficiency of Emptying Hole = 40 ÷ 10 = −4 units/hr

=> Combined Efficiency = 5 − 4 = +1 unit/hr

=> Time taken to fill = Total Work ÷ Combined Efficiency = 40 ÷ 1 = 40 hours

Therefore The correct answer is 40 hr.

Additional Information

Net Efficiency Rule

When one pipe fills (rate x) and another empties (rate y), the net work done per hour is (1/x − 1/y) if x < y.

Pipes and Cisterns vs Time and Work

The concepts are identical, but in cisterns, work done by an outlet/leak is taken as negative work.

Q43. Answer: (b) 1, 2 and 3

The correct answer is Option 2: 1, 2 and 3.

Key Points

• National Manufacturing Policy 2011: It highlights that every job created in the manufacturing sector leads to the creation of 2-3 additional jobs in related activities, emphasizing the multiplier effect of manufacturing employment.

• Transformational Sector: Industries add value to raw materials and enhance the skill set of workers, which is why the industrial sector is considered a transformational sector in economic development.

• Employment & Poverty Eradication: Industrial development plays a critical role in generating employment and is a precondition for eradicating poverty and unemployment in India.

• The industrial sector contributes significantly to the Gross Domestic Product (GDP) and serves as a backbone for the economic progress of the country.

• Policies like Make in India and National Manufacturing Policy aim to boost industrial growth and employment generation in India.

Additional Information

• Industrial Sector Overview:

• The industrial sector includes manufacturing, construction, mining, and utilities.

• It is a key driver of economic growth, accounting for approximately 25-30% of India’s GDP.

• National Manufacturing Policy (NMP) 2011:

• Aimed at increasing the share of manufacturing in GDP to 25% by 2022.

• Focuses on skill development, technology upgrades, and creation of National Investment and Manufacturing Zones (NIMZs).

• Make in India Initiative:

• Launched in September 2014 to promote manufacturing and attract foreign investments.

• Targets 25 priority sectors including automobiles, pharmaceuticals, and textiles.

• Employment in Industrial Sector:

• Accounts for a large segment of formal and informal employment in India.

• Industrial policies aim to reduce unemployment through job creation in manufacturing and allied sectors.

• Challenges in Industrial Development:

• Infrastructure bottlenecks, skill gaps, and regulatory hurdles.

• Low levels of research and development (R&D) and technological innovation.

Q44. Answer: (a) All ministers share full responsibility for government decisions.

The correct answer is All ministers share full responsibility for government decisions.

Key Points

• Collective executive responsibility is a principle enshrined in Article 75(3) of the Indian Constitution, which states that the Council

of Ministers is collectively responsible to the Lok Sabha (House of the People).

• This principle ensures that all members of the Council of Ministers, including the Prime Minister, act as a single entity and take joint responsibility for the actions and policies of the government.

• If a decision is taken by the government, all ministers are expected to defend it publicly, even if they personally disagree with it.

• If a minister disagrees with a decision and is unwilling to defend it, the convention is that they must resign from their position.

• The principle of collective responsibility strengthens the unity of the executive and maintains the stability of the government by ensuring accountability to the legislature.

Additional Information

• Article 75(3): This article specifies that the Council of Ministers shall be collectively responsible to the Lok Sabha, ensuring that they act as a unified body in matters of governance.

• Individual Responsibility: While collective responsibility exists, each minister is also individually responsible for their respective departmental actions and policies.

• No-Confidence Motion: If the Lok Sabha passes a no-confidence motion against the Council of Ministers, the entire Council, including the Prime Minister, is required to resign, demonstrating collective accountability.

• Parliamentary Democracy: The principle of collective responsibility is a cornerstone of parliamentary democracy, ensuring that the executive remains accountable to the legislature.

• Westminster Model: India's collective responsibility principle is inspired by the Westminster model of governance, which emphasizes the unity and accountability of the executive branch.

Q45. Answer: (b) 25.2

Shortcut Trick

The relationship between Mean, Median, and Mode is defined by the ratio of their differences.

Using the empirical formula: (Mode − Median) = 2/3 × (Mode − Mean)

Given: (Mode − Mean) = 37.8

Calculation: (Mode − Median) = 2/3 × 37.8 = 2 × 12.6 = 25.2

Therefore The correct answer is 25.2.

Alternate Method

Given: Mode − Mean = 37.8

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

=> Mode − Mean = 37.8

=> Mean = Mode − 37.8

=> Mode = 3 × Median − 2 × (Mode − 37.8)

=> Mode = 3 × Median − 2 × Mode + 75.6

=> 3 × Mode − 3 × Median = 75.6

=> 3(Mode − Median) = 75.6

=> Mode − Median = 75.6 ÷ 3 = 25.2

Therefore The correct answer is 25.2.

Additional Information

Q46. Answer: (b) Deccan

The correct answer is Deccan.

Key Points

• The Rashtrakutas were a prominent dynasty that ruled large parts of the Deccan region of India from the 8th to 10th century CE.

• They established their capital at Manyakheta (modern-day Malkhed in Karnataka).

• The Rashtrakutas were known for their patronage of art and architecture, most notably the Kailasa temple at Ellora, which is a UNESCO World Heritage site.

• Under rulers like Amoghavarsha I, the Rashtrakutas achieved significant cultural, economic, and military prosperity in the Deccan region.

• Their empire extended over vast areas including parts of Maharashtra, Karnataka, Andhra Pradesh, and Tamil Nadu.

Additional Information

• Rashtrakutas Origin:

• The Rashtrakutas claimed descent from the Yadava lineage and were originally based in the Lattaluru region (modern-day Latur in Maharashtra).

• Kailasa Temple:

• This temple, carved out of a single rock, is considered an architectural marvel of the Rashtrakuta period.
• It reflects the technological and artistic prowess of ancient Indian artisans.
• Amoghavarsha I:
• One of the greatest Rashtrakuta rulers, he authored the Kannada classic Kavirajamarga.
• His reign marked the peak of Rashtrakuta cultural achievements.
• Decline of the Rashtrakutas:
• The empire eventually fell to the Chalukyas of Kalyani in the late 10th century CE.
• Their decline marked the end of one of the most influential dynasties in the Deccan.

Q47. Answer: (d) 90

Given:
Expression to evaluate: 30 - [30 - {30 - (30 - 30 × 3)}]
Formula Used:
Follow BODMAS (Bracket, Order, Division/Multiplication, Addition/Subtraction) rules to evaluate the expression.
Calculation:
30 - [30 - {30 - (30 - 30 × 3)}]
=> 30 - [30 - {30 - (30 - 90)}]
=> 30 - [30 - {30 - (-60)}]
=> 30 - [30 - {30 + 60}]
=> 30 - [30 - 90]
=> 30 - [-60]
=> 30 + 60
=> 90
Therefore Option 4 is the correct answer.

Q48. Answer: (d) Rs. 14,210

Shortcut Trick
Let the total salary be 100%.
Spending on rent = 30%. Remaining salary = 70%.
Total amount except rent = 751 + 8481 + 715 = Rs. 9,947.
Since this amount represents the remaining 70%, then 70% = 9947.
100% = 9947 ÷ 70 × 100 = 14210.
Therefore The correct answer is Rs. 14,210.
Alternate Method
Given:
House Rent = 30% of Salary
Conveyance = Rs. 751
Grocery = Rs. 8,481
Savings = Rs. 715
Let Total Monthly Salary be 'S'.
=> Total Expenditure and Savings (excluding rent) = 751 + 8481 + 715
=> Sum = Rs. 9,947
=> Percentage of salary excluding rent = 100% − 30% = 70%
=> 70% of S = 9947
=> (70 ÷ 100) × S = 9947
=> S = (9947 × 100) ÷ 70
=> S = 142.1 × 100
=> S = Rs. 14,210
Therefore The correct answer is Rs. 14,210.
Additional Information
Percentage Expenditure
Total Salary = Expenditure + Savings. If expenses are given as percentages, ensure the base is the same (Total Salary) unless 'of

the remaining' is specified.

Successive Percentage

When spending occurs on the 'remaining' amount, use the formula: Final = Initial × (1 − r1/100) × (1 − r2/100).

Base Change Rule

To find the total value from a partial percentage: Total = (Partial Value ÷ Partial Percentage) × 100.

Q49. Answer: (a) 5

The given code language is:

Thus, 'S' is coded as '5'.

Hence, the correct answer is "Option 1".

Q50. Answer: (d) NU48

The pattern followed here is.

Thus, the missing term in the series is NU48.

Hence, the correct answer is Option 4.

Q51. Answer: (d) Albert Einstein

The correct answer is Albert Einstein.

Key Points

• Albert Einstein critically examined the foundations of Newtonian mechanics and introduced revolutionary concepts that led to the development of modern physics.

• His theory of special relativity (1905) challenged Newtonian mechanics by introducing the constancy of the speed of light and the relativity of simultaneity.

• Einstein's work revealed that Newtonian mechanics fails at speeds approaching the speed of light and in strong gravitational fields, leading to the development of general relativity (1915).

• The equivalence principle, a cornerstone of general relativity, contradicted Newton's concept of absolute space and time.

• Einstein's contributions fundamentally reshaped the understanding of space, time, and energy, pushing science beyond the classical framework established by Newton.

Additional Information

• Newtonian Mechanics:

• A classical physics framework developed by Sir Isaac Newton, describing motion using laws of inertia, force, and action-reaction.

• It assumes absolute space and time, which Einstein later challenged.

• Special Relativity:

• Developed by Albert Einstein in 1905, it introduced concepts like time dilation, length contraction, and $E=mc^2$.

• It applies to objects moving at constant speeds close to the speed of light.

• General Relativity:

• Published by Einstein in 1915, it describes gravity as the curvature of spacetime caused by mass and energy.

• It replaced Newton's law of universal gravitation in explaining phenomena like black holes and cosmic expansion.

• Equivalence Principle:

• A concept in general relativity stating that gravitational force and acceleration are indistinguishable.

• It played a key role in Einstein's departure from Newtonian mechanics.

• Impact on Modern Physics:

• Einstein's work laid the foundation for quantum mechanics, cosmology, and advancements in theoretical physics.

• His discoveries opened new avenues in understanding the universe at both macroscopic and microscopic scales.

Q52. Answer: (c) Improved ability to handle and execute multiple separate processes concurrently

The correct answer is Improved ability to handle and execute multiple separate processes concurrently.

Key Points

• Multi-core processors allow multiple cores to work independently, enabling efficient execution of multiple independent tasks simultaneously.

• This architecture reduces bottlenecks caused by task switching in single-core systems, improving overall system performance.

• Each core operates as a separate processing unit, facilitating better multitasking and parallel processing capabilities.

• Multi-core systems are especially advantageous in environments requiring concurrent execution of multiple processes, such as servers or multimedia applications.

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• While clock speed remains the same, multiple cores ensure more tasks are processed in parallel, leading to better utilization of system resources.

Additional Information

• Core: A core is a processing unit within a CPU that performs computational tasks. Multi-core CPUs contain multiple cores in a single chip.

• Parallel Processing: The simultaneous execution of multiple processes or tasks by dividing them across multiple cores to improve efficiency.

• Hyper-threading: A technology used in some processors to enable a single core to handle multiple threads, though it does not replace the advantages of physical multi-core systems.

• Single-core vs Multi-core: Single-core processors execute one thread at a time, whereas multi-core processors can execute multiple threads or tasks concurrently.

• Applications: Multi-core processors are widely used in high-performance computing, gaming, video editing, and server systems requiring multitasking and parallel workloads.

Q53. Answer: (d) Bronze

The correct answer is Bronze.

Key Points

• The 'Dancing Girl' statue is a significant artifact from the Indus Valley Civilization, which dates back to around 2500 BCE.

• It is made of bronze using the lost-wax casting technique, showcasing advanced metallurgical skills of the civilization.

• The statue is approximately 4 inches tall and depicts a young girl in a confident, relaxed pose.

• This artifact was discovered in Mohenjo-daro, one of the major urban centers of the Indus Valley Civilization.

• The 'Dancing Girl' is celebrated for its realistic portrayal of human anatomy and artistic sophistication.

Additional Information

• Indus Valley Civilization: It is one of the world's oldest urban civilizations, flourishing between 2500 BCE and 1900 BCE in regions of present-day Pakistan and northwest India.

• Lost-Wax Casting Technique: This is a method of metal casting where a wax model is covered with clay and fired to create a mold. Molten metal is then poured into the mold to create the artifact.

• Mohenjo-daro: An archaeological site in Sindh, Pakistan, and a major urban center of the Indus Valley Civilization known for its advanced city planning and architecture.

• An alloy primarily consisting of copper and tin, widely used in ancient civilizations for making tools, weapons, and artifacts due to its durability and workability.

• Artistic Significance: The 'Dancing Girl' is considered a masterpiece of ancient Indian art, reflecting the cultural and artistic achievements of the Indus Valley Civilization.

Q54. Answer: (d) Diwan-i-khas

The correct answer is Diwan-i-Khas.

Key Points

• Diwan-i-Khas was a private hall used by Islamic rulers, specifically for confidential meetings and royal audiences.

• It served as a venue where the emperor met his ministers, nobles, and other important officials to discuss state affairs privately.

• The design of Diwan-i-Khas reflected grandeur and exclusivity, symbolizing the ruler’s authority and status.

• Famous examples of Diwan-i-Khas can be found in Mughal architecture, such as the Red Fort in Delhi and Fatehpur Sikri.

• Unlike Diwan-i-Aam (Hall of Public Audience), which was open to the general public, Diwan-i-Khas was highly restricted and accessible only to select individuals.

Additional Information

• Sarai: Sarais were rest houses or inns constructed along trade routes to provide lodging and essential facilities to travelers, traders, and pilgrims.

• Katra: Katras were market complexes or caravanserais often used for commercial purposes. They were designed to accommodate traders and store goods.

• Bridges: Bridges constructed during the Islamic reign were primarily for public use, facilitating transportation and trade over rivers and other obstacles.

• Diwan-i-Aam: Unlike Diwan-i-Khas, the Diwan-i-Aam was a public hall where the emperor addressed grievances and petitions from common people.

• Architectural Significance: Structures like Diwan-i-Khas exemplify the blend of Persian, Islamic, and Indian architectural styles, showcasing intricate designs, inlaid marble work, and decorative arches.

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Q55. Answer: (c) 3

Given series:

(Left) * 6 8 @ 1 £ 9 5 3 @ $ 9 © @ 7 9 £ @ 9 1 £ 6 (Right)

Condition to be checked:

Symbols which are immediately preceded by a number and also immediately followed by a number.

Number → Symbol → Number

• 6 8 @ 1 £ 9 5 3 @ $ 9 © @ 7 9 £ @ 9 1 £ 6

Hence, "3" is the correct answer.

Mistake Points

Immediately preceded by means immediately before or to come just before.

Immediately followed by means immediately after or to come just after.

Q56. Answer: (a) Neither conclusion (I) nor (II) follows.

Statements:

All boys are handsome.

Some handsome are cars.

Some cars are grey.

The least possible Venn Diagram is given:

Conclusions:

(I) All handsome are boys - False(because all boys are handsome is given. it implies that some handsome are boys not all).

(II) All cars are handsome - False(some handsome are cars, so it can be possible only).

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

Hence, the correct answer is "Option 1".

Q57. Answer: (a) 30 June 2025

The correct answer is 30 June 2025.

Key Points

• The Ministry of Corporate Affairs (MCA) in India extended the deadline for private companies to dematerialise their securities to 30 June 2025.

• Dematerialisation is a process wherein physical certificates of securities are converted into electronic form.

• This extension was announced in February 2025 to provide private companies with adequate time to comply with regulations.

• The previous deadline for dematerialisation of securities was set earlier but has been extended for better implementation and compliance.

• Private companies are required to ensure their securities are held in electronic form through a depository participant registered with SEBI.

Additional Information

• Dematerialisation of Securities:

• Dematerialisation eliminates the risks associated with holding physical certificates, such as loss, theft, or forgery.

• Securities in electronic format are managed through depositories like NSDL (National Securities Depository Limited) and CDSL (Central Depository Services Limited).

• It facilitates easier transfer, trading, and monitoring of securities.

• Depository Participant:

• A Depository Participant (DP) acts as an intermediary between the investor and the depository.

• Registered with SEBI, DPs provide services like opening demat accounts, transferring securities, and holding securities electronically.

• SEBI's Role:

• The Securities and Exchange Board of India (SEBI) regulates securities markets in India and ensures compliance with dematerialisation guidelines.

• SEBI mandates dematerialisation to promote transparency and efficiency in the trading of securities.

• Benefits of Dematerialisation:

• Ensures safe storage and easy transfer of securities.

• Helps reduce paperwork and administrative costs associated with physical certificates.

• Enhances market liquidity and facilitates faster settlement of transactions.

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Q58. Answer: (c) $200 billion annually for biodiversity conservation

The correct answer is $200 billion annually for biodiversity conservation.

Key Points

• During the extended session of COP16 in Rome, member nations agreed to allocate $200 billion annually for biodiversity conservation.

• This financial commitment aims to address the ongoing global biodiversity crisis, including habitat loss, species extinction, and ecosystem degradation.

• The funding will support initiatives like restoration of ecosystems, protection of endangered species, and sustainable management of natural resources.

• The decision aligns with the objectives of the Convention on Biological Diversity (CBD) to protect 30% of the planet's land and marine areas by 2030, also known as the "30x30" target.

• Countries were encouraged to mobilize resources from both public and private sectors to meet this ambitious goal.

Additional Information

• Convention on Biological Diversity (CBD):

• An international treaty adopted in 1992 at the Earth Summit in Rio de Janeiro.

• Aims to conserve biodiversity, promote sustainable use of its components, and ensure fair sharing of benefits arising from genetic resources.

• The CBD has been ratified by 196 nations, making it a globally recognized framework for biodiversity protection.

• 30x30 Target:

• A global initiative to protect at least 30% of Earth's land and ocean areas by 2030.

• Proposed under the Global Biodiversity Framework to halt and reverse biodiversity loss.

• Focuses on safeguarding key biodiversity hotspots and ecosystems critical for climate regulation.

• Global Biodiversity Crisis:

• According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), over 1 million species are at risk of extinction.

• Major drivers include deforestation, climate change, pollution, and overexploitation of natural resources.

• Urgent action is necessary to prevent irreversible damage to ecosystems and biodiversity.

• Funding Mechanisms:

• Countries are urged to mobilize financial resources through mechanisms like green bonds, biodiversity trust funds, and public-private partnerships.

• International organizations like the Global Environment Facility (GEF) and Green Climate Fund (GCF) play a pivotal role in financing biodiversity initiatives.

Q59. Answer: (a) 7 km towards the east

Given:

Mr. K starts from Point Z and drives 6 km towards the north.

He then takes a right turn, drives 3 km, turns right and drives 11 km.

He then takes a right turn and drives 10 km.

He then takes a final right turn, drives 5 km and stops at Point B.

Thus, he should drive 7 km towards the east in order to reach Point Z again.

Hence, the correct answer is "Option 1".

Q60. Answer: (d) 869

Given interchange rules:

• '+' and '−' are interchanged.

• '×' and '÷' are interchanged.

The given equation is:

186 ÷ 5 + 189 × 3 − 2 = ?

Replace the operators with their corresponding new meanings:

186 × 5 − 189 ÷ 3 + 2 = ?

Now, we solve the equation following the BODMAS rule:

= 186 × 5 − 189 ÷ 3 + 2

= 930 − 63 + 2

= 867 + 2

= 869

Hence, the correct answer is "Option 4".

Q61. Answer: (a) YX -7

The logic followed in this pattern involves consistent alphabetical shifts for the letters and an arithmetic operation for the number:

• For the first letter, it shifts +2 positions forward in the English alphabetical order.

• For the second letter, it shifts +3 positions forward in the English alphabetical order.

• For the number, it increases by +9.

Let's verify this logic with the given examples:

For 'NW -19' related to 'PZ -10':

For 'RD -12' related to 'TG -3':

The consistent pattern observed is: First letter +2, Second letter +3, Number +9.

Similarly, 'WU -2':

Thus, 'WU -2' is related to YX 7.

Hence, The correct answer is "Option 1"

Q62. Answer: (a) 2 : 2

The correct answer is Option 1: 2 : 2.

Key Points

• The balanced chemical equation for the reaction is: $2Al + 3Cl_2 \rightarrow 2AlCl_3$.

• In the reaction, two moles of aluminium (Al) react with three moles of chlorine gas (Cl_2) to produce two moles of aluminium chloride ($AlCl_3$).

• The mole ratio of aluminium (Al) to aluminium chloride ($AlCl_3$) is 2:2, which simplifies to 1:1.

• This ratio indicates that for every two moles of aluminium, two moles of aluminium chloride are formed.

• The correct option is Option 1: 2 : 2, as it directly reflects the stoichiometric coefficients in the balanced equation.

Additional Information

• Stoichiometry: The branch of chemistry that deals with the quantitative relationships between reactants and products in a chemical reaction.

• Mole Ratio: Derived from the coefficients of the balanced chemical equation and represents the proportional relationship between substances involved in the reaction.

• Balanced Equation: Ensures the conservation of mass, where the number of atoms for each element is the same on both sides of the equation.

• Reaction Details: Aluminium reacts with chlorine gas to form aluminium chloride, an ionic compound commonly used in chemical synthesis and industrial processes.

• Limiting Reactant Concept: In practical scenarios, the reactant present in a lower stoichiometric quantity may limit the amount of product formed, but this does not affect the mole ratio derived from the balanced equation.

Q63. Answer: (c) (43, 40, 23)

The logic followed in the given sets is:

Logic: Middle number = (First number - Last number) × 2.

(41, 34, 24)

→ (41 - 24) × 2

→ 17 × 2 = 34

(63, 80, 23)

→ (63 - 23) × 2

→ 40 × 2 = 80

Now, let's apply this logic to the given options:

1) (17, 2, 19)

→ (17 - 19) × 2

→ -2 × 2 = -4 ≠ 2. Incorrect.

2) (46, 86, 24)

→ (46 - 24) × 2

→ 22 × 2 = 44 ≠ 86. Incorrect.

3) (43, 40, 23)

→ (43 - 23) × 2

→ 20 × 2 = 40 = 40. This holds.

4) (17, 14, 11)

→ (17 - 11) × 2

→ 6 × 2 = 12 ≠ 14. Incorrect.

Hence, the correct answer is "Option 3".

Q64. Answer: (a) a Muslim sovereignty in Deccan

The correct answer is a Muslim sovereignty in Deccan.

Key Points

• The Nizam of Hyderabad ruled one of the largest princely states in India, and his administration projected Muslim sovereignty in the Deccan, emphasizing Islamic traditions.

• The Nizam's dynasty traced its origins to the Mughal Empire and sought to maintain its cultural and political identity within the predominantly Hindu-majority region of the Deccan.

• The Nizam focused on protecting and promoting Islamic culture while maintaining a stable governance structure in his territory.

• Hyderabad became a hub for Islamic scholarship, architecture, and cultural preservation during the Nizam's reign.

• Despite projecting Islamic sovereignty, the Nizam's administration included significant interactions with the British colonial powers to ensure political stability and economic trade benefits.

Additional Information

• Hyderabad State:

• Hyderabad was the largest princely state in India during British rule, covering areas of present-day Telangana, Karnataka, and Maharashtra.

• The state was ruled by the Nizam and known for its wealth, cultural diversity, and strategic importance.

• Nizam's Dynasty:

• The Nizam of Hyderabad belonged to the Asaf Jah dynasty, which was established in 1724.

• The dynasty maintained strong ties with the Mughal Empire and later with the British colonial rulers.

• British Protectorate:

• While the Nizam projected Islamic sovereignty, Hyderabad operated as a British protectorate under the subsidiary alliance system.

• The British provided military protection to the Nizam in exchange for control over the state's foreign affairs.

• Cultural Contributions:

• The Nizam's rule contributed to significant architectural landmarks like the Charminar and Mecca Masjid in Hyderabad.

• Hyderabad emerged as a center for Urdu literature, Islamic education, and cultural synthesis during this period.

Q65. Answer: (c) 6,000

Shortcut Trick

Convert rate to fraction: Rate (R) = 10% = 1/10.

For 3 years, let Principal = 10^3 = 1000 units.

Difference (D) between CI and SI = 3(10) + 1 = 31 units.

Given 31 units = Rs. 186 => 1 unit = Rs. 6.

Principal = 1000 units × 6 = Rs. 6000.

Therefore The correct answer is Rs. 6000.

Alternate Method

Given: Time (T) = 3 years, Rate (R) = 10% p.a., Difference (D) = Rs. 186.

Formula Used: Difference (D) = $P \times (R/100)^2 \times (3 + R/100)$

Calculations:

=> $186 = P \times (10/100)^2 \times (3 + 10/100)$

=> $186 = P \times (1/100) \times (3.1)$

=> $186 = P \times (3.1 / 100)$

=> $P = (186 \times 100) \div 3.1$

=> $P = 18600 \div 3.1$

=> $P = 186000 \div 31$

=> P = Rs. 6000.

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Therefore The correct answer is Rs. 6000.

Additional Information

2-Year Difference Formula

The difference between Compound Interest and Simple Interest for 2 years is $D = P \times (R/100)^2$.

Effective Rate of Interest

For a 10% Rate, the Effective CI Rate for 3 years is 33.1%, while the SI Rate is 30%.

Compound Interest Ratio Method

CI for 2 years follows the ratio 2:1 and for 3 years follows 3:3:1 on the calculated interest steps.

Q66. Answer: (c) 12.30%

Shortcut Trick

Use the relation between Marked Price (MP) and Cost Price (CP): MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%).

Ratio of MP to CP is 122 : 100 based on the 22% markup.

122 ÷ 100 = (100 + 7) ÷ (100 − D).

122 × (100 − D) = 107 × 100 => 12200 − 122D = 10700.

122D = 1500 => D = 1500 ÷ 122 ≈ 12.295%.

Therefore The correct answer is 12.30%.

Alternate Method

Given → Marked Price (MP) = Rs. 668, Markup = 22%, Profit = 7%.

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

=> Let Cost Price (CP) be x. Since MP is 22% above CP, 1.22x = 668 => x = 668 ÷ 1.22 ≈ 547.54.

=> Selling Price (SP) = CP × (107 ÷ 100) = 547.54 × 1.07 ≈ 585.87.

=> Discount Amount = MP − SP = 668 − 585.87 = 82.13.

=> Discount Percentage = (82.13 ÷ 668) × 100 ≈ 12.295%.

Therefore The correct answer is 12.30%.

Additional Information

Relation between CP, MP, Profit and Discount

The most efficient way to solve such problems is the ratio MP/CP = (100 + P%)/(100 - D%) which bypasses the need for actual currency values.

Marked Price

It is the price displayed on the product. Discounts are always calculated on the Marked Price, while profit or loss is calculated on the Cost Price.

Q67. Answer: (d) 41

Shortcut Trick

Total distance = 819 + 1476 + 1053 = 3348 km

Total time = Total distance ÷ Average speed = 3348 ÷ 54 = 62 hours

Time for 1st and 3rd parts = (819 ÷ 63) + (1053 ÷ 81) = 13 + 13 = 26 hours

Time for 2nd part = 62 − 26 = 36 hours

x = 1476 ÷ 36 = 41 km/hr

Therefore The correct answer is 41 km/hr.

Alternate Method

Given:

Distances: D1 = 819 km, D2 = 1476 km, D3 = 1053 km

Speeds: S1 = 63 km/hr, S2 = x km/hr, S3 = 81 km/hr

Average Speed (V_(avg)) = 54 km/hr

Formula Used:

Average Speed = Total Distance ÷ Total Time

Time = Distance ÷ Speed

Calculations:

=> Total Distance = 819 + 1476 + 1053 = 3348 km

=> Total Time (T) = 3348 ÷ 54 = 62 hours

=> T1 = 819 ÷ 63 = 13 hours

=> T3 = 1053 ÷ 81 = 13 hours

=> T2 = T − (T1 + T3) = 62 − (13 + 13) = 62 − 26 = 36 hours

=> Speed x = D2 ÷ T2 = 1476 ÷ 36

=> x = 41 km/hr

Therefore The correct answer is 41 km/hr.

Additional Information

Average Speed for Equal Distances

If two equal distances are covered at speeds u and v, then Average Speed = 2uv ÷ (u + v).

Relative Speed

In the same direction, relative speed = S1 − S2. In the opposite direction, relative speed = S1 + S2.

Unit Conversion

To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Q68. Answer: (d) 45

Shortcut Trick

Initial Average of 36 numbers = 45.

Sum of discarded numbers = 37 + 53 = 90.

Average of the two discarded numbers = 90 ÷ 2 = 45.

If the average of the discarded items is equal to the group average, the average of the remaining items does not change.

Therefore The correct answer is 45.

Alternate Method

Given:

Total numbers = 36 | Initial Average = 45

Numbers to be discarded = 37 and 53

Formula Used:

Average = Total Sum ÷ Number of Observations

Calculations:

=> Total Sum of 36 numbers = 36 × 45 = 1620

=> Sum of discarded numbers = 37 + 53 = 90

=> Remaining Sum = 1620 − 90 = 1530

=> Remaining Numbers = 36 − 2 = 34

=> New Average = 1530 ÷ 34

=> New Average = 45

Therefore The correct answer is 45.

Additional Information

Constant Removal Property

If the average of discarded items is exactly equal to the original average, the mean of the remaining data set remains constant.

Weighted Average Formula

Average_(combined) = (n1A1 + n2A2) ÷ (n1 + n2), where n is the count and A is the average.

Deviation Method

The sum of deviations of all observations from their mean is always zero. If discarded items have zero net deviation from the mean, the average stays the same.

Q69. Answer: (c) Heraka Movement - West Bengal

The correct answer is Heraka Movement - West Bengal.

Key Points

• The Heraka Movement was not based in West Bengal but originated in the Naga Hills of Assam and Nagaland.

• This socio-religious movement was led by Jadonang and later Rani Gaidinliu with the aim of reviving Naga traditions and customs.

• The movement also sought to oppose British colonial rule and Christian missionary influence in the region.

• Heraka, meaning "pure," was a reformist movement that sought to consolidate the indigenous Naga religious practices and reject foreign influence.

Additional Information

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• Ramosi Rebellion
• The Ramosi Rebellion (1822-1841) took place in Maharashtra.
• It led by Chittur Singh and Umaji Naik, was a response to British annexation policies in the Western Ghats.
• The Ramosis were a tribal community employed as hill police during Maratha rule but were marginalized under British rule.
• Lushai Revolt
• This revolt occurred in the present-day Mizoram (then part of Assam) during the 19th century.
• The Lushai tribes resisted British interference in their territory and culture.
• The British eventually subdued the rebellion and brought the region under their control.
• Kol Rebellion
• The Kol Rebellion (1831-1832) was centered in Jharkhand.
• The rebellion was led by the Kol tribal community against exploitative landlords and moneylenders.
• It was a significant tribal uprising during British colonial rule.
• Heraka Movement Leadership
• Jadonang was the founder of the Heraka Movement and sought to preserve Naga culture.
• After his execution by the British, Rani Gaidinliu became the leader and continued the fight for Naga identity and freedom.
• Rani Gaidinliu is remembered as a freedom fighter and was posthumously awarded the Padma Bhushan.

Q70. Answer: (b) Rs. 616

Shortcut Trick
Total cost: 10 bags + 10 pens = Rs. 1310 => 1 bag + 1 pen = Rs. 131.
Multiply by 2: 2 bags + 2 pens = Rs. 262.
Compare with first case: (2 bags + 11 pens) − (2 bags + 2 pens) = 505 − 262 => 9 pens = Rs. 243.
Cost of 1 pen = Rs. 27, and 1 bag = 131 − 27 = Rs. 104.
Difference for 8 units = 8 × (104 − 27) = 8 × 77 = Rs. 616.
Therefore The correct answer is Rs. 616.
Alternate Method
Given:
2B + 11P = 505 (Equation 1)
10B + 10P = 1310 (Equation 2)
From Equation 2, simplify by dividing by 10:
=> B + P = 131 => B = 131 − P
Substitute B in Equation 1:
=> 2(131 − P) + 11P = 505
=> 262 − 2P + 11P = 505
=> 9P = 505 − 262
=> 9P = 243 => P = 27
Now, find the cost of the bag:
=> B = 131 − 27 = 104
Calculate the required difference:
=> 8B − 8P = 8(B − P)
=> 8(104 − 27) = 8 × 77
=> 8 × 77 = 616
Therefore The correct answer is Rs. 616.
Additional Information
Linear Equations in Two Variables
These are equations of the form ax + by = c. They can be solved using elimination, substitution, or cross-multiplication methods.
Cost Difference Logic
The difference of costs for multiple items n(B − P) is always n times the difference of single item costs (B − P).
Substitution Method
Express one variable in terms of the other from the simpler equation and substitute it into the complex one to reduce the system to a single variable.

Q71. Answer: (b) 12.5

Shortcut Trick

Total interest for 2 years = Rs. 4,000

Interest for 1 year = 4,000 ÷ 2 = Rs. 2,000

Rate (x) = (Interest for 1 year ÷ Principal) × 100

x = (2,000 ÷ 16,000) × 100 = 1/8 × 100 = 12.5%

Therefore The correct answer is 12.5.

Alternate Method

Given:

Principal (P) = Rs. 16,000

Simple Interest (SI) = Rs. 4,000

Time (T) = 2 years

Rate of Interest (R) = x% per annum

Formula Used:

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

Calculations:

=> 4,000 = (16,000 × x × 2) ÷ 100

=> 4,000 = 160 × 2 × x

=> 4,000 = 320 × x

=> x = 4,000 ÷ 320

=> x = 400 ÷ 32

=> x = 100 ÷ 8

=> x = 12.5

Therefore The correct answer is 12.5.

Additional Information

Simple Interest Formula

SI = (P × R × T) / 100, where P is Principal, R is Rate, and T is Time.

Amount in Simple Interest

Amount (A) = Principal (P) + Simple Interest (SI). It represents the total money repaid.

Rate of Interest Definition

The Rate of Interest is the percentage of the principal charged as interest for a specific period (usually per annum).

Q72. Answer: (a) Lucknow

The correct answer is Lucknow.

Key Points

• As per Census of India 2001, Million Plus Urban Agglomerations Cities are those urban areas with a population exceeding one million.

• Lucknow, the capital city of Uttar Pradesh, was identified as one of the Million Plus Urban Agglomerations Cities in the Census 2001.

• Lucknow's population crossed the one million mark during the 2001 census, making it eligible for this classification.

• Other notable cities like Chandigarh also fall under this category, but Lucknow specifically satisfies the criteria for the given question.

• Million Plus Cities are significant for urban planning and resource allocation by the government.

Additional Information

• Urban Agglomeration:

• An Urban Agglomeration (UA) consists of a core city and its adjoining areas forming a continuous urban spread.

• It includes the main city, towns, and outgrowths (like railway colonies, university campuses, etc.) linked to the urban core.

• Million Plus Cities:

• These cities have populations exceeding one million as per Census data.

• Such cities are key focus areas for infrastructure development under schemes like Smart Cities Mission.

• Census of India:

• The Census is conducted every 10 years to collect demographic, social, and economic data.

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• Census 2001 was the 14th National Census exercise conducted in India.
• Importance of Million Plus Cities:
• These cities are crucial for economic activities, governance, and urban development.
• They often serve as hubs for trade, education, healthcare, and employment opportunities.

Q73. Answer: (c) Malwa

The correct answer is Malwa.

Key Points

• The Malwa Plateau is located in the central part of India and lies between the Aravali and Vindhya ranges.
• It is primarily spread across the states of Madhya Pradesh and Rajasthan, with some portions extending into Gujarat.
• The plateau is characterized by black soil, which is highly fertile and suitable for agriculture, particularly for crops like wheat, cotton, and soybean.
• This region is also known for its geological significance, being a part of the Deccan Traps, which are made up of volcanic basalt rock.
• Key rivers such as the Chambal, Kali Sindh, and Parbati originate or flow through the Malwa Plateau, enriching the region's agriculture.

Additional Information

• Aravali Range:
• One of the oldest mountain ranges in the world, running diagonally across Rajasthan and parts of Haryana and Gujarat.
• It acts as a natural barrier, influencing the climate and biodiversity of the region.
• Vindhya Range:
• A mountain range running parallel to the Narmada River, forming the southern boundary of the Malwa Plateau.
• It is geologically younger than the Aravali range and influences the northern boundary of the Deccan Plateau.
• Deccan Traps:
• A large igneous province in west-central India, formed due to volcanic activity around 66 million years ago.
• The basaltic rock formations contribute to the region's black soil, which is ideal for agriculture.
• Key Cities:
• Important cities located in the Malwa Plateau include Indore, Ujjain, Ratlam, and Neemuch.
• Ujjain is a major religious and cultural hub, known for the Mahakaleshwar Jyotirlinga.
• Economic Significance:
• The plateau is rich in mineral resources like limestone and is a hub for cement production.
• It also plays a crucial role in agriculture, being one of the most fertile regions in central India.

Q74. Answer: (a) 4

Given series:

(Left) * 1 * $ 2 3 7 £ 1 7 @ 4 9 9 * 6 * 3 $ 1 $ @ (Right)

Condition to be checked:

Numbers which are immediately preceded by a symbol and also immediately followed by a symbol.

Symbol → Number → Symbol

• 1 * $ 2 3 7 £ 1 7 @ 4 9 9 * 6 * 3 $ 1 $ @
• 1 *
• 6 *
• 3 $
$ 1 $

Hence, "4" is the correct answer.

Mistake Points

Immediately preceded by means immediately before or to come just before.

Immediately followed by means immediately after or to come just after.

Q75. Answer: (a) 867

Shortcut Trick

Use the ratio-unitary method based on Selling Price (SP) percentage.

Given Gain% = 34%, so SP = 134% of Cost Price (CP).

If 134% => Rs. 3,417, then 1% => 3,417 ÷ 134 = Rs. 25.5.
Profit is 34%, so Profit = 34 × 25.5 = Rs. 867.
Therefore The correct answer is Rs. 867.
Alternate Method
Given: Sales proceeds (SP) = Rs. 3,417, Gain% = 34%.
Formulas: CP = [SP × 100] ÷ [100 + Gain%] | Profit = SP − CP.
=> Let Cost Price (CP) be x.
=> Selling Price (SP) = x + 34% of x = 1.34x.
=> 1.34x = 3,417 => x = 3,417 ÷ 1.34 = Rs. 2,550.
=> Profit = SP − CP = 3,417 − 2,550 = Rs. 867.
Therefore The correct answer is Rs. 867.
Additional Information
Relation between SP, CP and Profit
Profit is always calculated on the Cost Price unless stated otherwise. Profit = (Profit% ÷ 100) × CP.
Fractional Method
34% can be written as 34/100 or 17/50. Here, 50 is CP and 17 is Profit, making SP = 67 units.

Q76. Answer: (b) 4

Given: Seven boxes, A, B, C, D, E, F, and G, are kept one over the other but not necessarily in the same order.
1) Only two boxes are kept between G and B.
2) Only A is kept above F → A is at the top, F is second from the top.
3) No box is kept below B → B is at the bottom (7th position).
4) E is kept in some place below C but in some place above D → C > E > D.

A
F
C
G
E
D
B

E is at position 5 → Boxes above E = A, F, C, G → Total = 4 boxes.
Hence, the correct answer is "Option 2".

Q77. Answer: (b) YT −1

Let's verify this logic with the given examples:
For 'IL 17' related to 'LN 12':
For 'MN 12' related to 'PP 7':
The consistent pattern observed is: First letter +3, Second letter +2, Number -5.
Similarly, 'VR 4':
Thus, 'VR 4' is related to YT -1.
Hence, the correct answer is "Option 2".

Q78. Answer: (b) Bitra

The correct answer is Bitra.
Key Points
• According to the 2011 Census, Bitra is the smallest inhabited island in the Lakshadweep archipelago in terms of population.
• The population of Bitra was recorded as only 271 people, making it the least populous among all islands in Lakshadweep.
• Bitra is geographically the smallest inhabited island, covering an area of approximately 0.105 square kilometers.
• The island serves primarily as a fishing village, with a small number of families residing there.
• The nearest inhabited island to Bitra is Chetlat, which is located approximately 50 kilometers away.

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Additional Information

• About Lakshadweep:

• It is a union territory of India consisting of 36 islands, of which only 10 are inhabited.

• Lakshadweep is located in the Arabian Sea, about 200-440 km off the southwestern coast of India.

• The islands are known for their coral atolls, reefs, and lagoons, which make them ecologically and economically significant.

• Census in India:

• The Census of India is conducted every 10 years, with the latest available data from the 2011 Census.

• It provides vital information on population, demographics, literacy, and socioeconomic parameters.

• Bitra's Unique Demographics:

• Bitra has the highest sex ratio among all islands in Lakshadweep, with 1,384 females per 1,000 males as per the 2011 Census.

• The small population size makes it a closely-knit community.

• Economic Activities in Lakshadweep:

• The primary livelihood of the inhabitants is fishing, followed by coconut cultivation.

• The region also promotes sustainable tourism to preserve its fragile ecosystem.

Q79. Answer: (c) 8

Given number: '3518642'

Condition to be applied:

• If the digit is odd, add 1.

• If the digit is even, subtract 2.

After applying the condition to each digit:

Digits	**3**	**5**	**1**	**8**	**6**	**4**	**2**
Operation	+1	+1	+1	-2	-2	-2	-2
New number	4	6	2	6	4	2	0

Now, the digits second from the left and second from the right in the new number are:

• Second from the left: 6

• Second from the right: 2

Sum of 6 and 2 is: 8.

Hence, the correct answer is "Option 3".

Q80. Answer: (c) RX – VP

The logic followed here is:

Option (1) 'NT – QL':

Option (2) 'GM – JE':

Option (3) 'RX – VP':

Here, it does not follow.

Option (4) 'AG – DY':

Hence, the correct answer is "Option 3".

Q81. Answer: (c) 22°

Shortcut Trick

For complementary angles, if sin X = cos Y, then X + Y = 90°.

Given: sin 5A = cos(A − 42°)

=> 5A + (A − 42°) = 90°

=> 6A = 132°

=> A = 22°

Therefore The correct answer is 22°.

Alternate Method

Given: sin 5A = cos(A − 42°)

Formula Used: sin θ = cos(90° − θ)

=> cos(90° − 5A) = cos(A − 42°)

Comparing the angles:

=> 90° − 5A = A − 42°

=> 90° + 42° = A + 5A

=> 132° = 6A

=> A = 132° ÷ 6

=> A = 22°

Therefore The correct answer is 22°.

Additional Information

Complementary Angle Identities

Trigonometric ratios of complementary angles: sin(90°−θ) = cosθ, tan(90°−θ) = cotθ, and sec(90°−θ) = cosecθ.

Acute Angle Condition

When it is stated that an angle is acute (less than 90°), it ensures we are working within the first quadrant where these identities are directly applicable.

Sum of Angles Rule

If sin α = cos β, then α + β = 90° (given both are acute). Similarly, if tan α = cot β, then α + β = 90°.

Q82. Answer: (d) 1

Given number: '8514932'

After arranged in descending order:

Digits	**8**	**5**	**1**	**4**	**9**	**3**	**2**
Descending order	9	8	5	4	3	2	1

Now, comparing the original number and the new number: Only 1 digit remains at same place "4".

Thus, there are 1 digits (4) that remain unchanged in position.

Hence, the correct answer is "Option 4".

Q83. Answer: (a) 10 km/hr

Shortcut Trick

Upstream Speed (u) = 14 ÷ 14 = 1 km/hr

Downstream Speed (v) = 171 ÷ 9 = 19 km/hr

Still Water Speed = (u + v) ÷ 2 = (1 + 19) ÷ 2 = 10 km/hr

Therefore The correct answer is 10 km/hr.

Alternate Method

Given:

Upstream distance = 14 km, Upstream time = 14 hours

Downstream distance = 171 km, Downstream time = 9 hours

Formula Used:

Speed = Distance ÷ Time

Speed in Still Water (x) = (Downstream Speed + Upstream Speed) ÷ 2

Calculations:

=> Upstream Speed (u) = 14 km ÷ 14 hr = 1 km/hr

=> Downstream Speed (v) = 171 km ÷ 9 hr = 19 km/hr

=> Speed of boat in still water (x) = (19 + 1) ÷ 2

=> x = 20 ÷ 2

=> x = 10 km/hr

Therefore The correct answer is 10 km/hr.

Additional Information

Speed of Stream

The speed of the current or stream (y) is calculated as half the difference between downstream and upstream speeds: y = (v − u) ÷ 2.

Relative Speed in Water

Downstream speed = Speed of boat + Speed of stream (x + y); Upstream speed = Speed of boat − Speed of stream (x − y).

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Average Speed of Boat

If a boat travels a certain distance and returns to the starting point, Average Speed = (u × v) ÷ x, where x is speed in still water.

Q84. Answer: (a) 4171

Shortcut Trick

Directly multiply Base and Height to find the Area.

Area = 97 × 43

Unit digit check: 7 × 3 = 21 (Last digit must be 1).

97 × 43 = (100 − 3) × 43 = 4300 − 129 = 4171

Therefore The correct answer is 4171 cm².

Alternate Method

Given:

Base (b) = 97 cm

Height (h) = 43 cm

Formula Used:

Area of Parallelogram = Base × Height

Calculations:

=> Area = 97 × 43

=> Area = 4171 cm²

Therefore The correct answer is 4171 cm².

Additional Information

Properties of a Parallelogram

Opposite sides are equal and parallel. Opposite angles are equal, and diagonals bisect each other.

Perimeter of a Parallelogram

Perimeter = 2 × (sum of adjacent sides) = 2(a + b).

Area using Sides and Angle

Area = a × b × sin(θ), where a and b are adjacent sides and θ is the angle between them.

Q85. Answer: (a) PI - KJ

The logic followed here is:

Option (1) 'PI - KJ':

Here, it doesn't follow the pattern.

Option (2) 'KO - LP':

Option (3) 'NR - OS':

Option (4) 'QU - RV':

Hence, the correct answer is "Option 1".

Q86. Answer: (c) 164

Shortcut Trick

Use the direct identity: $a^3 + b^3 + c^3 = (a + b + c)[(a + b + c)^2 − 3(ab + bc + ca)] + 3abc$

Given $(a + b + c) = 5$, $(ab + bc + ca) = −2$, and $abc = 3$.

=> $a^3 + b^3 + c^3 = 5 × [5^2 − 3(−2)] + 3(3)$

=> $a^3 + b^3 + c^3 = 5 × [25 + 6] + 9 = 5 × 31 + 9 = 155 + 9 = 164$

Therefore The correct answer is 164.

Alternate Method

Given: $a + b + c = 5$, $ab + bc + ca = −2$, and $abc = 3$.

Using the identity for square of a trinomial:

=> $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

=> $5^2 = a^2 + b^2 + c^2 + 2(−2)$

=> $25 = a^2 + b^2 + c^2 − 4$

=> $a^2 + b^2 + c^2 = 29$

Now, substitute values into the cubic identity:

=> $a^3 + b^3 + c^3 − 3abc = (a + b + c)(a^2 + b^2 + c^2 − (ab + bc + ca))$

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=> $a^3 + b^3 + c^3 - 3(3) = 5 \times [29 - (-2)]$

=> $a^3 + b^3 + c^3 - 9 = 5 \times (29 + 2)$

=> $a^3 + b^3 + c^3 - 9 = 5 \times 31$

=> $a^3 + b^3 + c^3 = 155 + 9 = 164$

Therefore The correct answer is 164.

Additional Information

Sum of Cubes Special Case

If the sum of three numbers is zero ($a + b + c = 0$), then the sum of their cubes is equal to three times their product: $a^3 + b^3 + c^3 = 3abc$.

Algebraic Identity Extension

$a^2 + b^2 + c^2 - ab - bc - ca = 1/2 [(a-b)^2 + (b-c)^2 + (c-a)^2]$. This is always non-negative for real numbers a, b, and c.

Product of Two at a Time

The expression $(ab + bc + ca)$ is often called the elementary symmetric polynomial of degree 2.

Q87. Answer: (a) Keyboard

The correct answer is Keyboard.

Key Points

• A keyboard is a primary input device used to interact with a computer by typing text, numbers, and executing commands.

• Keyboards are designed with alphanumeric keys (letters and numbers), function keys, navigation keys, and special characters.

• Modern keyboards include additional features such as shortcut keys for multimedia control and programmable keys for custom tasks.

• Keyboards can be wired (using USB or PS/2 connections) or wireless (using Bluetooth or RF technology).

• Various types of keyboards include standard QWERTY keyboards, ergonomic keyboards, and compact keyboards, catering to different user needs.

Additional Information

• Input Devices:

• Input devices are hardware components used to send data or instructions to a computer system.

• Examples include keyboard, mouse, scanner, joystick, microphone, and webcam.

• These devices allow users to interact with and control computer systems efficiently.

• Output Devices:

• These devices receive data from a computer and convert it into a human-readable form, such as visuals or sound.

• Examples include monitors, printers, speakers, and projectors.

• Human-Computer Interaction (HCI):

• HCI refers to the study of how users interact with computer systems and devices.

• Keyboards play a vital role in HCI, allowing users to input commands and data seamlessly.

• Ergonomics of Keyboards:

• Ergonomic keyboards are designed to reduce strain on hands and wrists during prolonged usage.

• These keyboards help prevent repetitive strain injuries, such as carpal tunnel syndrome.

Q88. Answer: (d) Inner Himalayas

The correct answer is Inner Himalayas.

Key Points

• The Inner Himalayas, also referred to as the Great Himalayan Range, are the highest mountain range in the Himalayas.

• This range contains some of the world's tallest peaks, including Mount Everest (8,849m), Kanchenjunga (8,586m), and Nanga Parbat (8,126m).

• The Great Himalayan range serves as a natural boundary between the Indian subcontinent and the Tibetan Plateau.

• It spans across five countries: India, Nepal, Bhutan, China, and Pakistan, making it a significant geographical feature of South Asia.

• It is characterized by perpetual snow cover, glaciers, and alpine vegetation, contributing to its ecological and hydrological significance.

Additional Information

• Shiwalik Range

• The Shiwalik Range, also known as the Outer Himalayas, is the lowest and southernmost range of the Himalayas.

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• It is composed of unconsolidated sediments like sandstone and conglomerates, making it prone to erosion.

• The elevation of the Shiwalik Range typically varies from 600 to 1,200 meters above sea level.

• It forms a transition zone between the plains and the Himalayas.

• Central Axial Range

• This term is not commonly used to describe the Great Himalayan range but may refer to the central spine of the Himalayan region.

• It generally includes peaks from the Inner Himalayas like Everest and Kanchenjunga.

• Northeastern Hills

• The Northeastern Hills are a distinct geographical region in India, located in the northeastern states such as Arunachal Pradesh, Nagaland, and Meghalaya.

• They are not part of the Great Himalayan Range but are a separate geological formation.

• Ecological Importance of the Inner Himalayas

• The Inner Himalayas act as a source of perennial rivers such as the Ganges, Indus, and Brahmaputra, vital for agriculture and human settlements.

• The range supports a variety of flora and fauna, including endangered species like the snow leopard and red panda.

• It plays a crucial role in regulating climate and maintaining biodiversity in the region.

Q89. Answer: (b) 3

Shortcut Trick

For a number to be divisible by 9, the sum of its digits must be divisible by 9.

Sum of digits of 31425p99 = 3 + 1 + 4 + 2 + 5 + p + 9 + 9 = 33 + p.

The nearest multiple of 9 greater than or equal to 33 is 36.

=> 33 + p = 36 → p = 3.

Therefore The correct answer is 3.

Alternate Method

Given: The eight-digit number is 31425p99 and it is divisible by 9.

Formula Used: Divisibility rule of 9 states that the sum of all digits of the number must be a multiple of 9.

Calculations:

=> Sum of digits = 3 + 1 + 4 + 2 + 5 + p + 9 + 9

=> Sum of digits = 33 + p

=> For the number to be divisible by 9, (33 + p) must be a multiple of 9.

=> Since p is a single-digit integer (0 ≤ p ≤ 9), the only possible value for (33 + p) to be divisible by 9 is 36.

=> 33 + p = 36

=> p = 36 − 33

=> p = 3

Therefore The correct answer is 3.

Additional Information

Divisibility Rule of 3

A number is completely divisible by 3 if the sum of its digits is a multiple of 3.

Divisibility Rule of 9

A number is divisible by 9 if and only if the sum of its individual digits is divisible by 9.

Single Digit Range

In any placeholder digit problems, the unknown digit variable p must satisfy the condition 0 ≤ p ≤ 9.

Q90. Answer: (b) 23.5 million

The correct answer is 23.5 million.

Key Points

• According to NITI Aayog's 2022 policy brief, titled 'India's Booming Gig and Platform Economy,' the gig workforce in India is projected to reach 23.5 million by 2029-30.

• As of 2020-21, the gig workforce in India was estimated at about 7.7 million, indicating a significant growth trajectory in the coming years.

• The report highlights that gig workers currently constitute approximately 1.5% of India's total workforce, with this share expected to rise to 4.1% by 2029-30.

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• The gig economy includes workers engaged in short-term, flexible, and freelance work arrangements, often facilitated by digital platforms.

• The projected growth in the gig workforce is attributed to increasing digitalization, urbanization, and demand for flexible work arrangements across sectors.

Additional Information

• Gig Economy:

• The gig economy refers to a labor market characterized by the prevalence of short-term contracts or freelance work as opposed to permanent jobs.

• Examples include ride-sharing drivers (e.g., Uber, Ola), food delivery workers (e.g., Swiggy, Zomato), and freelance professionals in areas such as IT and creative industries.

• Platform Economy:

• The platform economy is driven by digital platforms that connect service providers with consumers, such as e-commerce platforms, ride-hailing apps, and freelance marketplaces.

• It plays a pivotal role in enabling the gig economy by facilitating access to work opportunities.

• NITI Aayog's Recommendations:

• The report emphasizes the need for social security measures for gig workers, including health insurance, skill development, and worker protections.

• It also advocates for the formalization of gig work through regulatory frameworks to ensure fair labor practices.

• Key Sectors in the Gig Economy:

• Prominent sectors include transportation, logistics, e-commerce, healthcare, and personal services.

• The demand for gig workers is expected to grow across both urban and rural areas, with a focus on last-mile delivery and service accessibility.

• Challenges Faced by Gig Workers:

• Gig workers often face income instability, lack of social security benefits, and limited career progression opportunities.

• Addressing these issues through policy interventions is crucial for sustaining the growth of the gig economy.

Q91. Answer: (a) Tappa

The correct answer is Tappa.

Key Points

• Tappa is a semi-classical style of Hindustani music that originated from the folk songs sung by camel riders in North-West India, particularly in Punjab.

• The word "Tappa" means "jump" or "leap," reflecting the fast, intricate, and rhythmic nature of this music style.

• Tappa is characterized by its highly ornamented and rapid musical phrases known as "taan" and "gamak."

• The style was popularized by Ghulam Nabi Shori, also known as "Shori Miyan," during the 18th century in the court of Nawab Asaf-ud-Daula of Awadh.

• Tappa compositions often express themes of love and longing and are performed in languages such as Punjabi and Urdu.

Additional Information

• Hindustani Classical Music:

• Hindustani classical music is one of the two main traditions of Indian classical music, the other being Carnatic music.

• It originated in North India and is based on the system of "ragas" (melodic framework) and "taals" (rhythmic cycles).

• It incorporates elements of Persian and Mughal influences along with indigenous Indian traditions.

• Other Hindustani Styles:

• Dhrupad: The oldest style of Hindustani vocal music, characterized by its solemn and meditative nature.

• Thumri: A romantic and lyrical form of semi-classical music often associated with themes of love and devotion.

• Khayal: A more modern and improvisational style of Hindustani classical music that emphasizes creativity and emotional expression.

• Gamak and Taan:

• Gamak: Ornamentation in Indian classical music that involves oscillating or shaking notes.

• Taan: Fast, intricate melodic patterns that showcase the performer's virtuosity.

• Regional Influence:

• Tappa's roots lie in the folk traditions of camel riders from Punjab and North-West India.

• Its lyrics are often in regional languages, making it accessible and relatable to local audiences.

Q92. Answer: (d) Rs. 3,341

Shortcut Trick

Total Salary is always 100%.

Expenditure % = 100% − Savings % = 100% − 35% = 65%.

Expenditure = 65% of Rs. 5,140 = 0.65 × 5140 = Rs. 3,341.

Therefore The correct answer is Rs. 3,341.

Alternate Method

Given:

Monthly Salary = Rs. 5,140

Savings Percentage = 35%

Formula Used:

Expenditure = Salary − Savings

Calculations:

=> Savings amount = 35% of 5,140

=> Savings amount = (35 ÷ 100) × 5140 = 0.35 × 5140 = Rs. 1,799

=> Expenditure = 5140 − 1799

=> Expenditure = Rs. 3,341

Therefore The correct answer is Rs. 3,341.

Additional Information

Percentage Change

To find a percentage of a number, use: (Percentage ÷ 100) × Total Value.

Complementary Percentages

If an entity is divided into two parts (like savings and expenditure), their percentages always sum up to 100%.

Q93. Answer: (d) 108°

Shortcut Trick

Sum of ratios = 2 + 4 + 4 = 10 units.

10 units = 180° => 1 unit = 18°.

In congruent triangles ΔABC ~= ΔXYZ, corresponding angles are equal: angle X = angle A and angle Z = angle C.

Therefore angle X + angle Z = angle A + angle C = (2 + 4) units = 6 units.

6 units = 6 × 18° = 108°.

Therefore The correct answer is 108°.

Alternate Method

Given: angle A : angle B : angle C = 2 : 4 : 4 and ΔABC ~= ΔXYZ.

Formula Used: Sum of angles in a triangle = 180°.

A

B

C

X

Y

Z

36°

72°

72°

36°

Q94. Answer: (a) It aids digestion and prevents constipation.

The correct answer is It aids digestion and prevents constipation..

Key Points

• Roughage, also known as dietary fiber, is essential for maintaining healthy bowel movements by adding bulk to stool and preventing constipation.

• It promotes the growth of healthy gut bacteria, which aids digestion and supports overall gut health.

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• Roughage helps in regulating blood sugar levels by slowing down the absorption of glucose in the bloodstream.

• Including adequate fiber in the diet reduces the risk of digestive disorders, such as irritable bowel syndrome (IBS).

• A diet rich in roughage also contributes to long-term heart health by lowering cholesterol levels.

Additional Information

• Types of Dietary Fiber:

• Soluble fiber: Dissolves in water and forms a gel-like substance, helping to lower cholesterol and glucose levels. Found in oats, fruits, and legumes.

• Insoluble fiber: Does not dissolve in water and aids in adding bulk to stool, preventing constipation. Found in whole grains, nuts, and vegetables.

• Recommended Intake: The daily recommended intake of dietary fiber is 25 grams for women and 38 grams for men, as per dietary guidelines.

• Health Benefits: Fiber-rich foods help in reducing the risk of chronic diseases such as type 2 diabetes, cardiovascular diseases, and colorectal cancer.

• Sources of Roughage: Common sources include whole grains, fruits, vegetables, nuts, seeds, and legumes.

• Role in Weight Management: Foods high in fiber increase satiety, helping in controlling appetite and supporting weight management.

Q95. Answer: (b) Three

Given: A, B, C, D, E, and W live on six different floors of the same building numbered from 1 (lowest) to 6 (highest).

1) No one lives below D → D lives on Floor 1.

2) Only one person lives between D and A → A must be on Floor 3 (since D is on 1).

3) E lives on some floor above A → E must be on Floor 4, 5, or 6.

4) Only two people live between C and A → C can be on Floor 6 or Floor 1, but Floor 1 is occupied by D, so C must be on Floor 6.

5) Only two people live between E and W → If E is on Floor 5, W can be on 2 or 2 floors below (not possible since 2 is the only option).

6	C
5	E
4	B
3	A
2	W
1	D

Now, how many people live below B (who is on Floor 4)? → A (3), W (2), D (1) → Total = Three people.

Hence, the correct answer is "Option 2".

Q96. Answer: (b) binding to the President

The correct answer is binding to the President.

Key Points

• The Union Cabinet's advice to the President of India is binding under Article 74(1) of the Indian Constitution.

• The President is constitutionally obligated to act in accordance with the advice provided by the Council of Ministers headed by the Prime Minister.

• This principle emphasizes the concept of a parliamentary democracy where the President functions as a nominal head, while real executive power resides with the Council of Ministers.

• The 42nd Amendment Act of 1976 made it explicit that the President "shall act in accordance with such advice."

• Although the President may initially return advice for reconsideration, if the same advice is sent back, the President is bound to accept it.

Additional Information

• Article 74(1): This article states that there shall be a Council of Ministers with the Prime Minister at the head to aid and advise the President, and the President shall act in accordance with such advice.

• 42nd Amendment Act (1976): This amendment explicitly made the President's compliance with the advice of the Council of Ministers mandatory, strengthening the parliamentary system of governance.

• Reconsideration Power: While the President can send a recommendation back to the Council of Ministers for reconsideration, once the advice is reiterated, it becomes binding.

• Nominal vs. Real Executive: The President is the nominal executive head, while the Council of Ministers, led by the Prime Minister, exercises real executive authority.

• Parliamentary Democracy: India follows a parliamentary system of governance where the President acts as the constitutional head, and the Council of Ministers is responsible to the Parliament.

Q97. Answer: (d) 1,013.33

Shortcut Trick

Ratio of books = 51 : 48 = 17 : 16

Assume base price = Rs. 900

Deviation for first part = 1120 − 900 = +220

Net deviation = (17 × 220) ÷ (17 + 16) = 3740 ÷ 33 = 113.33

Average Price = 900 + 113.33 = 1013.33

Therefore The correct answer is Rs. 1013.33.

Alternate Method

Given:

Number of books from first shop (n1) = 51 | Price (x1) = Rs. 1,120

Number of books from second shop (n2) = 48 | Price (x2) = Rs. 900

Formula Used:

Weighted Average Price = (Total Cost) ÷ (Total Number of Books)

Average = (n1x1 + n2x2) ÷ (n1 + n2)

Calculations:

=> Total books = 51 + 48 = 99

=> Total cost = (51 × 1120) + (48 × 900)

=> Total cost = 57120 + 43200 = Rs. 100,320

=> Average Price = 100320 ÷ 99

=> Average Price = 1013.3333...

=> Average Price ≈ Rs. 1013.33

Therefore The correct answer is Rs. 1013.33.

Additional Information

Weighted Average Concept

It is used when different groups have different importance or sizes. Formula: A_w = (w1x1 + w2x2 + ... + w_nx_n) ÷ (w1 + w2 + ... + w_n).

Deviation Method for Averages

Instead of multiplying large numbers, assume an arbitrary mean and find the net deviation divided by total frequency to adjust the assumed mean.

Rounding Off Rules

When rounding to two decimal places, if the third decimal is 5 or more, round up the second decimal; otherwise, keep it the same.

Q98. Answer: (c) 4

Shortcut Trick

Identify the most frequent number in the given data set.

Data: 4, 1, 5, 2, 8, 6, 7, 4, 3, 5, 1, 6, 4, 9, 4

The number 4 appears 4 times, which is the maximum frequency compared to other numbers.

Therefore The correct answer is 4.

Alternate Method

Given: Observations = 4, 1, 5, 2, 8, 6, 7, 4, 3, 5, 1, 6, 4, 9, 4

Formula: Mode is the observation that occurs with the highest frequency in a data set.

1

2

3

4

5

6

7

8

Q99. Answer: (d) ta

The given code language is:

Thus, 'friends' is coded as 'ta'.

Hence, the correct answer is "Option 4".

Q100. Answer: (d) QNI 30

The pattern followed here is.

Thus, the missing term in the series is QNI 30.

Hence, the correct answer is Option 4.

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