RRB NTPC Graduate Level CBT-I Official Paper (Held On: 21 Jun, 2025 Shift 1) (Previous Year Paper)

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

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Q1. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

GUR QEB AOL KYV ?

(a) FUI
(b) UFI
(c) FIU
(d) UIF

Q2. 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 :: ?

: PZL :: AKW : %

(a) = HRD, % = LSE
(b) = HRD, % = ISE
(c) = HRD, % = ISO
(d) = URD, % = ISE

Q3. As per the NITI Aayog Report titled 'FAST TRACKING FREIGHT IN INDIA' of 2021, what was the share of road transport in the freight traffic?

(a) 50%
(b) 71%
(c) 82%
(d) 40%

Q4. Which of the following statements regarding the Theatre Level Operational Readiness Exercise (TROPEX-25) are correct?

1. TROPEX-25 is an annual exercise involving multiple Indian forces.
2. The exercise is being conducted in the Indian Ocean Region over a duration of three months.
3. The exercise includes participation from the Indian Army, Indian Air Force, and Indian Coast Guard.
4. The exercise focuses solely on cyber and electronic warfare operations.

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

Q5. The present cost of a hospital is Rs. 1,82,590. After a year, its cost increased to Rs. 1,95,382. The percentage increase (rounded off to the nearest integer) in the cost of the hospital is:

(a) 3%
(b) 5%
(c) 16%
(d) 7%

Q6. Who is responsible for preparing the inaugural speech of the President of India in Indian Parliament?

(a) The Council of Ministers
(b) Lok Sabha Speaker
(c) The President personally
(d) The Leader of the Opposition

Q7. What was the name of India's humanitarian mission to provide assistance to Myanmar after the earthquake in March 2025?

(a) Operation Dost
(b) Operation Rahat
(c) Operation Maitri
(d) Operation Brahma

Q8. In a certain code language, ‘CARD’ is coded as ‘4681’ and ‘DOGS’ is coded as ‘3219’. What is the code for ‘D’ in the given code language?

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

Q9. Which of the following pairs of reform organisations and their founders is correctly matched?

(a) Brahmo Samaj - Dayanand Saraswati
(b) Bahujan Samaj - BR Ambedkar
(c) Satya Shodhak Samaj - Jyotiba Phule
(d) Arya Samaj - Raja Ram Mohan Roy

Q10. The percentage profit earned by selling a table lamp for Rs. 214 is equal to the percentage loss incurred by selling the same table lamp for Rs. 146. At what price (in Rs.) should the table lamp be sold to make 55% profit?

(a) 276
(b) 279
(c) 282
(d) 278

Q11. MJGT is related to QNKX in a certain way based on the English alphabetical order. In the same way, CZWJ is related to GDAN. To which of the following options is OLIV related, following the same logic?

(a) SMZP
(b) SPZM
(c) SMPZ
(d) SPMZ

Q12. Which country is developing the 'Gelephu Mindfulness City' to promote economic growth, wellness, and sustainability?

(a) Cambodia
(b) Bhutan
(c) Nepal
(d) Sri Lanka

Q13. At what rate (in percentage) per annum will Rs. 1,300 give Rs. 650 as simple interest in 10 years?

(a) 5%
(b) 7%
(c) 8%
(d) 4%

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Q14. Which of the following operating systems provides the highest level of user control over system resources and is most commonly used for professional software development on desktops and laptops?

(a) Windows 11
(b) macOS
(c) Linux (Ubuntu or Fedora)
(d) chromeOS

Q15. Where was the Leadership Summit 2024, a two-day corporate-academia event centered around the theme "Grooming Young Talents" held?

(a) Indian Institute of Technology Roorkee
(b) Indian Institute of Technology Guwahati
(c) Indian Institute of Technology Kanpur
(d) Indian Institute of Technology Mumbai

Q16. Consider the statements with respect to the National Technical Textiles Mission in India.

1. The Union Government has launched a mission named National Technical Textiles Mission in 2025.
2. Technical textiles are fabrics made for specific functions and performance, rather than for looks.
3. They are used in products that help protect people, improve machinery and solve problems in industries, such as in car parts, building materials, medical equipment and safety gear.

Which of the given statements is/are correct?

(a) 1, 2 and 3
(b) Only1 and 2
(c) Only 2 and 3
(d) Only 2

Q17. If $5x + 4y = 12$ and $xy = 2$, then find the value of $125x^3 + 64y^3$.

(a) 268
(b) 258
(c) 288
(d) 286

Q18. Which of the following numbers is divisible by 7?

(a) 1454
(b) 2436
(c) 3344
(d) 3366

Q19. In a certain code language, 'BACK' is coded as '5314' and 'CARB' is coded as '1524'. What is the code for 'R' in the given code language?

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

Q20. What is the mode of the data given below? [Give your answer correct to 2 decimal places.]

Age in years	15-25	25-35	35-45	45-55	55-65	65-75	75-85
No. of patients	14	32	39	38	10	36	22

(a) 43.75
(b) 36.08
(c) 40.86
(d) 60.47

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Q21. In March 2025, Prime Minister Narendra Modi inaugurated 'Vantara' in Jamnagar, Gujarat. What is the primary purpose of this facility?

(a) To act as an advanced animal rescue, conservation and rehabilitation centre
(b) To serve as a luxury wildlife safari resort
(c) To operate as an agricultural research institute for agricultural development
(d) To function as a commercial zoo for tourism

Q22. 18 chairs and 4 tables cost Rs. 7,100 and 18 chairs and 7 tables cost Rs. 7,700. What is the cost of 18 chairs and 5 tables?

(a) Rs. 7300
(b) Rs. 7298
(c) Rs. 7296
(d) Rs. 7295

Q23. A group of numbers and symbols is coded using letter codes as per the codes given below and the conditions that follow. Study the given codes and conditions and answer the question that follows.

Note: If none of the conditions apply, then codes for the respective number/symbol are to be followed directly as given in the table.

Number/symbol	**4**	**#**	**$**	**7**	**9**	**2**	**6**	**@**	**3**	**&**	**5**	**•**
code	B	W	Q	C	A	T	J	N	P	D	G	E

Conditions:

(i) If the first element is a number and the last element is a symbol, then the codes for the first and last elements are to be interchanged.

(ii) If the first element is divisible by 2 and the last element is divisible by 3, then the first and last elements are to be coded as *

(iii) If the first element is a symbol and the last element is an even number, then their codes (i.e. first and last element) are to be changed to the code for 3.

Identify the code for the following.

56#4+

(a) EJWBG
(b) GJWBG
(c) GJWBE
(d) EJGBE

Q24. Which positive number should replace both question marks in the follow?

(?)/11=275/(?)

(a) 46
(b) 54
(c) 55
(d) 59

Q25. SUZD is related to ZBGK in a certain way based on the English alphabetical order. In the same way, UWBF is related to BDIM. To which of the following options is PRWA related, following the same logic?

(a) WYHD
(b) WYDH
(c) WDUH
(d) WDHY

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Q26. In November 2024, who was named Indian Film Personality of the Year at the International Film Festival of India (IFFI)

(a) Ayushmann Khurrana
(b) Vikrant Massey
(c) Manoj Bajpayee
(d) Nawazuddin Siddiqui

Q27. Where is the audit report of an apex co-operative society required to be presented?

(a) State Legislature
(b) State Secretariat
(c) District Office
(d) High Court

Q28. 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) RV-TB
(b) EI-GO
(c) GK-JQ
(d) MQ-OW

Q29. An astronomical observation site, Jantar Mantar, which is also a UNESCO World Heritage Site, is located in which State?

(a) Rajasthan
(b) Madhya Pradesh
(c) Gujarat
(d) Bihar

Q30. What should come in place of the question mark (?) in the given series?

356, 333, 300, ?, 204, 141

(a) 257
(b) 237
(c) 227
(d) 247

Q31. What is the median of the following data?

75, 69, 45, 17, 22, 57, 79, 28, 18, 91, 32

(a) 46
(b) 44.5
(c) 34.5
(d) 45

Q32. Two quadratic equations, $x^2 - 5x + 6 = 0$ and $2x^2 - kx + 6 = 0$, have one common root. What is the possible value of k?

(a) 5
(b) 11
(c) 7
(d) 9

Q33. 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) GK - JN
(b) ML - KJ
(c) EI - HL

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(d) LP - OS

Q34. A, B, L, M, S, T and Z are sitting around a circular table facing the centre. Only four people sit between M and T when counted from the right of M. M sits third to the left of L. S sits third to the left of Z. B is an immediate neighbour of both T and L. How many people sit between A and B when counted from the right of A?

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

Q35. A pouch contains 50 Paise, 25 Paise, and 10 Paise coins in the ratio 18 : 12 : 10, amounting to Rs. 130. Find the number of 10 Paise coins.

(a) 184
(b) 149
(c) 100
(d) 180

Q36. This question is based on the five, three-digit numbers given below.

(Left) 917 782 549 557 539 (Right)

(Example: 697 First digit = 6, Second digit = 9 and third digit = 7) (NOTE: All operations to be done from left to right.)

What will be the result of the first digit of the highest number is added to the second digit of the lowest number?

(a) 12
(b) 13
(c) 11
(d) 15

Q37. Mr. IJK starts from Point A and drives 23 km towards the south. He then takes a right turn, drives 3 km, turns right and drives 27 km. He then takes a right turn and drives 7 km. He takes a final right turn, drives 4 km and stops at Point P. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified)

(a) 4 km in the west
(b) 3 km to the south
(c) 2 km to the east
(d) 1 km to the north

Q38. Which of the following options in PowerPoint allows you to see all the slides at once as thumbnails?

(a) Outline View
(b) Reading View
(c) Slide Show View
(d) Slide Sorter View

Q39. If 1 is added to each even digit and 2 is subtracted from each odd digit in the number 72384596, how many digits will appear more than once in the new number thus formed?

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

Q40. This question is based on the five, three-digit numbers given below.

(Left) 411 559 916 247 769 (Right)

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

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

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

(a) 5
(b) 7

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(c) 11
(d) 9

Q41. Find the value of $((3+3\tan^2A)\cot A)/(1+\cot^2A)\sec A)$.
(a) tanA
(b) sinA
(c) 3sinA
(d) 3tanA

Q42. Evaluate: 86 × 104
(a) 9044
(b) 8954
(c) 8934
(d) 8944

Q43. A and B complete a work in 20 days. If A alone can do it in 45 days, then B alone can do one-third of the same work in _____ days.
(a) 36
(b) 12
(c) 24
(d) 48

Q44. The average of 10 observations is 40. It was realised later that an observation was misread as 31 in place of 50. Find the correct average.
(a) 40.9
(b) 41.9
(c) 42.9
(d) 44.9

Q45. Which of the following methods is the quickest way to open an existing MS PowerPoint presentation?
(a) Use the Alt+F4 shortcut
(b) Double-click the .pptx file in File Explorer
(c) Open MS PowerPoint and click Blank Presentation
(d) Press Ctrl + O

Q46. 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 :: ?
: XFL :: KSY : %
(a) # = SAG, % = PXO
(b) # = SAG, % = PXD
(c) = SAG, % = PID
(d) = TAG, % = PXD

Q47. If 48, 96, 20 and y are in proportion, then the value of y is:
(a) 37
(b) 34
(c) 38
(d) 40

Q48. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?
JCH34 KDI43 LEJ52 MFK61 ?
(a) NGL70
(b) NGK70
(c) NGL71

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(d) NGK71

Q49. Which of the following countries is closest to the Nicobar Islands?

(a) Malaysia
(b) China
(c) Myanmar
(d) Sri Lanka

Q50. What was the main change introduced by the 2015 Amendment to the Citizenship Act?

(a) Merged PIO and OCI card schemes
(b) Abolished Overseas Citizenship
(c) Introduced Dual Citizenship
(d) Created a new visa category for tourists

Q51. Which of the following statements is correct with reference to the representative elements?

(a) They only include p-block elements
(b) They consist of both s- and p-block elements
(c) They contain only metals.
(d) They are also called Transuranium elements.

Q52. How can we change the margins of a document in MS Word?

(a) Design tab -> Margins
(b) Layout tab -> Margins
(c) Review tab -> Margins
(d) Insert tab -> Margins

Q53. If 'A' stands for '÷', 'B' stands for 'x', 'C' stands for '+' and 'D' stands for '-', then what will come in place of the question mark (?) in the following equation?

89 D 7 B 5 C (78 A 6) C 22 = ?

(a) 105
(b) 74
(c) 89
(d) 97

Q54. If 2 is added to each even digit and 1 is subtracted from each odd digit in the number 4123957, what will be the difference between the greatest and smallest digits in the new number thus formed?

(a) 8
(b) 6
(c) 4
(d) 2

Q55. Which of the following was the theme of National Science Day 2025, celebrated on the 28th of February?

(a) Fostering Scientific Excellence through Youth-Driven Research and Innovation in India
(b) Empowering Indian Youth for Global Leadership in Science and Innovation for India's Bright Future
(c) Advancing Scientific Vision through Innovation and Collaborative Growth in Bharat
(d) Building a Developed Nation through Scientific Thinking and Modern Technology

Q56. Each of P, Q, R, S, T, U and V has an exam on a different day of a week, starting from Monday and ending on Sunday of the same week. T has an exam on Thursday. U has an exam immediately before T and P has an exam immediately after T. Only 3 people have exams between Q and V. R has an exam immediately after V. How many people have exams before Q?

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

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Q57. What is the estimated monthly per capita household consumption expenditure in rural India, as reported by Household Consumption Expenditure Survey: 2023-24?

(a) Rs. 5,000
(b) Rs. 3,125
(c) Rs. 9,996
(d) Rs. 4,122

Q58. Seven friends, A, B, C, D, E, F and O, are sitting in a row facing north. Only two people sit to the left of F. Only three people sit between F and A. Only one person sits between A and O. D sits to the immediate left of C. E is not an immediate neighbour of A. How many people sit to the right of B?

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

Q59. The term 'judicial service' under Articles 233-237 refers to:

(a) All magistrates, including executive magistrates
(b) Only district judges
(c) District judges and civil judicial posts below them
(d) Only session judges and additional session judges

Q60. ABCD is a quadrilateral in which AB || DC, and E and F are the mid points of the diagonals AC and BD, respectively. If AB = 30 cm, BC = 20 cm, DC = 86 cm and AD = 84 cm, then what is the length (in cm) of EF?

(a) 28
(b) 31
(c) 23
(d) 24

Q61. The curved surface area of a cone is 2970 cm^2, and its diameter is 70 cm. What is its total surface area (in cm^2)? Use $\pi = 22/7$

(a) 6820
(b) 6825
(c) 6813
(d) 6827

Q62. What does the horizontal row in the periodic table represent?

(a) Columns
(b) Periods
(c) Groups
(d) Blocks

Q63. Each of the digits in the number 31879452 is arranged in the ascending order from left to right. Which of the following digits will be third from the left in the new number thus formed?

(a) 4
(b) 3
(c) 2
(d) 7

Q64. Which summit is scheduled to be held at the Jio World Convention Centre, Mumbai, in May 2025?

(a) World Audio Visual & Entertainment Summit
(b) World Tech India Summit
(c) World Global Business Forum
(d) World Media India Expo

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Q65. The Ghadar Party, established in 1913 in San Francisco, aimed to overthrow the British rule in India through revolutionary means. Who was the key founder and ideological leader of the Ghadar Party?

(a) Lala Har Dayal
(b) VD Savarkar
(c) Sachindra Nath Sanyal
(d) Lala Lajpat Rai

Q66. When did Expo 2025 Osaka officially open?

(a) 13 April 2025
(b) 15 May 2025
(c) 1 March 2025
(d) 10 June 2025

Q67. Who won the women's singles title at the Indian Open 2025 Professional Squash Association (PSA) Copper event?

(a) Rachael Grinham
(b) Anahat Singh
(c) Joshna Chinappa
(d) Dipika Pallikal

Q68. Three water pipes m, n and p, take 5, 6 and 12 hours, respectively, to fill a water tank. If all three pipes are opened at the same time, then the required time to fill the water tank will be:

(a) 22/7 hours
(b) 11/9 hours
(c) 21/9 hours
(d) 2 2/9 hours

Q69. The concept of a mixed economy was central to India's early planning strategies. In the context of India's Five-Year Plans, what does the term 'mixed economy' refer to?

(a) Balanced growth of rural and urban areas
(b) Coexistence of public and private sectors
(c) Coexistence of agriculture and industry
(d) Mix of socialism and communism

Q70. 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 terraces are lawns.

All lawns are grounds.

No ground is a field.

Conclusions:

(I) No terrace is a field.

(II) Some grounds are terraces.

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

Q71. The average of fifty numbers is 34. If two numbers, namely 34 and 22 are discarded, the average of the remaining numbers is:

(a) 32.25
(b) 34.25
(c) 35.25
(d) 31.25

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Q72. In finding the HCF of two numbers by division method, the quotients are 1, 5, and 8, respectively, and the last divisor is 57. What is the LCM of the two numbers?

(a) 114517
(b) 114513
(c) 115400
(d) 114511

Q73. Which type of muscle fibres are primarily found in the gastrointestinal tract, and what is a key characteristic of their contraction?

(a) Skeletal muscle fibres, rapid and voluntary contraction
(b) Cardiac muscle fibres, rhythmic and involuntary contraction
(c) Striated muscle fibres, intermittent and forceful contraction
(d) Smooth muscle fibres, slow and sustained involuntary contraction

Q74. The curved surface area of a right circular cone is 2684π cm², and the diameter of its base is 44 cm. Find the height (in cm) of the cone.

(a) 120
(b) 124
(c) 121
(d) 123

Q75. what was the size of the special economic and comprehensive package launched by the central government to fight COVID-19 pandemic in India

(a) Rs. 20 lakh crore
(b) Rs. 120 lakh crore
(c) Rs. 2 lakh crore
(d) Rs. 200 lakh crore

Q76. The Thar Desert is classified as which of the following?

(a) Polar Desert
(b) Subtropical Desert
(c) Mediterranean Desert
(d) Tundra Desert

Q77. What should come in place of the question mark (?) in the given series?

982 980 988 986 994 992 ?

(a) 1000
(b) 996
(c) 998
(d) 1002

Q78. A dealer purchased an oven for Rs. 605. After allowing a discount of 45% on his marked price, he still gains 37%. Find the marked price of the oven.

(a) Rs. 1,421
(b) Rs. 1,537
(c) Rs. 1,502
(d) Rs. 1,507

Q79. A sells a printer to B at a loss of 60% and B sells the printer to C at a profit of 25%. If C purchased the printer for Rs. 89,569 then what was the cost (in Rs.) of the printer for A?

(a) 179,141
(b) 179,140
(c) 179,138
(d) 179,134

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Q80. 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 5 & 3 * $ 4 @ % 2 7 # 9 ^ # ? 6 8 (Right)

If all the symbols are dropped from the series, which of the following will be fourth from the right?

(a) 7
(b) 2
(c) 4
(d) 9

Q81. "Purvang" and "Uttarang" are two sections of which of the components of Carnatic Music?

(a) Varnam
(b) Charanam
(c) Ragamalika
(d) Anu-Pallavi

Q82. In covering a distance of 162 km, Abhay takes 6 hours more than Sameer. If Abhay doubles his speed, then he would take 3 hours less than Sameer. Abhay's initial speed is:

(a) 8 km/hr
(b) 4 km/hr
(c) 9 km/hr
(d) 18 km/hr

Q83. The Indus Valley Civilization flourished around:

(a) 2500-1800 BCE
(b) 900-300 BCE
(c) 1000-500 BCE
(d) 4500-4000 BCE

Q84. In a certain code language,

A + B means ‘A is the son of B’,

A – B means ‘A is the sister of B’,

A x B means ‘A is the wife of B’ and

A ÷ B means ‘A is the father of B’.

Based on the above, how is E related to K if ‘E ÷ F x G + H – K’?

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

Q85. Govind invested some money in a bank at 4% per annum rate of interest. What would be the corresponding simple interest (in Rs.) after 2 years, Govind got Rs. 280.5 as compound interest, assuming annual compounding?

(a) 290
(b) 275
(c) 270
(d) 285

Q86. In February 2025, which bank of India has announced $10 billion three-year dollar/rupee swap auction?

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

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Q87. Taran ranked 28th from the top and 64th from the bottom in his class. How many students are there in his class?

(a) 93
(b) 92
(c) 91
(d) 90

Q88. Amit's salary is Rs. 13,000 per month. He spends Rs. 4,000 on house rent, Rs. 2,000 on bills, and the rest of the amount is his monthly savings. Find his savings (in Rs.) in a year, if in the month of birthday he spent his complete monthly savings for a birthday celebration.

(a) 84,000
(b) 70,000
(c) 85,000
(d) 77,000

Q89. If a + b = 41 and a - b = 38, find the value of $(a+b)^2$.

(a) 1681
(b) 1733
(c) 1763
(d) 1759

Q90. Mr. O starts from Point U and drives 1 km towards the west. He then takes a left turn, drives 2 km, turns right and drives 3 km. He then takes a left turn and drives 4 km. He then takes a left turn, drives 4 km. He takes a final left turn, drives 4 km and stops at Point V. How far (shortest distance) and towards which direction should he drive in order to reach Point U again? (All turns are 90-degree turns only unless specified.)

(a) 1 km towards the east
(b) 1 km towards the south
(c) 2 km towards the west
(d) 2 km towards the north

Q91. Seven boxes, A, B, C, D, E, F and Y, are kept one over the other but not necessarily in the same order. Only D is kept above F. Only three boxes are kept between D and A. Only B is kept below E. Y is not kept immediately above A. How many boxes are kept between C and B?

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

Q92. The Mauryan period saw the development of which script for inscriptions?

(a) Brahmi
(b) Grantha
(c) Kharosthi
(d) Pali

Q93. In ΔABC, DE || AC, where D and E are the points on sides AB and BC, respectively. If BD = 17 cm and AD = 14 cm, then what is the ratio of the area of ΔBDE to that of the trapezium ADEC?

(a) 523:367
(b) 672:289
(c) 289:672
(d) 475:326

Q94. A train P, going at the speed of 30 km/hr completely passes train Q of length 296 m, going in the same direction on parallel tracks, at 21 km/hr, in 6.5 minutes. How much time (in seconds) will P take to cross completely train R of length 196 m, going at 96 km/hr in the opposite direction?

(a) 21
(b) 22
(c) 42

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(d) 25

Q95. Which of the following Indian states shares an international boundary with three countries?

(a) Himachal Pradesh
(b) West Bengal
(c) Bihar
(d) Uttarakhand

Q96. Select the set in which the numbers are related in the same way as 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/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(57, 41, 32)

(65, 49, 40)

(a) (59, 85, 74)
(b) (72, 56, 47)
(c) (96, 80, 61)
(d) (51, 35, 16)

Q97. Which Princely State was ruled personally by the Nizam and had the 'Sarf khas' estate?

(a) Mysore
(b) Hyderabad
(c) Kashmir
(d) Gwalior

Q98. In the context of computer hardware components, what is the primary function of ROM?

(a) It holds essential firmware required for booting the system
(b) It physically supports all internal hardware modules
(c) It stores temporary data used during system processing
(d) It executes programs and handles arithmetic operations.

Q99. When was the designation of the Governor General in India promoted as a Viceroy or Crown's representative?

(a) Year 1857
(b) Year 1935
(c) Year 1833
(d) Year 1858

Q100. Which of the following rivers originates in the Western Ghats?

(a) Ganga
(b) Brahmaputra
(c) Krishna
(d) Yamuna

ANSWER KEY

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

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81	a	82	c	83	a	84	d	85	b	86	a	87	c	88	d	89	a	90	d
91	b	92	a	93	c	94	d	95	b	96	b	97	b	98	a	99	d	100	c

SOLUTIONS

Q1. Answer: (d) UIF

The logic followed here is:

Thus, the missing letter in the series is UIF.

Hence, the correct answer is "Option 4".

Q2. Answer: (b) = HRD, % = ISE

Given:

: PZL :: AKW : %

Option 1) # = HRD, % = LSE

For # (HRD) to PZL

For AKW to % (LSE)

Option 1 is incorrect.

Option 2) # = HRD, % = ISE

For # (HRD) to PZL

For AKW to % (ISE)

Option 2 is correct.

Option 3) # = HRD, % = ISO

For # (HRD) to PZL

For AKW to % (ISO)

Option 3 is incorrect.

Option 4) # = URD, % = ISE

For # (URD) to PZL

For AKW to % (ISE)

Option 4 is incorrect.

Hence, the correct answer is "Option 2".

Q3. Answer: (b) 71%

The correct answer is 0.71.

Key Points

• According to the NITI Aayog report titled 'FAST TRACKING FREIGHT IN INDIA' (2021), the road transport sector accounted for 71% of the freight traffic in India.

• This dominance of road transport is attributed to its flexibility, last-mile connectivity, and the rapid growth of e-commerce and logistics sectors.

• The share of railways in freight transport was significantly lower, emphasizing the need for a modal shift to reduce logistics costs and environmental impact.

• The report highlights the need for improving multi-modal logistics and enhancing the efficiency of rail, waterways, and air transport systems.

• With freight transport demand expected to grow rapidly, road transport's share must be complemented by increased investment in sustainable alternatives.

Additional Information

• Freight Transport in India:

• India's freight transport is dominated by roadways, followed by railways, inland waterways, and air transport.

• Freight traffic demand is expected to grow at a CAGR of 5.9% between 2020 and 2050, as per NITI Aayog estimates.

• Challenges in Road Freight Transport:

• High logistics costs: India's logistics costs are 13-14% of GDP, higher than developed countries' average of 8-10%.

• Environmental concerns: Road transport contributes significantly to greenhouse gas emissions and air pollution.

• Infrastructure bottlenecks: Lack of proper road infrastructure and congestion affect transport efficiency.

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• Proposed Solutions:
• Shifting freight to rail and waterways to reduce costs and environmental impact.
• Development of multi-modal logistics parks to enhance connectivity and reduce transit times.
• Use of technology for efficient freight tracking and reduced delays.
• Government Initiatives:
• The Bharatmala Pariyojana aims to improve road infrastructure and connectivity across the country.
• The Dedicated Freight Corridors (DFCs) project aims to enhance the efficiency and capacity of rail freight transport.
• Promotion of electric and alternative fuel vehicles to reduce the carbon footprint of road transport.

Q4. Answer: (b) 2 and 3 only

The correct answer is option 3,

Key Points

• TROPEX-23 is an annual exercise conducted by the Indian Navy to test its operational readiness across multiple domains.
• The exercise is conducted in the Indian Ocean Region over a duration of three months.
• TROPEX includes participation from the Indian Army, Indian Air Force, and Indian Coast Guard, showcasing integrated force capabilities.
• The exercise aims to evaluate operational strategies, enhance interoperability, and test readiness in conventional and non-conventional domains.
• The focus is on joint operations rather than solely cyber and electronic warfare, making it a comprehensive military drill.

Additional Information

• Indian Ocean Region (IOR)
• The IOR is strategically significant due to its vast maritime trade routes and geopolitical importance.
• India conducts frequent naval exercises in the region to ensure maritime security and freedom of navigation.
• Interoperability
• Interoperability refers to the ability of different military forces to work together seamlessly.
• TROPEX emphasizes joint operations between the Navy, Army, Air Force, and Coast Guard.
• Cyber Warfare
• Cyber warfare involves the use of cyber attacks to disrupt, damage, or destroy adversary systems.
• While TROPEX includes cyber and electronic warfare elements, its scope is broader and includes conventional operations.
• Integrated Military Strategy
• TROPEX is a platform to test India's integrated military strategies and preparedness.
• Such exercises focus on enhancing force projection and defending national interests in maritime regions.

Q5. Answer: (d) 7%

Shortcut Trick

Cost increase = 1,95,382 − 1,82,590 = 12,792

Percentage increase = (12,792 ÷ 1,82,590) × 100

Approximate 1% of 1,82,590 ≈ 1,826. Since 1,826 × 7 = 12,782, the value is ≈ 7%.

Therefore The correct answer is 7%.

Alternate Method

Given:

Original Cost = Rs. 1,82,590

New Cost = Rs. 1,95,382

Formula Used:

Percentage Increase = [(New Value − Original Value) ÷ Original Value] × 100

Calculations:

=> Total Increase = 1,95,382 − 1,82,590 = 12,792

=> Percentage Increase = (12,792 ÷ 1,82,590) × 100

=> Percentage Increase ≈ 0.070058 × 100

=> Percentage Increase ≈ 7.0058%

=> Rounded to nearest integer = 7%

Therefore The correct answer is 7%.

Additional Information

Percentage Change

It represents the relationship between an old value and a new value. Formula: [(Difference) ÷ (Original Value)] × 100.

Rounding Off Rules

If the decimal part is 0.5 or more, round up to the next integer; otherwise, keep the current integer.

Base Value in Percentage

Always use the initial or original value as the denominator (base) when calculating the percentage of increase or decrease.

Q6. Answer: (a) The Council of Ministers

The correct answer is option 1,

Key Points

• The inaugural speech of the President of India in Parliament is prepared by The Council of Ministers, which advises the President on the content of the address.

• It is presented at the beginning of the first session of each year or after the formation of a new government.

• The speech outlines the government's policies, priorities, and legislative agenda for the upcoming year.

• This address is a constitutional requirement under Article 87 of the Indian Constitution.

• It serves as a medium for the government to communicate its vision and plans to the Parliament and the nation.

Additional Information

• Article 87 of the Indian Constitution:

• It mandates the President to address both Houses of Parliament at the commencement of the first session each year.

• The speech is designed to inform the legislature about the government's policies and agenda.

• Role of the Council of Ministers:

• The Council of Ministers, headed by the Prime Minister, assists the President in drafting the speech.

• This ensures that the address reflects the collective policy decisions and priorities of the government.

• Importance of the Presidential Address:

• It sets the tone for parliamentary discussions and debates for the upcoming session.

• The address acts as a bridge between the executive branch and the legislative branch of the government.

• Historical Context:

• The tradition of the Presidential Address was inherited from the British parliamentary system.

• It underscores the ceremonial significance of the President's role in India's constitutional framework.

Q7. Answer: (d) Operation Brahma

The correct answer is option 4,Operation Brahma was India's humanitarian mission launched in March 2025 to provide assistance to Myanmar after the earthquake.

The correct answer is Operation Brahma.

Key Points

• Operation Brahma was India's humanitarian mission initiated to provide emergency relief to Myanmar following a devastating earthquake in March 2025.

• The operation aimed to deliver medical aid, food supplies, and search-and-rescue teams to affected regions of Myanmar.

• The mission was coordinated by the National Disaster Management Authority (NDMA) of India in collaboration with Myanmar's government.

• Specialized teams, including the National Disaster Response Force (NDRF), were deployed to assist in rescue operations and provide immediate relief.

• The operation highlighted India's commitment to regional humanitarian assistance and disaster response under its "Neighborhood First" policy.

Additional Information

• National Disaster Response Force (NDRF)

• NDRF is a specialized force under the Ministry of Home Affairs in India, tasked with handling natural and human-made disasters.

• The force is equipped with advanced equipment and trained personnel for disaster management and rescue operations.

• NDRF played a pivotal role during Operation Brahma in Myanmar by conducting rescue missions and delivering relief materials.

• Neighborhood First Policy

• India's foreign policy emphasizes strengthening relations with neighboring countries through cooperation and mutual assistance.

• Under this policy, India provides humanitarian aid and disaster relief to neighboring nations during crises.

• Operation Brahma was a prime example of India's commitment to this policy.

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• Earthquake Disaster Management

• Earthquakes are natural disasters requiring immediate response to minimize casualties and damage.

• Disaster management includes rescue operations, medical support, and rehabilitation for affected populations.

• India's NDMA and NDRF regularly train for earthquake-related disaster response, ensuring readiness for missions like Operation Brahma.

• Humanitarian Assistance Operations

• Humanitarian missions involve providing aid to countries facing natural or man-made disasters.

• Such operations often include delivering food, water, medicine, and shelter to affected populations.

• India has conducted several humanitarian assistance missions, including Operation Brahma, showcasing its leadership in regional disaster response.

Q8. Answer: (d) 1

The given code language is:

Thus, 'D' is coded as '1'.

Hence, the correct answer is "Option 4".

Q9. Answer: (c) Satya Shodhak Samaj - Jyotiba Phule

The correct answer is Satya Shodhak Samaj - Jyotiba Phule.

Key Points

• Satya Shodhak Samaj was founded by Jyotiba Phule in 1873 in Pune, Maharashtra, with the aim of promoting social equality and challenging caste-based discrimination.

• The organization focused on uplifting marginalized sections of society, including lower castes and women, by spreading education and awareness about their rights.

• It opposed the dominance of the Brahminical priesthood and sought to challenge the rigid caste hierarchy prevalent in Indian society at the time.

• Jyotiba Phule and his wife, Savitribai Phule, actively worked to provide education to women and oppressed communities, believing that education was the key to social reform.

• Satya Shodhak Samaj also emphasized self-respect, rational thinking, and the rejection of blind faith and superstitions.

Additional Information

• Brahmo Samaj:

• Founded by Raja Ram Mohan Roy in 1828, it aimed at reforming Hindu society by abolishing practices like Sati and promoting widow remarriage and education for women.

• It advocated monotheism, rational thinking, and a departure from idol worship and rituals.

• Arya Samaj:

• Founded by Dayanand Saraswati in 1875, Arya Samaj emphasized the Vedas as the ultimate source of knowledge and guidance.

• It advocated social reforms such as the abolition of caste discrimination, child marriage, and untouchability.

• Bahujan Samaj:

• This term is generally associated with the Bahujan Samaj Party (BSP), founded by Kanshi Ram in 1984, to represent the Dalits, Adivasis, Other Backward Classes (OBCs), and minority communities.

• BR Ambedkar, a key Dalit leader and social reformer, laid the ideological foundation for movements advocating the rights of marginalized communities.

• Jyotiba Phule's Contributions:

• He was a social reformer, writer, and activist who challenged the caste system and gender inequality in India.

• He authored several important works, including "Gulamgiri" (Slavery), which critiqued the caste system and called for equality.

Q10. Answer: (b) 279

Shortcut Trick

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

CP = (214 + 146) ÷ 2 = 360 ÷ 2 = Rs. 180.

To make 55% profit, required SP = CP × (100 + P%) ÷ 100.

Required SP = 180 × 155 ÷ 100 = 1.8 × 155 = Rs. 279.

Therefore The correct answer is Rs. 279.

Alternate Method

Given: SP1 = Rs. 214, SP2 = Rs. 146, Profit% at SP1 = Loss% at SP2, New Profit% = 55%.

Formulas: Profit = SP − CP | Loss = CP − SP | SP = CP × (1 + P/100).

=> Let the CP be x. Since Profit% = Loss%, (214 − x)/x × 100 = (x − 146)/x × 100.

=> 214 − x = x − 146 => 2x = 360 => x = 180.

=> New Selling Price = 180 × (100 + 55) ÷ 100 = 180 × 1.55.

=> New Selling Price = 180 × 155 / 100 = 27900 / 100 = Rs. 279.

Therefore The correct answer is Rs. 279.

Additional Information

Symmetric Profit and Loss

When numerical profit equals numerical loss for two different prices, CP is the mid-point. If Profit% = Loss%, CP is still the arithmetic mean of the two SPs.

Percentage Calculations

To calculate a value after x% increase: New Value = Original Value × (1 + x/100).

Q11. Answer: (d) SPMZ

The logic followed here is:

CZWJ : GDAN

Applying the logic to OLIV:

Thus, OLIV is related to SPMZ.

Hence, the correct answer is "Option 4".

Q12. Answer: (b) Bhutan

The correct answer is option 2,

Key Points

• Gelephu Mindfulness City is an ambitious urban development project initiated by the Kingdom of Bhutan.

• The project is focused on promoting economic growth, sustainability, and holistic wellness through mindfulness-centric urban planning.

• The city aims to integrate green infrastructure, renewable energy, and eco-friendly practices into its design.

• Located in the Sarpang District, Gelephu serves as a strategic location for Bhutan's development goals due to its proximity to India.

• The initiative aligns with Bhutan's commitment to Gross National Happiness (GNH), which prioritizes well-being over material wealth.

Additional Information

• Gross National Happiness (GNH)

• GNH is Bhutan's unique development philosophy that emphasizes holistic well-being over GDP growth.

• It incorporates four pillars: sustainable development, environmental conservation, cultural preservation, and good governance.

• GNH is a global model for integrating mindfulness and happiness into governance and policy-making.

• Green Infrastructure

• Green infrastructure refers to urban planning that incorporates natural ecosystems to enhance environmental sustainability.

• In Gelephu Mindfulness City, this includes renewable energy systems, eco-friendly buildings, and waste management practices.

• Sustainability in Urban Development

• Sustainable urban development focuses on creating environmentally friendly and socially inclusive cities.

• Projects like Gelephu Mindfulness City aim to reduce carbon footprints and optimize resource efficiency.

• Bhutan-India Relations

• Bhutan shares close cultural, economic, and strategic ties with India.

• Gelephu’s location near India enhances cross-border trade and connectivity, supporting Bhutan's development objectives.

Q13. Answer: (a) 5%

Shortcut Trick

Simple Interest (SI) per year = 650 ÷ 10 = Rs. 65

Rate % = (Interest for 1 year ÷ Principal) × 100

Rate = (65 ÷ 1300) × 100

Rate = 5%

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Therefore The correct answer is 5%.

Alternate Method

Given:

Principal (P) = Rs. 1,300

Simple Interest (SI) = Rs. 650

Time (T) = 10 years

Formula Used:

SI = (P × R × T) ÷ 100

Calculations:

=> 650 = (1300 × R × 10) ÷ 100

=> 650 = (13000 × R) ÷ 100

=> 650 = 130 × R

=> R = 650 ÷ 130

=> R = 5%

Therefore The correct answer is 5%.

Additional Information

Simple Interest Concept

Interest is calculated only on the original principal amount throughout the entire period. SI = P × R × T / 100.

Total Amount Formula

The final sum of money is called the Amount. Amount (A) = Principal (P) + Simple Interest (SI).

Finding Time or Principal

Using the same base formula, Time (T) = (SI × 100) ÷ (P × R) and Principal (P) = (SI × 100) ÷ (R × T).

Q14. Answer: (c) Linux (Ubuntu or Fedora)

The correct answer is option 3,

Key Points

• Linux (Ubuntu, Fedora, etc.) is an open-source operating system known for offering maximum control over system resources, making it highly suitable for professional software development.

• Linux is widely preferred by developers due to its customizability, allowing users to modify the kernel, install specific libraries, and configure the system as per their requirements.

• It supports a vast range of programming languages and tools, including Python, C++, Java, Git, Docker, and more, making it a go-to choice for software development.

• Popular distributions like Ubuntu and Fedora come with pre-installed development tools and have extensive community support for troubleshooting and enhancements.

• Linux's lightweight architecture and security make it ideal for running resource-intensive tasks like compiling large codebases or managing cloud-based projects.

Additional Information

• Open Source Nature

• Linux is open-source, meaning its source code is freely available for modification and distribution, empowering developers to tailor it to their needs.

• This also fosters innovation and collaboration among a global community of developers.

• Package Managers

• Linux distributions use package managers like APT (for Debian/Ubuntu) or DNF (for Fedora) to easily install, update, and manage software packages.

• These tools simplify the process of maintaining a development environment.

• Security Features

• Linux is considered more secure than many other operating systems due to its robust permission structure and active community-driven updates.

• It is less prone to malware and viruses, making it a reliable choice for development environments.

• Server and Cloud Integration

• Linux is extensively used in server environments, and its compatibility with cloud platforms like AWS, Azure, and Google Cloud makes it indispensable for modern software development.

• Many web servers (e.g., Apache, NGINX) and database systems (e.g., MySQL, PostgreSQL) are optimized for Linux.

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Q15. Answer: (b) Indian Institute of Technology Guwahati

The correct answer is Indian Institute of Technology Guwahati.

Key Points

• The Leadership Summit 2024, a two-day corporate-academia event, was held at the Indian Institute of Technology Guwahati (IIT Guwahati).

• The summit revolved around the theme "Grooming Young Talents", emphasizing collaboration between academic institutions and the corporate sector.

• This summit aimed at equipping young professionals and students with the necessary skills to meet modern industry demands.

• IIT Guwahati has been recognized for hosting such events to bridge the gap between academia and industry, fostering innovation and entrepreneurship.

• The event featured keynote speakers, panel discussions, and workshops involving industry leaders, academicians, and policymakers.

Additional Information

• Indian Institute of Technology Guwahati (IIT Guwahati):

• Established in 1994, IIT Guwahati is one of India's premier engineering institutions.

• It is located in North Guwahati, Assam, along the banks of the Brahmaputra River.

• The institute is known for its world-class research facilities and focus on interdisciplinary education.

• Leadership Summit:

• A platform for leaders from various sectors to share insights, innovations, and strategies.

• Such summits facilitate networking opportunities and the exchange of ideas between academia and the corporate world.

• They are instrumental in addressing skill gaps and ensuring employability for young graduates.

• Grooming Young Talents:

• The theme underscores the importance of nurturing the next generation of professionals to meet evolving industry needs.

• Focus areas include skill development, entrepreneurship, and leadership training.

• Events like these aim to align academic curricula with real-world challenges.

• Industry-Academia Collaboration:

• This collaboration ensures the relevance of academic programs to industry requirements.

• It involves internships, joint research projects, and guest lectures by industry experts.

• Such partnerships boost innovation, employability, and knowledge transfer.

Q16. Answer: (c) Only 2 and 3

The correct answer is option 3, Key Points - The National Technical Textiles Mission was launched by the Government of India in February 2020, not 2025, hence statement 1 is incorrect. - Technical textiles are indeed fabrics designed for specific functions and performance rather than aesthetics, making statement 2 correct. - These textiles find applications in various fields such as automotive parts, construction materials, medical devices, and protective gear, confirming statement 3 is correct. - The mission aims to improve India's technical textiles industry through research and innovation, boost exports, and increase domestic usage of technical textiles. - Under this mission, the government has allocated Rs. 1,480 crore for its implementation over four years (2020–2024). Additional Information - Technical Textiles Definition: These are textiles engineered for functional purposes like durability, safety, and efficiency, rather than decorative use. - Applications of Technical Textiles: Includes geotextiles (used in construction), agro-textiles (used in agriculture), medical textiles (used in healthcare), and protective textiles (used in defense). - Global Market: India is a growing hub for technical textiles, contributing significantly to the global market, with a focus on innovation and sustainability. - Objectives of the Mission: Promote the use of technical textiles in high-tech industries, increase exports, and reduce reliance on imports. - Implementation Agencies: The Ministry of Textiles, along with research institutions and industries, is driving the mission forward through collaboration and policy support.

Q17. Answer: (c) 288

Shortcut Trick

Use the algebraic identity: $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$.

Here, let $a = 5x$ and $b = 4y$, then $a + b = 12$ and $ab = 5 \times 4 \times xy = 20 \times 2 = 40$.

Applying the formula: $125x^3 + 64y^3 = (5x + 4y)^3 - 3(5x)(4y)(5x + 4y)$.

Result = $12^3 - 3 \times 40 \times 12 = 1728 - 1440 = 288$.

Therefore The correct answer is 288.

Alternate Method

Given: $5x + 4y = 12$ and $xy = 2$.

Formula Used: $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$

To find the value of $125x^3 + 64y^3$, we cube both sides of the given equation $5x + 4y = 12$:

=> $(5x + 4y)^3 = (12)^3$

=> $(5x)^3 + (4y)^3 + 3 \times (5x) \times (4y) \times (5x + 4y) = 1728$

=> $125x^3 + 64y^3 + 3 \times (20xy) \times (12) = 1728$

=> $125x^3 + 64y^3 + 36 \times 20 \times (2) = 1728$

=> $125x^3 + 64y^3 + 1440 = 1728$

=> $125x^3 + 64y^3 = 1728 - 1440$

=> $125x^3 + 64y^3 = 288$

Therefore The correct answer is 288.

Additional Information

Cubic Sum Identity

$(a + b)^3 = a^3 + b^3 + 3ab(a + b)$. It can also be written as $a^3 + b^3 = (a + b)^3 - 3ab(a + b)$.

Cubic Difference Identity

$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$. This is useful for finding the difference of cubes when the product and difference are known.

Factorization of Cubes

$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$ and $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$.

Q18. Answer: (b) 2436

Shortcut Trick

To check divisibility by 7: Double the last digit and subtract it from the remaining number.

For 2436: $243 - (6 \times 2) = 243 - 12 = 231$.

Repeat: $23 - (1 \times 2) = 21$.

Since 21 is divisible by 7, the number 2436 is divisible by 7.

Therefore The correct answer is 2436.

Alternate Method

Given: Four numbers (1) 1454, (2) 2436, (3) 3344, (4) 3366.

Formula Used: Standard Division Method.

=> Option 1: $1454 \div 7 = 207$, Remainder = 5 (Not divisible)

=> Option 2: $2436 \div 7 = 348$, Remainder = 0 (Divisible)

=> Option 3: $3344 \div 7 = 477$, Remainder = 5 (Not divisible)

=> Option 4: $3366 \div 7 = 480$, Remainder = 6 (Not divisible)

Therefore The correct answer is 2436.

Additional Information

Divisibility Rule of 7 (Osculator Method)

Subtract twice the last digit from the rest of the number. If the result is 0 or a multiple of 7, the original number is divisible by 7.

Divisibility Rule of 11

The difference between the sum of digits at odd places and the sum of digits at even places must be 0 or a multiple of 11.

Divisibility Rule of 13

Add four times the last digit to the remaining number. If the result is divisible by 13, the whole number is divisible by 13.

Q19. Answer: (d) 2

The given code language is:

Thus, 'R' is coded as '2'.

Hence, the correct answer is "Option 4".

Q20. Answer: (a) 43.75

Shortcut Trick

Identify the modal class with the highest frequency: 35−45 (frequency = 39).

Calculate differences: $d1 = 39 - 32 = 7$ and $d2 = 39 - 38 = 1$.

Apply shortcut: Mode = Lower limit + $[d1 \div (d1 + d2)] \times$ Class width.

Mode = $35 + [7 \div (7 + 1)] \times 10 = 35 + 8.75 = 43.75$.

Therefore The correct answer is 43.75.

Alternate Method

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Given: Modal class = 35−45, Lower limit (l) = 35, Frequency (f1) = 39, Preceding frequency (f0) = 32, Succeeding frequency (f2) = 38, Class size (h) = 10.

Formula: Mode = l + [(f1 − f0) ÷ (2f1 − f0 − f2)] × h

=> Mode = 35 + [(39 − 32) ÷ (2 × 39 − 32 − 38)] × 10

=> Mode = 35 + [7 ÷ (78 − 70)] × 10

=> Mode = 35 + [7 ÷ 8] × 10

=> Mode = 35 + 0.875 × 10

=> Mode = 35 + 8.75 = 43.75

&there4

Q21. Answer: (a) To act as an advanced animal rescue, conservation and rehabilitation centre

The correct answer is option 1,"

Key Points

• 'Vantara' is an advanced animal rescue, conservation, and rehabilitation centre inaugurated by PM Narendra Modi in Jamnagar, Gujarat.

• The facility is a dedicated effort to protect and rehabilitate native and endangered wildlife species.

• It focuses on providing advanced care and treatment to animals rescued from illegal trade, injury, or other distressing circumstances.

• The centre is part of the government's initiative to promote environmental conservation and biodiversity preservation.

• Vantara is expected to become a hub for scientific research related to wildlife conservation.

Additional Information

• Wildlife Conservation:

• Wildlife conservation refers to the practice of protecting animal species and their habitats to ensure biodiversity and ecological balance.

• Efforts include rescue centres, breeding programs, habitat restoration, and anti-poaching measures.

• India is home to several endangered species, including the Bengal tiger, Indian elephant, and Asiatic lion.

• Endangered Species:

• Endangered species are those at risk of extinction due to habitat loss, hunting, climate change, or other factors.

• Efforts to protect endangered species include national parks, wildlife sanctuaries, and conservation centres like Vantara.

• Biodiversity in India:

• India is one of the 17 megadiverse countries in the world, housing around 8% of the global species diversity.

• Initiatives such as Project Tiger and Project Elephant aim to protect flagship species and their ecosystems.

• Illegal Wildlife Trade:

• Illegal wildlife trade poses a significant threat to biodiversity, involving species like pangolins, turtles, and exotic birds.

• Rescue centres like Vantara help rehabilitate animals seized from illegal trade operations.

"

Q22. Answer: (a) Rs. 7300

Shortcut Trick

Difference in Tables = 7 − 4 = 3

Difference in Cost = Rs. 7,700 − Rs. 7,100 = Rs. 600

Cost of 1 Table = Rs. 600 ÷ 3 = Rs. 200

Cost of 18 Chairs and 5 Tables = (18 chairs + 4 tables) + 1 table

Total Cost = Rs. 7,100 + Rs. 200 = Rs. 7,300

Therefore The correct answer is Rs. 7300.

Alternate Method

Given:

18 Chairs + 4 Tables = Rs. 7,100 ... (i)

18 Chairs + 7 Tables = Rs. 7,700 ... (ii)

Subtracting equation (i) from equation (ii):

=> (18C + 7T) − (18C + 4T) = 7,700 − 7,100

=> 3T = 600

=> T = 200

To find the cost of 18 Chairs and 5 Tables:

=> Cost = (18C + 4T) + 1T

=> Cost = 7,100 + 200

=> Cost = 7,300

Therefore The correct answer is Rs. 7300.

Additional Information

Linear Equations in Two Variables

Equations of the form ax + by = c where a, b, and c are constants. These are solved using methods like elimination or substitution.

Elimination Method

A process where one variable is removed by adding or subtracting equations, typically after multiplying equations by suitable constants to make the coefficients of that variable equal.

Unitary Method

A basic mathematical concept where we first find the value of a single unit and then multiply it by the required number of units to find the total value.

Q23. Answer: (a) EJWBG

Number/Symbol	**4**	**#**	**$**	**7**	**9**	**2**	**6**	**@**	**3**	**&**	**5**	**•**
Code	B	W	Q	C	A	T	J	N	P	D	G	E

Given: 56#4+

Rule No. (i): This condition applies because the first element (5) is a number and the last element (+) is a symbol. So, the codes for the first and last elements will be interchanged.

Rule No. (ii): This condition does not apply because the first element (5) is not divisible by 2.

Rule No. (iii): This condition does not apply because the first element (5) is not a symbol.

Based on the applicable rule (i), the codes for the first and last elements are interchanged.

The code for 6 is J.

The code for # is W.

The code for 4 is B.

The code for 5 becomes the code for +, which is E.

The code for + becomes the code for 5, which is G.

Thus, '56#4+' is coded as → EJWBG.

Hence, the correct answer is "Option 1".

Q24. Answer: (c) 55

Given:

(?)/11 = 275/(?)

Formula used:

Cross multiplication method: a/b = c/d => a × d = b × c

Calculation:

(?)/11 = 275/(?)

=> ? × ? = 11 × 275

=> $?^2$ = 3025

=> ? = √3025 = 55

Therefore The correct answer is option (3).

Q25. Answer: (b) WYDH

The logic followed here is:

Pair 1: SUZD : ZBGK

Pair 2: UWBF : BDIM

Applying the logic to PRWA:

Thus, PRWA is related to WYDH.

Hence, the correct answer is "Option 2".

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Q26. Answer: (b) Vikrant Massey

The correct answer is Vikrant Massey.

Key Points

• Vikrant Massey was honored as the Indian Film Personality of the Year at the International Film Festival of India (IFFI) in November 2024.

• IFFI is one of the most prestigious film festivals in India, organized annually by the Ministry of Information and Broadcasting.

• The award recognizes an individual's outstanding contribution to Indian cinema over their career.

• Vikrant Massey is widely acclaimed for his versatile acting in films, OTT platforms, and television, showcasing his ability to excel in diverse roles.

• He has earned critical praise for films like "A Death in the Gunj" and "Chhapaak", as well as web series such as "Criminal Justice".

Additional Information

• International Film Festival of India (IFFI):

• IFFI is an annual event held in Goa, established in 1952, and is considered one of Asia's oldest and most prestigious film festivals.

• The festival showcases a diverse range of films, both Indian and international, and serves as a platform for cultural exchange.

• It includes awards such as the Golden Peacock for Best Film and recognition of notable contributors to cinema.

• Indian Film Personality of the Year Award:

• This award is presented annually at IFFI to honor individuals with significant contributions to Indian cinema.

• Recipients of this award are recognized for their impact on Indian cinema and society through their work.

• Vikrant Massey's Career Highlights:

• Vikrant Massey began his career in television before transitioning successfully to films and web series.

• He is known for his relatable characters and nuanced performances across various genres.

• His films and series often focus on socially relevant themes and narratives.

• Recognition of Indian Cinema:

• Indian cinema is one of the largest film industries globally, producing films in multiple languages each year.

• It plays a pivotal role in showcasing Indian culture, stories, and societal issues on international platforms.

Q27. Answer: (a) State Legislature

The correct answer is option 1,"Key Points: 1. The audit report of an apex co-operative society is mandated to be presented in the State Legislature as part of accountability and transparency measures. 2. This requirement is often outlined in the respective State Co-operative Societies Act or related legislations governing co-operative societies in each state. 3. Apex co-operative societies are the highest tier in the co-operative structure and are regulated more strictly due to their role in overseeing and supporting primary and secondary co-operatives. 4. Presenting audit reports to the State Legislature ensures that the functioning of these societies aligns with public interest and legal compliance. 5. The legislative presentation allows for scrutiny, ensuring that funds and operations of the apex co-operatives are used effectively for the intended purpose. Additional Information: 1. An apex co-operative society is a state-level co-operative organization that acts as a federation for district and primary co-operative societies. 2. Co-operative societies in India function under the framework of the Co-operative Societies Act, 1912, and respective state co-operative acts. 3. Audit reports typically include financial statements, compliance checks, and operational reviews to ensure the society adheres to its objectives. 4. The State Legislature's role in reviewing audit reports is part of its oversight function to ensure public accountability in organizations utilizing public funds or benefitting from government support. 5. Co-operative societies are also required to file regular returns and provide financial disclosures to the Registrar of Co-operative Societies."

Q28. Answer: (c) GK-JQ

The logic followed here is.

Option (1) 'RV-TB':

Option (2) 'EI-GO':

Option (3) 'GK-JQ':

Option (4) 'MQ-OW':

Thus, option 3 is odd one.

Hence, the correct answer is "Option 3".

Q29. Answer: (a) Rajasthan

The correct answer is option 1,

Key Points

• Jantar Mantar is located in Jaipur, Rajasthan, and is recognized as a UNESCO World Heritage Site.

• This astronomical observation site was built by Maharaja Sawai Jai Singh II in the early 18th century (1727–1734).

• It consists of a collection of 19 architectural astronomical instruments used for measuring time, predicting eclipses, tracking celestial objects, and determining the positions of planets and stars.

• The observatory houses the world's largest stone sundial, called the "Samrat Yantra."

• Jantar Mantar in Jaipur is one of the five such observatories built by Sawai Jai Singh II, but it is the largest and best-preserved among them.

Additional Information

• UNESCO World Heritage Site:

• Jantar Mantar was inscribed as a UNESCO World Heritage Site in 2010 for its cultural and scientific significance.

• It represents an excellent example of the scientific and cultural advancements of 18th-century India.

• Astronomical Instruments:

• Key instruments at Jantar Mantar include the Samrat Yantra (sundial), Jai Prakash Yantra (hemisphere), and Ram Yantra (altitude instruments).

• These instruments were designed to observe astronomical phenomena with the naked eye.

• Historical Context:

• Maharaja Sawai Jai Singh II, the founder of Jaipur, was a keen astronomer and mathematician.

• His interest in astronomy led to the construction of five observatories in Jaipur, Delhi, Ujjain, Mathura, and Varanasi, with Jaipur's being the most prominent.

• Tourist Attraction:

• Jantar Mantar in Jaipur is a popular tourist destination, attracting history and science enthusiasts from around the world.

• It is also used for educational purposes to teach astronomy and the history of science in India.

Q30. Answer: (a) 257

The logic followed here is:

Thus, the missing number in the series is 257.

Hence, the correct answer is "Option 1".

Q31. Answer: (d) 45

Shortcut Trick

Arrange the given data in ascending order: 17, 18, 22, 28, 32, 45, 57, 69, 75, 79, 91.

Count the total number of terms (n) = 11, which is an odd number.

The median is the middle-most term, which is the ((11 + 1) ÷ 2) = 6^(th) term.

The 6^(th) term in the sorted list is 45.

Therefore The correct answer is 45.

Alternate Method

Given: 75, 69, 45, 17, 22, 57, 79, 28, 18, 91, 32

Formula: Median = ((n + 1) ÷ 2)^(th) term (when n is odd)

=> Arrange the data in ascending order: 17, 18, 22, 28, 32, 45, 57, 69, 75, 79, 91

=> Total number of observations (n) = 11

=> Since n is odd, Median = ((11 + 1) ÷ 2)^(th) observation

=> Median = 6^(th) observation

Q32. Answer: (c) 7

Shortcut Trick

Solve the first quadratic equation: $x^2 - 5x + 6 = 0$ => $(x - 2)(x - 3) = 0$. Roots are 2 and 3.

Substitute x = 2 in the second equation: $2(2)^2 - k(2) + 6 = 0$ => $8 - 2k + 6 = 0$ => $2k = 14$ => $k = 7$.

Substitute x = 3 in the second equation: $2(3)^2 - k(3) + 6 = 0$ => $18 - 3k + 6 = 0$ => $3k = 24$ => $k = 8$.

Comparing the values with the given options, the valid possible value of k is 7.

Therefore The correct answer is 7.

Alternate Method

Given: Equations $x^2 - 5x + 6 = 0$ and $2x^2 - kx + 6 = 0$ share a common root.

Step 1: Find the roots of the first equation.

=> $x^2 - 5x + 6 = 0$

=> $x^2 - 3x - 2x + 6 = 0$

=> $x(x - 3) - 2(x - 3) = 0$

=> $(x - 3)(x - 2) = 0$

=> $x = 2$ or $x = 3$

Step 2: Substitute these roots into the second equation to find k.

If $x = 2$ is the common root:

=> $2(2)^2 - k(2) + 6 = 0$

=> $2(4) - 2k + 6 = 0$

=> $8 - 2k + 6 = 0$

=> $14 - 2k = 0$

=> $2k = 14$ => $k = 7$

If $x = 3$ is the common root:

=> $2(3)^2 - k(3) + 6 = 0$

=> $2(9) - 3k + 6 = 0$

=> $18 - 3k + 6 = 0$

=> $24 - 3k = 0$

=> $3k = 24$ => $k = 8$

Checking the options, the value 7 is present in option 3.

Therefore The correct answer is 7.

Additional Information

Condition for One Common Root

For equations $a1x^2 + b1x + c1 = 0$ and $a2x^2 + b2x + c2 = 0$, one root is common if $(c1a2 - c2a1)^2 = (a1b2 - a2b1)(b1c2 - b2c1)$.

Both Roots Common

Two quadratic equations have both roots common if the ratio of their coefficients is equal: $a1/a2 = b1/b2 = c1/c2$.

Vieta's Formulas

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

Q33. Answer: (b) ML - KJ

The logic followed here is.

Option (1) 'GK - JN':

Option (2) 'ML - KJ':

Option (3) 'EI - HL':

Option (4) 'LP - OS':

Thus, option 2 is odd one.

Hence, the correct answer is "Option 2".

Q34. Answer: (c) 2

Given:

A, B, L, M, S, T and Z are sitting around a circular table facing the centre.

Only four people sit between M and T when counted from the right of M.

M sits third to the left of L. S sits third to the left of Z.

B is an immediate neighbour of both T and L.

Thus, 2 people sit between A and B when counted from the right of A.

Hence, the correct answer is "Option 3".

Q35. Answer: (c) 100

Shortcut Trick

Convert all values to Paise units for easier calculation.

Value ratio = $(18 \times 50) : (12 \times 25) : (10 \times 10) = 900 : 300 : 100 = 9 : 3 : 1$.

Total units = 9 + 3 + 1 = 13 units → Rs. 130 (or 13000 Paise).

1 unit = Rs. 10. Since 10 Paise coins make up 1 unit of the total value, their value is Rs. 10 (1000 Paise).

Number of 10 Paise coins = 1000 ÷ 10 = 100 coins.

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Therefore The correct answer is 100 coins.

Alternate Method

Given: Ratio of 50P : 25P : 10P = 18 : 12 : 10. Let the numbers be 18x, 12x, and 10x.

Formula Used: Total Value = ∑(Number of coins × Denomination value)

=> Value of 50P coins = 18x × 0.50 = Rs. 9x

=> Value of 25P coins = 12x × 0.25 = Rs. 3x

=> Value of 10P coins = 10x × 0.10 = Rs. 1x

=> Total Amount: 9x + 3x + 1x = 130

=> 13x = 130

=> x = 10

=> Number of 10 Paise coins = 10x = 10 × 10 = 100

Therefore The correct answer is 100 coins.

Additional Information

Coin Denomination Rule

Always maintain consistency in units. Either convert all denominations to Rupees or all to Paise (1 Rupee = 100 Paise).

Ratio of Value vs Ratio of Number

Value Ratio = (Number Ratio × Denomination). If Value Ratio is given, Number Ratio = Value Ratio ÷ Denomination.

Compound Ratio

In multi-variable ratio problems, the resultant total is found by multiplying the individual ratios with their respective weights or values.

Q36. Answer: (a) 12

The given three-digit numbers are: 917, 782, 549, 557, 539.

Now,

The highest number is 917. Its first digit is 9.

The lowest number is 539. Its second digit is 3.

Add the first digit of the highest number 9 to the second digit of the lowest number 3.

9 + 3 = 12.

Hence, the correct answer is "Option 1".

Q37. Answer: (a) 4 km in the west

Given:

Mr. IJK starts from Point A and drives 23 km towards the south.

He then takes a right turn, drives 3 km, turns right and drives 27 km.

He then takes a right turn and drives 7 km. He takes a final right turn, drives 4 km and stops at Point P.

Thus, IJK has to drive 4 km west to reach point A.

Hence, the correct answer is "Option 1".

Q38. Answer: (d) Slide Sorter View

The correct answer is Slide Sorter View.

Key Points

• The Slide Sorter View in Microsoft PowerPoint displays all slides in a presentation as thumbnails, allowing users to easily rearrange, delete, or apply transitions between slides.

• This view provides a bird's-eye view of the entire presentation, making it easier to organize slides and review the flow of content.

• Slide Sorter View is especially useful for large presentations with numerous slides, as it enables quick identification and movement of specific slides.

• It can be accessed from the View tab on the Ribbon or by clicking on the Slide Sorter icon in the bottom-right corner of the PowerPoint interface.

• In this view, users can also apply slide transitions to multiple slides simultaneously by selecting them and using the Transitions tab.

Additional Information

• Outline View

• Outline View displays the text content of the slides in a hierarchical structure without showing visual elements such as images or designs.

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• This view is useful for focusing on the content and structure of the presentation.
• Reading View
• Reading View allows users to preview how the presentation will appear in full screen but within the PowerPoint window itself.
• It is designed for reviewing presentations without the need to start the Slide Show mode.
• Slide Show View
• Slide Show View runs the presentation in full-screen mode, displaying slides sequentially with applied animations and transitions.
• This is the view used during an actual presentation to an audience.
• Normal View
• Normal View is the default view in PowerPoint, where users can edit slides, add content, and view the slide pane, notes pane, and slide thumbnails simultaneously.
• It provides a detailed workspace for creating and customizing individual slides.
"

Q39. Answer: (d) Three

Given:

1 is added to each even digit and 2 is subtracted from each odd digit in the number 72384596.

Given	7	2	3	8	4	5	9	6
Operation	-2	+1	-2	+1	+1	-2	-2	+1
New number	5	3	1	9	5	3	7	7

The new number formed is 53195377.

The digits 5, 3, and 7 appear more than once.

Thus, three digits appear more than once.

Hence, the correct answer is "Option 4".

Q40. Answer: (b) 7

The given three-digit numbers are: 411, 559, 916, 247, 769.

Now,

The highest number is 916. Its first digit is 9.

The lowest number is 247. Its first digit is 2.

Subtract the first digit of the lowest number 2 from the first digit of the highest number 9.

9 - 2 = 7.

Hence, the correct answer is "Option 2".

Q41. Answer: (c) 3sinA

Shortcut Trick

Apply Trigonometric Identities directly: $1 + \tan^2A = \sec^2A$ and $1 + \cot^2A = \text{cosec}^2A$.

Numerator: $3(1 + \tan^2A)\cot A = 3\sec^2A \cot A = 3 \times (1/\cos^2A) \times (\cos A/\sin A) = 3/(\cos A \sin A)$.

Denominator: $(1 + \cot^2A)\sec A = \text{cosec}^2A \sec A = (1/\sin^2A) \times (1/\cos A) = 1/(\sin^2A \cos A)$.

Ratio: $[3/(\cos A \sin A)] \div [1/(\sin^2A \cos A)] = [3/(\cos A \sin A)] \times [\sin^2A \cos A] = 3\sin A$.

Therefore The correct answer is 3sinA.

Alternate Method

Given: Expression = $[(3 + 3\tan^2A)\cot A] / [(1 + \cot^2A)\sec A]$

Formula Used: $1 + \tan^2A = \sec^2A$; $1 + \cot^2A = \text{cosec}^2A$; $\sec A = 1/\cos A$; $\text{cosec} A = 1/\sin A$; $\cot A = \cos A/\sin A$.

=> Expression = $[3(1 + \tan^2A)\cot A] / [(1 + \cot^2A)\sec A]$

=> Expression = $[3\sec^2A \times \cot A] / [\text{cosec}^2A \times \sec A]$

=> Expression = $[3\sec A \times \cot A] / [\text{cosec}^2A]$

=> Expression = $[3 \times (1/\cos A) \times (\cos A/\sin A)] / [1/\sin^2A]$

=> Expression = $[3/\sin A] / [1/\sin^2A]$

=> Expression = $(3/\sin A) \times \sin^2A$

=> Expression = $3\sin A$

Therefore The correct answer is 3sinA.

Additional Information

Pythagorean Identities

Fundamental relations: $\sin^2\theta + \cos^2\theta = 1$, $1 + \tan^2\theta = \sec^2\theta$, and $1 + \cot^2\theta = \operatorname{cosec}^2\theta$.

Reciprocal Relations

$\sec\theta = 1/\cos\theta$, $\operatorname{cosec}\theta = 1/\sin\theta$, and $\cot\theta = 1/\tan\theta$.

Ratio Identities

$\tan\theta = \sin\theta/\cos\theta$ and $\cot\theta = \cos\theta/\sin\theta$.

Q42. Answer: (d) 8944

Given:

Evaluate: 86×104

Formula used:

Multiplication: $a \times b = \text{Product}$

Calculation:

86×104

$\Rightarrow 86 \times (100 + 4)$

$\Rightarrow (86 \times 100) + (86 \times 4)$

$\Rightarrow 8600 + 344$

$\Rightarrow 8944$

Therefore The correct answer is option (4).

Q43. Answer: (b) 12

Shortcut Trick

Work rate of B = $(1/20) - (1/45) = (9 - 4) / 180 = 5 / 180 = 1 / 36$.

Total time for B alone = 36 days.

Time for 1/3 of the work = $36 \times (1/3) = 12$ days.

Therefore The correct answer is 12 days.

Alternate Method

Given:

Time taken by A + B = 20 days

Time taken by A alone = 45 days

Formula Used:

Efficiency = Total Work ÷ Time

Person	Days	Total Work	Efficiency
A + B	20	180	9
A	45	4	

Calculations:

$\Rightarrow$ Efficiency of B = Efficiency of (A + B) − Efficiency of A

$\Rightarrow$ Efficiency of B = 9 − 4 = 5 units/day

$\Rightarrow$ Total work to be done by B = $1/3 \times 180 = 60$ units

$\Rightarrow$ Time taken by B = $60 \div 5 = 12$ days

Therefore The correct answer is 12 days.

Additional Information

Pipes & Cisterns Relation

The concept of Time and Work is identical to filling a tank. If two pipes fill a tank in T days and one fills in T1, the other takes $(T \times T1) \div (T1 - T)$ days.

Work & Wages

Wages are distributed in the direct ratio of the efficiency of the workers or the ratio of work done.

Alternate Day Work

In alternate day problems, calculate work done in a 2-day cycle first, then multiply to reach near the total work.

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Q44. Answer: (b) 41.9

Shortcut Trick

Net difference in observations = Correct value − Incorrect value = 50 − 31 = +19.

Adjustment in average = Net difference ÷ Total observations = 19 ÷ 10 = +1.9.

Correct average = Old Average + Adjustment = 40 + 1.9 = 41.9.

Therefore The correct answer is 41.9.

Alternate Method

Given:

Number of observations (n) = 10

Initial Average = 40

Incorrect observation = 31

Correct observation = 50

Formula Used:

Average = Sum of observations ÷ Number of observations

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

Calculations:

=> Initial Sum = 40 × 10 = 400

=> Correct Sum = 400 − 31 + 50

=> Correct Sum = 369 + 50 = 419

=> Correct Average = 419 ÷ 10

=> Correct Average = 41.9

Therefore The correct answer is 41.9.

Additional Information

Effect of Change on Average

If each observation is increased or decreased by a constant 'k', the average also increases or decreases by 'k'. New Average = Old Average ± k.

Weighted Average

When two groups with averages A1 and A2 and sizes n1 and n2 are combined, the combined average is (n1A1 + n2A2) ÷ (n1 + n2).

Net Deviation Method

The sum of deviations of all observations from their mean is always zero. This property is used to quickly find missing values or corrections.

Q45. Answer: (b) Double-click the .pptx file in File Explorer

The correct answer is Double-click the .pptx file in File Explorer.

Key Points

• Double-clicking a .pptx file in File Explorer directly opens the presentation in MS PowerPoint.

• This method bypasses the need to manually launch PowerPoint and select the file, saving time and effort.

• It is the most straightforward way for users already familiar with File Explorer navigation.

• Supported file formats include .pptx, .ppt, and other PowerPoint-compatible extensions, ensuring seamless compatibility.

• Make sure MS PowerPoint is set as the default program for opening .pptx files for this method to work effectively.

Additional Information

• .pptx File Format

• .pptx is the default file extension for Microsoft PowerPoint presentations created in versions 2007 and later.

• It is based on the Open XML format, which provides better data compression and improved recovery options.

• Default Program Settings

• To open a .pptx file by double-clicking, ensure MS PowerPoint is set as the default program for this file type.

• On Windows, this can be adjusted through the "Default Apps" settings in the system menu.

• Keyboard Shortcuts for MS PowerPoint

• Ctrl + O: Opens the file explorer to locate and open a presentation.

• Alt + F4: Closes the currently active window or application.

• File Explorer Navigation

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• Windows File Explorer is used to navigate, organize, and manage files, including PowerPoint files.
• It provides a graphical user interface for quick access to files stored on a computer.

Q46. Answer: (b) # = SAG, % = PXD

Given:
: XFL :: KSY : %
Option 1) # = SAG, % = PXO
For # (SAG) to XFL
For KSY to % (PXO)
Option 1 is incorrect.
Option 2) # = SAG, % = PXD
For # (SAG) to XFL
For KSY to % (PXD)
Option 2 is correct.
Option 3) # = SAG, % = PID
For # (SAG) to XFL
For KSY to % (PID)
Option 3 is incorrect.
Option 4) # = TAG, % = PXD
For # (TAG) to XFL
For KSY to % (PXD)
Option 4 is incorrect.
Hence, the correct answer is "Option 2".

Q47. Answer: (d) 40

Shortcut Trick
For four numbers a, b, c, d to be in proportion, the product of extremes equals the product of means (ad = bc).
Given: 48, 96, 20, y are in proportion.
Ratio of first two = 48 : 96 = 1 : 2.
Ratio of next two must be same => 20 : y = 1 : 2.
Therefore y = 20 × 2 = 40.
Therefore The correct answer is 40.
Alternate Method
Given: Numbers 48, 96, 20, and y are in proportion.
Formula Used: If a, b, c, d are in proportion, then a/b = c/d.
=> 48/96 = 20/y
=> 1/2 = 20/y
=> y = 20 × 2
=> y = 40
Therefore The correct answer is 40.
Additional Information
Fourth Proportional
The fourth proportional to three numbers a, b, and c is d such that a : b = c : d, calculated as d = (b × c) / a.
Continued Proportion
Three numbers a, b, and c are in continued proportion if a : b = b : c, where b is the mean proportional (b = √ac).
Componendo and Dividendo
If a/b = c/d, then (a + b)/(a − b) = (c + d)/(c − d). This rule is widely used to solve ratio-based equations quickly.

Q48. Answer: (a) NGL70

The pattern followed here is.
Thus, the missing term in the series is NGL70.
Hence, the correct answer is Option 1.

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Q49. Answer: (c) Myanmar

The correct answer is option 3,"

Key Points

• The Nicobar Islands are situated in the eastern Indian Ocean and are part of the Andaman and Nicobar Islands, a Union Territory of India.

• The Nicobar Islands are located closest to Myanmar, with its northernmost island being approximately 150 km away from Myanmar's southern coast.

• Geographically, the Nicobar Islands lie to the south of the Andaman Islands and are separated by the Ten Degree Channel.

• Myanmar's proximity to the Nicobar Islands is closer compared to other options such as Malaysia, China, or Sri Lanka, making it the correct answer.

• The Nicobar Islands have strategic importance for India due to their proximity to international shipping routes and neighboring nations like Myanmar and Indonesia.

Additional Information

• Andaman and Nicobar Islands:

• These islands form an archipelago consisting of 572 islands in the Bay of Bengal, with only a few being inhabited.

• The Andaman Islands lie to the north, while the Nicobar Islands lie to the south, separated by the Ten Degree Channel.

• These islands are of significant ecological importance, being home to rare flora and fauna.

• Ten Degree Channel:

• A water channel that separates the Andaman Islands from the Nicobar Islands.

• It is named so because it lies along the 10-degree line of latitude north of the equator.

• Myanmar's Proximity:

• Myanmar is geographically located to the east of the Bay of Bengal.

• Its southern coastline lies closest to the Nicobar Islands, making it the nearest country to this group of islands.

• Strategic Importance:

• The Nicobar Islands hold strategic maritime significance due to their location near major shipping routes in the Indian Ocean region.

• India maintains naval and air bases on the Andaman and Nicobar Islands to safeguard its maritime interests.

"

Q50. Answer: (a) Merged PIO and OCI card schemes

The correct answer is option 1,The 2015 Amendment to the Citizenship Act brought significant changes to simplify and consolidate the provisions related to Indian citizenship.

Key Points

• The 2015 Amendment merged the Person of Indian Origin (PIO) and Overseas Citizen of India (OCI) card schemes into a single category called OCI.

• This was introduced to eliminate confusion between the two schemes and simplify the application process for foreign nationals of Indian origin.

• OCI cardholders were granted several benefits, including visa-free travel to India, exemption from registration with authorities, and access to certain economic and educational privileges.

• The merger was intended to strengthen ties with the Indian diaspora by providing a streamlined and unified framework.

• The amendment also clarified eligibility criteria and procedures for obtaining OCI cards, making it more accessible for qualifying individuals.

Additional Information

• Person of Indian Origin (PIO) Card:

• Introduced in 1999, the PIO card was issued to foreign nationals of Indian origin for facilitating long-term visa-free travel and residency in India.

• PIO cardholders had limited benefits compared to OCI cardholders, such as restrictions on employment and property acquisition.

• Overseas Citizen of India (OCI) Card:

• OCI was introduced in 2005 as part of efforts to strengthen ties with the Indian diaspora.

• OCI cardholders enjoy more benefits than PIO cardholders, including lifelong visa-free travel and access to certain economic and educational opportunities.

• Citizenship Act of 1955:

• The Citizenship Act governs the acquisition, termination, and supplemental provisions of Indian citizenship.

• It has been amended several times to accommodate changing socio-political and global scenarios.

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• Indian Diaspora:

• The Indian diaspora refers to people of Indian origin living outside India, estimated to be over 30 million globally.

• Government initiatives like OCI aim to foster connections and tap into the potential of this community.

Q51. Answer: (b) They consist of both s- and p-block elements

The correct answer is option 2,

Key Points

• Representative elements include elements from both the s-block (Groups 1 and 2) and the p-block (Groups 13 to 18) of the periodic table.

• These elements are characterized by having their outermost electrons in s- or p-orbitals, which define their chemical properties.

• Representative elements encompass a wide range of elements, including metals, nonmetals, and metalloids.

• Examples of representative elements include hydrogen, sodium (s-block), and chlorine (p-block).

• They are distinct from transition elements, which have partially filled d-orbitals.

Additional Information

• s-block elements: These include alkali metals (Group 1) and alkaline earth metals (Group 2). They are characterized by their high reactivity, low ionization energy, and the presence of electrons in the s-orbital.

• p-block elements: Found in Groups 13 to 18, p-block elements include metals, nonmetals, and metalloids, and exhibit diverse properties such as variable oxidation states and covalent bonding.

• Transition elements: These are found in the d-block (Groups 3 to 12) and are distinguished by their partially filled d-orbitals, leading to properties like variable oxidation states and the formation of colored compounds.

• Periodic table structure: The periodic table is divided into blocks based on the type of orbital being filled (s-block, p-block, d-block, and f-block). Representative elements are part of the s- and p-blocks.

• Metalloids: Some representative elements, such as silicon and boron, are classified as metalloids and exhibit properties intermediate between metals and nonmetals.

Q52. Answer: (b) Layout tab -> Margins

The correct answer is option 2,

Key Points

• Margins in MS Word can be adjusted using the Layout tab, where the Margins option is located.

• The Layout tab provides predefined margin settings such as Normal, Narrow, Moderate, Wide, Mirrored, and allows custom margin adjustments.

• To modify margins, navigate to Layout tab -> Margins -> Choose a predefined option or select "Custom Margins" for advanced adjustments.

• Custom margins can be set by defining the Top, Bottom, Left, and Right margins in the Page Setup dialog box.

• Changing margins affects the entire document or can be limited to specific sections using section breaks.

Additional Information

• Page Setup:

• The Page Setup dialog box contains options to modify margins, paper size, orientation, and layout settings.

• It can be accessed through the Layout tab or by right-clicking on the ruler.

• Section Breaks:

• Section breaks allow users to create different margin setups within a single document.

• They can be added via Layout tab -> Breaks -> Select Section Break type.

• Ruler Adjustment:

• Margins can also be adjusted using the ruler by dragging the margin indicators directly.

• This method offers a quick way to visually adjust margins without using the Layout tab.

• Orientation Impact:

• Changing page orientation (Portrait or Landscape) can influence margin settings.

• Orientation settings are available in the Layout tab -> Orientation.

Q53. Answer: (c) 89

BODMAS Rule:

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

Original Letter	A	B	C	D

New Symbol	÷	×	•	–

Now, given the equation: 89 D 7 B 5 C (78 A 6) C 22 = ?

After interchanging the specified letters, the new equation is:

89 − 7 × 5 + (78 ÷ 6) + 22 = ?

Perform operations according to BODMAS:

=> 89 − 7 × 5 + (78 ÷ 6) + 22

=> 89 − 7 × 5 + 13 + 22

=> 89 − 35 + 13 + 22

=> 54 + 13 + 22

=> 67 + 22

=> 89

Hence, the correct answer is "Option 3".

Q54. Answer: (a) 8

Given:

2 is added to each even digit and 1 is subtracted from each odd digit in the number 4123957.

Given	**4**	**1**	**2**	**3**	**9**	**5**	**7**
Operation	+2	-1	+2	-1	-1	-1	-1
New number	6	0	4	2	8	4	6

The new number formed is 6042846.

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

The greatest digit in the new number is 8.

The smallest digit in the new number is 0.

Difference between the greatest and smallest digits

= 8 - 0 = 8.

Hence, the correct answer is "Option 1".

Q55. Answer: (b) Empowering Indian Youth for Global Leadership in Science and Innovation for India's Bright Future

The correct answer is Empowering Indian Youth for Global Leadership in Science and Innovation for India's Bright Future.

Key Points

• The theme for National Science Day 2025 is "Empowering Indian Youth for Global Leadership in Science and Innovation for India's Bright Future."

• The focus of this theme is to highlight the role of young minds in driving scientific research, innovation, and global leadership in the field of science and technology.

• National Science Day is celebrated on 28th February every year to commemorate the discovery of the Raman Effect by Sir C.V. Raman in 1928.

• This theme aligns with the Indian government's vision of promoting scientific excellence and innovation as key drivers of economic growth and national development.

• Various activities such as seminars, exhibitions, and science fairs are conducted across schools, colleges, and research institutions to raise awareness about the importance of science in daily life.

Additional Information

• Raman Effect:

• Discovered by Indian physicist Sir C.V. Raman on February 28, 1928.

• It explains the scattering of light when it passes through a transparent medium, resulting in a change in its wavelength.

• This discovery earned C.V. Raman the Nobel Prize in Physics in 1930.

• Purpose of National Science Day:

• To spread awareness about the importance of science in improving the quality of life.

• Encourages young minds to pursue careers in science and research.

• Science and Youth Empowerment:

• Youth-driven research and innovation play a crucial role in addressing global challenges such as climate change, health crises, and technological advancements.

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• India's National Education Policy (NEP) 2020 emphasizes STEM (Science, Technology, Engineering, and Mathematics) education to foster innovation.

• India's Global Leadership in Science:

• India has emerged as a global leader in space exploration, biotechnology, and IT-driven innovations.

• Initiatives like Startup India and Make in India encourage scientific entrepreneurship among youth.

Q56. Answer: (d) 1

Given : Each of P, Q, R, S, T, U and V has an exam on a different day of a week, starting from Monday and ending on Sunday of the same week.

1) T has an exam on Thursday.

2) U has an exam immediately before T and P has an exam immediately after T.

Weekday	Person
Monday	
Tuesday	
Wednesday	U
Thursday	T
Friday	P
Saturday	
Sunday	

3) Only 3 people have exams between Q and V.

4) R has an exam immediately after V.

Let's consider the two cases for Q and V:

Weekday	Case 1	Case 2
Monday		
Tuesday	Q	V
Wednesday	U	U
Thursday	T	T
Friday	P	P
Saturday	V	Q
Sunday		

Case 2 (V on Tuesday, Q on Saturday):V is on Tuesday. R has an exam immediately after V, so R would be on Wednesday. However, U is already on Wednesday. Thus, Case 2 is Eliminated.

The final arrangement is based on Case 1.

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

Thus, there is 1 person who has an exam before Q.

Hence, the correct answer is "Option 4".

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Q57. Answer: (d) Rs. 4,122

The correct answer is Rs. 4,122.

Key Points

• The estimated monthly per capita household consumption expenditure in rural India is Rs. 4,122, as per the Household Consumption Expenditure Survey: 2023-24.

• This survey is conducted periodically by the National Statistical Office (NSO), under the Ministry of Statistics and Programme Implementation (MoSPI).

• It measures consumption expenditure patterns to assess the standard of living and economic well-being of households.

• The data serves as a basis for calculating important economic indicators, including the Poverty Line and Gross Domestic Product (GDP).

• Rural consumption expenditure reflects household spending on essentials like food, housing, clothing, healthcare, education, and other goods and services.

Additional Information

• Household Consumption Expenditure Survey (HCES)

• It is a nationwide survey conducted every five years to collect data on household expenditure.

• The survey provides insights into the consumption habits of households across rural and urban areas.

• Key parameters include food items, non-food items, durable goods, and services.

• HCES data is used to estimate poverty levels, inequality, and budgetary policies.

• Per Capita Household Expenditure

• This metric is derived by dividing the total household expenditure by the number of members in the household.

• It is an important indicator of the standard of living and purchasing power of individuals.

• Comparison of Rural and Urban Consumption

• Rural consumption is typically focused on necessities like food and basic services.

• Urban households spend more on discretionary items such as entertainment, electronics, and luxury goods.

• Use of HCES Data

• Data is used to design and evaluate government welfare programs like the Public Distribution System (PDS).

• It helps in identifying vulnerable groups and framing poverty alleviation policies.

• It is crucial for economic planning and measuring inequality through indicators like the Gini coefficient.

Q58. Answer: (d) One

Given:

Seven friends, A, B, C, D, E, F and O, are sitting in a row facing north.

Only two people sit to the left of F. Only three people sit between F and A.

Only one person sits between A and O. D sits to the immediate left of C.

E is not an immediate neighbour of A.

Thus, 1 people sit to the right of B.

Hence, the correct answer is "Option 4".

Q59. Answer: (c) District judges and civil judicial posts below them

The correct answer is option 3,"

Key Points

• The term 'judicial service' under Articles 233-237 of the Indian Constitution is defined as district judges and civil judicial posts below them.

• Judicial service is distinct from executive or administrative posts and is concerned with posts exclusively connected with the administration of justice.

• Articles 233-237 specifically deal with provisions for appointment, conditions of service, and independence of the judiciary in the subordinate courts.

• The appointment of district judges is made by the Governor of the State in consultation with the High Court under Article 233.

• Other civil judicial posts below the rank of district judge are regulated by Article 234 and are managed by the State Public Service Commission or other prescribed authorities.

Additional Information

• Article 233: Deals with the appointment of district judges by the Governor in consultation with the High Court.

• Article 234: Governs recruitment to posts below district judges through methods prescribed by state law.

• Article 235: Provides for the High Court's control over the subordinate judiciary regarding their posting, promotion, and leave.

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• Article 236: Defines the term 'district judge' and includes various judicial posts such as additional district judges and chief judges of small courts.
• Article 237: Enables the State to apply provisions of judicial service to magistrates performing judicial functions.
"

Q60. Answer: (a) 28

Shortcut Trick
In a trapezium with parallel sides a and b, the length of the segment joining the midpoints of the diagonals is given by the formula:
EF = |b − a| ÷ 2
=> EF = (86 − 30) ÷ 2
=> EF = 56 ÷ 2 = 28 cm.
Therefore The correct answer is 28 cm.
Alternate Method
Given: AB = 30 cm, DC = 86 cm, AB || DC. E and F are midpoints of diagonals AC and BD.
Formula Used: Length of segment joining midpoints of diagonals = (Difference of parallel sides) ÷ 2
A
B
C
D
E
F
30 cm
86 cm

Q61. Answer: (a) 6820

Shortcut Trick
Total Surface Area (TSA) = Curved Surface Area (CSA) + Base Area
TSA = 2970 + πr^2
TSA = 2970 + (22/7) × 35 × 35 = 2970 + 3850
TSA = 6820 cm^2
Therefore The correct answer is 6820 cm^2.
Alternate Method
Given:
Curved Surface Area (CSA) = 2970 cm^2
Diameter (d) = 70 cm => Radius (r) = 35 cm
Formula Used:
Total Surface Area (TSA) = CSA + πr^2
=> Area of the circular base = $\pi \times r^2$
=> Base Area = (22/7) × 35 × 35
=> Base Area = 22 × 5 × 35 = 110 × 35 = 3850 cm^2
=> Total Surface Area = CSA + Base Area
=> TSA = 2970 + 3850
=> TSA = 6820 cm^2
Therefore The correct answer is 6820 cm^2.
Additional Information
Slant Height of Cone
The slant height (l) is given by $l = \sqrt{(h^2 + r^2)}$, where h is the vertical height and r is the radius.
Volume of a Cone
The volume (V) of a cone is $(1/3)\pi r^2 h$, which is exactly one-third the volume of a cylinder with the same radius and height.
CSA Formula
The Curved Surface Area is also calculated as πrl, where r is the radius and l is the slant height.

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Q62. Answer: (b) Periods

The correct answer is option 2,

Key Points

• A horizontal row in the periodic table is known as a period.

• Periods indicate the principal energy level or shell that the electrons occupy for a given element.

• There are 7 periods in the modern periodic table, ranging from Period 1 to Period 7.

• As we move from left to right across a period, the atomic number increases sequentially, meaning the number of protons in the nucleus increases.

• Elements in the same period exhibit a gradual variation in properties such as atomic radius, ionization energy, and electronegativity.

Additional Information

• Groups vs. Periods:

• Groups: Vertical columns in the periodic table, categorized into 18 groups, represent elements with similar chemical properties.

• Periods: Horizontal rows where properties change progressively across the row due to increasing atomic number.

• Periodic Trends: Trends such as atomic size, ionization energy, and electronegativity change across a period due to increasing nuclear charge.

• Electron Configuration: Elements in a period have electrons filling the same principal energy level (shell).

• Periodic Table Organization: The periodic table is based on the periodic law, which states that the properties of elements are periodic functions of their atomic numbers.

• Lanthanides and Actinides: These form part of Periods 6 and 7, placed separately at the bottom of the table for better visualization.

Q63. Answer: (b) 3

Given:

The number is 3187952.

Arranging the digits of the number 3187952 in ascending order from left to right:

Original Position	1st	2nd	3rd	4th	5th	6th	7th
Original Digit	3	1	8	7	9	5	2
Sorted Digit	1	2	3	5	7	8	9

The new number formed is 1235789.

The third digit from the left in the new number is 3.

Hence, the correct answer is "Option 2".

Q64. Answer: (a) World Audio Visual & Entertainment Summit

The correct answer is option 1,

Key Points

• The World Audio Visual & Entertainment Summit is scheduled to be held at the Jio World Convention Centre, Mumbai, in May 2023.

• This summit focuses on innovations and developments in the audio-visual and entertainment industry.

• It serves as a platform for industry leaders, creators, and technologists to showcase advancements and collaborate on future projects.

• The summit aims to promote India's audio-visual industry globally and enhance its competitiveness.

• Participants include content creators, filmmakers, producers, technology providers, and policy makers from India and around the world.

Additional Information

• The audio-visual industry encompasses film, television, music, gaming, and digital content creation.

• India is one of the largest producers of films globally, with Bollywood being a major contributor.

• The entertainment sector in India is experiencing rapid growth due to increased digital consumption and technological advancements.

• Technologies such as Augmented Reality (AR), Virtual Reality (VR), Artificial Intelligence (AI), and cloud-based solutions are revolutionizing the audio-visual landscape.

• Government initiatives like Make in India and support for digital content creation have boosted the entertainment and media

sector's growth.

Q65. Answer: (a) Lala Har Dayal

The correct answer is Lala Har Dayal.

Key Points

• Lala Har Dayal was the key founder and ideological leader of the Ghadar Party, established in 1913 in San Francisco.

• The Ghadar Party was founded with the aim of overthrowing British rule in India through revolutionary means.

• Lala Har Dayal was a scholar, revolutionary, and ardent advocate of freedom, who inspired Indian immigrants in the United States and Canada to join the struggle for India's independence.

• The name "Ghadar" was derived from the Urdu word for "mutiny" or "rebellion," symbolizing the party's aim to incite an armed uprising against British colonial rule.

• Under Lala Har Dayal's leadership, the Ghadar Party launched the "Ghadar Newspaper", a weekly publication that galvanized Indians worldwide to support the revolutionary movement.

Additional Information

• Ghadar Party:

• The Ghadar Party was primarily composed of Indian immigrants, notably Sikhs and Punjabis, living in the United States and Canada.

• It aimed to inspire Indians across the globe to unite and fight against British imperialism.

• The party's headquarters, called the "Yugantar Ashram," was based in San Francisco.

• Lala Har Dayal's Ideology:

• Lala Har Dayal was influenced by a mix of socialist, anarchist, and nationalist ideas.

• He believed in the power of education and self-reliance as tools to achieve political freedom.

• Other Key Figures:

• While Lala Har Dayal was the ideological leader, other prominent members included Sohan Singh Bhakna and Kartar Singh Sarabha.

• Kartar Singh Sarabha, though young, became a symbol of sacrifice and dedication within the Ghadar movement.

• Impact of the Ghadar Movement:

• The movement laid the foundation for revolutionary activities in India and abroad.

• Though it failed to achieve its immediate goal, the Ghadar Party's efforts significantly influenced subsequent nationalist movements.

Q66. Answer: (a) 13 April 2025

The correct answer is option 1,Key Points

• Expo 2025 Osaka will officially open on 13 April 2025, marking the beginning of a globally significant event.

• The Expo will be held on Yumeshima Island in Osaka, Japan, and will run until October 13, 2025.

• The theme for Expo 2025 Osaka is "Designing Future Society for Our Lives."

• The Expo aims to address global challenges such as sustainability, innovation, and societal well-being through international collaboration.

• Over 150 countries and organizations are expected to participate in the Expo, showcasing advancements in science, technology, and culture.

Additional Information

• World Expos: World Expos are global events that take place every five years, focusing on themes of universal significance to foster innovation and collaboration.

• Expo 2020 Dubai: The previous Expo was held in Dubai, UAE, from October 1, 2021, to March 31, 2022, after being postponed due to the COVID-19 pandemic.

• Expo History: The first World Expo was held in London in 1851, known as "The Great Exhibition," showcasing industrial and technological advancements.

• Bureau International des Expositions (BIE): The BIE is the organization responsible for overseeing World Expos, ensuring their adherence to international standards.

• Future Expos: After Expo 2025 Osaka, the next Expo is scheduled to be held in Riyadh, Saudi Arabia, in 2030.

Q67. Answer: (b) Anahat Singh

The correct answer is option 2,

Key Points

• Anahat Singh is an emerging star in Indian squash and has gained recognition at both national and international levels.

• She won the women's singles title at the Indian Open 2025 Professional Squash Association (PSA) Copper event, showcasing her exceptional talent and skills.

• Anahat Singh is known for her aggressive playing style and tactical approach on the court, which has earned her accolades.

• The Indian Open 2025 PSA Copper event is part of the PSA World Tour, which features competitive squash tournaments globally.

• This victory marks a significant achievement in Anahat Singh's career and highlights her potential as a top contender in the sport of squash.

Additional Information

• Professional Squash Association (PSA)

• The PSA is the global governing body for professional squash, organizing tournaments and rankings.

• It manages the PSA World Tour, which includes a range of events from Bronze to Platinum levels, based on prize money and player participation.

• PSA promotes the growth of squash through international competitions and player development.

• Squash in India

• Squash is governed in India by the Squash Rackets Federation of India (SRFI).

• India has produced several notable squash players, including Joshna Chinappa, Dipika Pallikal, and Saurav Ghosal.

• National and international tournaments, like the Indian Open, play a key role in promoting the sport in the country.

• Squash Scoring System

• Modern squash matches are typically played using the Point-A-Rally (PAR) scoring system.

• Each match consists of best-of-five games, with players earning points on every rally.

• The first player to reach 11 points wins the game, provided they have a lead of at least two points.

• Benefits of Playing Squash

• Squash is a high-intensity sport that improves cardiovascular fitness and agility.

• It enhances hand-eye coordination and reflexes, making it a great choice for athletes.

• Playing squash also helps in stress relief and mental focus due to its fast-paced nature.

Q68. Answer: (d) 2 2/9 hours

Shortcut Trick

Total Work = LCM of 5, 6, and 12 = 60 units.

Efficiencies: m = 12, n = 10, p = 5.

Combined Efficiency = 12 + 10 + 5 = 27 units/hr.

Time required = 60 ÷ 27 = 20 ÷ 9 = 2 2/9 hours.

Therefore The correct answer is 2 2/9 hr.

Alternate Method

Given: Pipe m = 5 hr, Pipe n = 6 hr, Pipe p = 12 hr.

Formula Used: Total Work = Time × Efficiency

Person	Days	Total Work	Efficiency
m	5	60	12
n	6	10	
p	12	5	

Calculations:

=> Total Efficiency of (m + n + p) = 12 + 10 + 5 = 27 units/hr

=> Total Time Taken = Total Work ÷ Total Efficiency

=> Time = 60 ÷ 27

=> Time = 20 ÷ 9

=> Time = 2 2/9 hours

Therefore The correct answer is 2 2/9 hr.

Additional Information

Combined Work Formula

If two pipes fill a tank in x and y hours, they together fill it in (xy)/(x+y) hours.

Pipes and Cisterns Rule

Efficiency of an inlet pipe is positive, while efficiency of an outlet (leak) pipe is negative.

Alternate Filling

If pipes operate on alternate hours, calculate the work done in one cycle (sum of their efficiencies) and then find the total cycles.

Q69. Answer: (b) Coexistence of public and private sectors

The correct answer is option 2,"

Key Points

• A mixed economy refers to a system where the public and private sectors coexist and operate simultaneously, contributing to economic growth and development.

• India adopted the mixed economy model during its Five-Year Plans to combine the advantages of both capitalist and socialist frameworks.

• The public sector focuses on essential services, infrastructure, and industries requiring large investments, while the private sector drives innovation, efficiency, and market-oriented growth.

• The mixed economy approach was designed to ensure equitable distribution of resources and promote balanced development across all sectors of the economy.

• This model enabled India to maintain state control over strategic industries like defense, railways, and energy, while allowing private enterprises to flourish in areas like consumer goods and services.

Additional Information

• Public Sector:

• Refers to enterprises owned and operated by the government.

• Key industries include railways, defense, energy, and heavy industries.

• Aims to ensure equitable distribution of wealth and provide essential services.

• Private Sector:

• Comprises businesses owned and operated by private individuals or organizations.

• Focuses on innovation, efficiency, and profitability.

• Includes industries like consumer goods, technology, and retail.

• Five-Year Plans:

• India's economic planning strategy initiated in 1951 under the Planning Commission.

• Each plan focused on specific goals like industrialization, poverty reduction, and agricultural growth.

• Socialist Framework:

• Emphasizes state ownership and control over resources.

• Aims to reduce income inequality and promote social welfare.

• Capitalist Framework:

• Encourages private ownership and market-driven growth.

• Focuses on individual entrepreneurship and competition.

"

Q70. Answer: (b) Both conclusions (I) and (II) follow

The least possible venn diagram is:

Conclusions:

(I) No terrace is a field → True (As, All terraces are lawns, All lawns are grounds, No ground is a field. so, No terrace is a field holds true)

(II) Some grounds are terraces → True (As, All terraces are lawns, All lawns are grounds, No ground is a field. so, Some grounds are terraces true)

Thus, Both conclusions (I) and (II) follow.

Hence, the correct answer is "Option 2".

Q71. Answer: (b) 34.25

Shortcut Trick

Discarding 34 (which is the original average) doesn't change the average of the remaining 49 numbers.

Discarding 22, which is (34 − 22) = 12 less than the average, creates a surplus.

This surplus is distributed over the remaining (50 − 2) = 48 numbers.

Increase in Average = 12 ÷ 48 = 0.25.

New Average = 34 + 0.25 = 34.25.

Therefore The correct answer is 34.25.

Alternate Method

Given: The average of 50 numbers is 34. Two numbers, 34 and 22, are discarded.

Formula Used: Average = Sum of all observations ÷ Total number of observations

=> Initial Total Sum = Average × Count = 34 × 50 = 1700

=> Sum of discarded numbers = 34 + 22 = 56

=> New Sum after discarding = 1700 − 56 = 1644

=> New Count of numbers = 50 − 2 = 48

=> New Average = New Sum ÷ New Count = 1644 ÷ 48

=> New Average = 34.25

Therefore The correct answer is 34.25.

Additional Information

Property of Average when removing values

If the discarded number is greater than the average, the new average decreases. If the discarded number is smaller than the average, the new average increases.

Uniform Change

If every number in a set is increased or decreased by a constant k, the average also increases or decreases by k respectively.

Weighted Average

When two groups with averages A1 and A2 and counts n1 and n2 are combined, the combined average is (n1A1 + n2A2) ÷ (n1 + n2).

Q72. Answer: (b) 114513

Shortcut Trick

Work backward from the last divisor: HCF = 57.

Divisor3 = 57 × 8 = 456 (Second number)

Divisor2 = 456 × 5 + 57 = 2337 (First number)

Divisor1 = 2337 × 1 + 456 = 2793

LCM = (2337 × 2793) ÷ 57 = 114513.

Therefore The correct answer is 114513.

Alternate Method

Given: Quotients = 1, 5, 8; Last divisor (HCF) = 57.

Formula Used: Dividend = (Divisor × Quotient) + Remainder

=> Third Dividend = (57 × 8) + 0 = 456

=> Second Dividend = (456 × 5) + 57 = 2280 + 57 = 2337

=> First Dividend = (2337 × 1) + 456 = 2793

=> Two numbers are 2337 and 2793.

=> LCM = (Product of numbers) ÷ HCF

=> LCM = (2337 × 2793) ÷ 57

=> LCM = 41 × 2793 = 114513

Therefore The correct answer is 114513.

Additional Information

HCF by Long Division

This method involves successive division where the remainder of one step becomes the divisor for the next step until the remainder is zero.

Relation between HCF and LCM

For any two numbers a and b: a × b = HCF(a, b) × LCM(a, b). This is used to find one value when the other three are known.

Properties of HCF

The HCF of two or more numbers is the greatest number that divides each of them exactly without leaving a remainder.

Q73. Answer: (d) Smooth muscle fibres, slow and sustained involuntary contraction

The correct answer is option 4,Key Points

• Muscle fibres in the gastrointestinal tract are primarily smooth muscle fibres, which are essential for its function.

• Smooth muscle fibres are responsible for slow, sustained, and involuntary contractions that facilitate processes like peristalsis.

• These fibres are non-striated, meaning they lack the organized sarcomere structure seen in skeletal and cardiac muscles.
• Smooth muscle contractions are regulated by the autonomic nervous system, making them involuntary.
• They play a crucial role in the movement of food, absorption, and digestion within the gastrointestinal tract.
Additional Information
• Skeletal Muscle Fibres
• Skeletal muscles are striated and under voluntary control.
• They are responsible for movement and posture through rapid and forceful contractions.
• They are attached to bones via tendons.
• Cardiac Muscle Fibres
• Cardiac muscles are striated and involuntary.
• They are exclusively found in the heart and are responsible for rhythmic contractions.
• Contractions are regulated by pacemaker cells and the autonomic nervous system.
• Peristalsis
• A wave-like motion produced by smooth muscle contractions in the gastrointestinal tract.
• It helps in propelling food and digestive contents forward.
• Autonomic Nervous System (ANS)
• ANS controls involuntary functions in the body, including smooth muscle activity.
• The ANS consists of the sympathetic and parasympathetic divisions.

Q74. Answer: (a) 120

Shortcut Trick
Given Diameter = 44 cm → Radius (r) = 22 cm.
Curved Surface Area (CSA) = πrl = 2684π => 22 × l = 2684.
Slant height (l) = 2684 ÷ 22 = 122 cm.
Apply Pythagoras Theorem: $h = \sqrt{(l^2 - r^2)} = \sqrt{(122^2 - 22^2)} = \sqrt{((122 - 22)(122 + 22))}$.
$h = \sqrt{(100 \times 144)} = 10 \times 12 = 120$ cm.
Therefore The correct answer is 120 cm.
Alternate Method
Given:
Curved Surface Area (CSA) = 2684π cm^2
Diameter = 44 cm => Radius (r) = 44 ÷ 2 = 22 cm
Formula Used:
Curved Surface Area of cone = πrl
Slant height (l) = $\sqrt{(h^2 + r^2)}$
Calculations:
=> π × 22 × l = 2684π
=> 22 × l = 2684
=> l = 2684 ÷ 22 = 122 cm
=> $l^2 = r^2 + h^2$
=> $122^2 = 22^2 + h^2$
=> $h^2 = 122^2 - 22^2$
=> $h^2 = (122 - 22)(122 + 22)$ [Using $a^2 - b^2 = (a-b)(a+b)$]
=> $h^2 = 100 \times 144$
=> $h = \sqrt{(14400)} = 120$ cm
Therefore The correct answer is 120 cm.
Additional Information
Total Surface Area of Cone
It includes the curved area and the circular base area: TSA = πr(l + r).
Volume of Cone
The space occupied by the cone: $V = (1/3)\pi r^2 h$.
Slant Height Relation
In a right circular cone, the height, radius, and slant height form a right-angled triangle: $l^2 = h^2 + r^2$.

Q75. Answer: (a) Rs. 20 lakh crore

The correct answer is Rs. 20 lakh crore.

• The central government of India announced a Rs. 20 lakh crore economic package to combat the economic impacts of the COVID-19 pandemic.

• This package was part of the Aatmanirbhar Bharat Abhiyan (Self-Reliant India Campaign), announced by PM Narendra Modi in May 2020.

• The package aimed to provide relief to various sectors, including agriculture, small businesses, and migrant laborers, while boosting the economy.

• The initiative combined fiscal measures, monetary policy reforms, and liquidity support to address the short-term and long-term challenges posed by the pandemic.

• It accounted for approximately 10% of India's GDP at the time, marking one of the largest stimulus packages announced globally.

• Aatmanirbhar Bharat Abhiyan:

• It is a campaign aimed at making India self-reliant by promoting local manufacturing, reducing import dependence, and boosting exports.

• The campaign focuses on five key pillars: economy, infrastructure, technology-driven systems, demography, and demand.

• It emphasized the "Vocal for Local" initiative to support domestic industries.

• Breakdown of the Rs. 20 lakh crore package:

• A large part of the package consisted of liquidity measures introduced by the Reserve Bank of India (RBI).

• Direct fiscal support from the government included cash transfers, free food grains distribution, and tax relief measures.

• Special provisions were made for micro, small, and medium enterprises (MSMEs), agriculture, and healthcare infrastructure.

• COVID-19 and Economic Challenges:

• The pandemic disrupted supply chains, reduced consumer demand, and led to massive job losses, especially in the informal sector.

• The lockdown measures imposed to contain the virus significantly impacted industries such as hospitality, tourism, and retail.

• Global Comparison:

• The Rs. 20 lakh crore package was among the largest globally in terms of GDP proportion, alongside stimulus measures by countries like the US and Japan.

• While India's package focused on long-term structural reforms, other nations prioritized direct fiscal transfers and immediate financial support.

Q76. Answer: (b) Subtropical Desert

The correct answer is option 2,

The correct answer is Subtropical Desert.

Key Points

• The Thar Desert, also known as the Great Indian Desert, is classified as a subtropical desert due to its location and climatic conditions.

• It is located in the northwestern part of India and eastern Pakistan, covering an area of approximately 200,000 square kilometers.

• Subtropical deserts are characterized by high temperatures during the day, cooler nights, and low annual rainfall.

• The Thar Desert receives an annual rainfall of less than 200 mm, making it one of the driest regions in India.

• Its climate is influenced by the Hadley cell circulation, which creates stable, dry air masses over subtropical latitudes.

Additional Information

• Subtropical Desert Characteristics

• Subtropical deserts are located between 20° and 30° north or south latitude.

• They have hot summers with temperatures often exceeding 40°C.

• Rainfall is scarce, often occurring in brief, sporadic showers.

• Vegetation is sparse and adapted to drought conditions.

• Geography of the Thar Desert

• It covers parts of Rajasthan, Gujarat, Punjab, and Haryana in India and Sindh in Pakistan.

• The desert is home to unique sand dune formations and salt marshes like the Rann of Kutch.

• Flora and Fauna

• Vegetation includes drought-resistant shrubs, grasses, and acacia trees.

• Wildlife includes species like desert foxes, camels, and the endangered Great Indian Bustard.

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• Human Settlement
• The Thar Desert is one of the most densely populated deserts in the world.
• Communities rely on agriculture, animal husbandry, and tourism for their livelihoods.

Q77. Answer: (a) 1000

The logic followed here is:
Thus, the missing term in the series is 1000.
Hence, the correct answer is "Option 1";

Q78. Answer: (d) Rs. 1,507

Shortcut Trick
Use the CP to MP ratio formula: CP ÷ MP = (100 − D%) ÷ (100 + P%).
Given: Cost Price (CP) = Rs. 605, Discount (D) = 45%, Profit (P) = 37%.
Ratio = (100 − 45) ÷ (100 + 37) = 55 ÷ 137.
Since 55 units = Rs. 605, then 1 unit = Rs. 605 ÷ 55 = Rs. 11.
Marked Price (MP) = 137 × 11 = Rs. 1,507.
Therefore The correct answer is Rs. 1,507.
Alternate Method
Formulas: SP = CP × (100 + P%) ÷ 100 | MP = (SP × 100) ÷ (100 − D%)
=> Step 1: Calculate Selling Price (SP) = 605 × (100 + 37) ÷ 100 = 605 × 1.37 = Rs. 828.85.
=> Step 2: Calculate Marked Price (MP) using SP = MP × (100 − D%) ÷ 100.
=> 828.85 = MP × (55 ÷ 100).
=> MP = (828.85 × 100) ÷ 55 = 82885 ÷ 55.
=> MP = Rs. 1,507.
Therefore The correct answer is Rs. 1,507.
Additional Information
Relation between CP and MP
The direct relation CP/MP = (100 − Discount%)/(100 + Profit%) is derived by equating the two expressions for SP.
Marked Price & Discount
Marked Price is the price printed on the label, while Discount is always calculated on the MP to arrive at the SP.

Q79. Answer: (c) 179,138

Shortcut Trick
Let the Cost Price for A be x.
Successive multiplier: x × (100 − 60)% × (100 + 25)% = 89,569.
x × 0.40 × 1.25 = 89,569.
x × 0.5 = 89,569 => x = 89,569 ÷ 0.5 = 179,138.
Therefore The correct answer is Rs. 179,138.
Alternate Method
Given → Loss of A = 60%, Profit of B = 25%, Final Price (C) = Rs. 89,569.
Formulas: SP = CP × (100 ± Gain/Loss)% ÷ 100.
=> Let Cost Price for A = CP_A.
=> SP for A (which is CP for B) = CP_A × (40 ÷ 100) = 0.4CP_A.
=> SP for B (which is CP for C) = 0.4CP_A × (125 ÷ 100).
=> 89,569 = 0.4CP_A × 1.25.
=> 89,569 = 0.5CP_A.
=> CP_A = 89,569 × 2 = 179,138.
Therefore The correct answer is Rs. 179,138.
Additional Information
Chain Rule in Profit and Loss
When an article is passed through multiple hands, the final price is the product of initial price and successive change multipliers: Final = Initial × (100±r1)% × (100±r2)%.
Effective Percentage Change

For two successive changes of x% and y%, the net change is [x + y + (xy ÷ 100)]%. Here, −60 + 25 + (−60 × 25 ÷ 100) = −35 − 15 = −50% net loss.

Q80. Answer: (a) 7

Given series:

(Left) 1 5 & 3 * $ 4 @ % 2 7 # 9 ^ # ? 6 8 (Right)

Solution:

If all the symbols are dropped from the series,

The numbers in the series are: 1, 5, 3, 4, 2, 7, 9, 6, 8.

The fourth number from the right is 7.

Hence, the correct answer is "Option 1".

Q81. Answer: (a) Varnam

The correct answer is Varnam.

Key Points

• Purvang and Uttarang are two integral sections of a Varnam, a fundamental compositional form in Carnatic music.

• The Purvang (first section) typically consists of the Pallavi, Anupallavi, and Muktayi Swaras, while the Uttarang (second section) includes the Charanam and Charana Swaras.

• Varnam serves as an introductory piece in Carnatic music concerts and is used for both performance and practice.

• It is designed to showcase the raga's essence through a combination of melodic and rhythmic elements.

• Varnams are critical for improving a musician's mastery of raga alapana, swara singing, and rhythm.

Additional Information

• Varnam in Carnatic Music

• It is an important compositional form in Carnatic music with both lyrical and swara-based segments.

• There are two types of Varnams: Tana Varnam (focused on swaras) and Pada Varnam (focused on lyrical content).

• It serves as a warm-up for vocalists and instrumentalists due to its complexity and extensive range of notes.

• Pallavi, Anupallavi, and Charanam

• Pallavi: The main thematic line of the composition, repeated throughout.

• Anupallavi: A short stanza that complements the Pallavi, often elaborating on its theme.

• Charanam: The concluding section that provides variations and deeper explorations of the raga.

• Role of Swaras in Varnam

• Swara patterns in Varnam are used for strengthening control over rhythm and melody.

• Muktayi Swaras and Charana Swaras are key segments that demonstrate the raga's nuances.

• Carnatic Music Structure

• Carnatic music is deeply rooted in ragas (melodic frameworks) and talas (rhythmic cycles).

• Compositions like Varnams, Kritis, and Tillanas serve as the foundation for its performance repertoire.

Q82. Answer: (c) 9 km/hr

Shortcut Trick

Total time difference = 6 hours (more) + 3 hours (less) = 9 hours.

When speed is doubled (1 → 2), time taken becomes half (2 → 1).

Ratio of Abhay's time: 2 : 1. Difference = 1 unit.

1 unit = 9 hours => Original time (2 units) = 18 hours.

Abhay's initial speed = 162 km ÷ 18 hours = 9 km/hr.

Therefore The correct answer is 9 km/hr.

Alternate Method

Given: Distance = 162 km, Time1 = Time_(Sameer) + 6, Time2 = Time_(Sameer) − 3.

Formula Used: Speed = Distance ÷ Time

=> Let Abhay's initial speed be x km/hr.

=> Time1 − Time2 = 9 hours

=> (162 ÷ x) − (162 ÷ 2x) = 9

=> (324 − 162) ÷ 2x = 9

=> 162 ÷ 2x = 9

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=> 81 ÷ x = 9

=> x = 9 km/hr

Therefore The correct answer is 9 km/hr.

Additional Information

Speed-Time Relationship

When distance is constant, Speed is inversely proportional to Time (S1/S2 = T2/T1).

Average Speed

For two equal distances with speeds x and y, Average Speed = 2xy ÷ (x + y).

Relative Speed

In the same direction, subtract speeds (u − v). In the opposite direction, add speeds (u + v).

Q83. Answer: (a) 2500-1800 BCE

The correct answer is 2500-1800 BCE.

Key Points

• The Indus Valley Civilization (IVC) is one of the world's earliest urban civilizations, flourishing during the Bronze Age (circa 2500-1800 BCE).

• It was located in the northwestern regions of South Asia, primarily in modern-day India and Pakistan.

• The civilization is known for its advanced urban planning, including grid-pattern cities, drainage systems, and standardized weights and measures.

• Major urban centers of the IVC include Harappa, Mohenjo-Daro, Dholavira, and Lothal.

• The decline of the civilization is believed to have been caused by factors such as climate change, river shifts, and possibly invasions.

Additional Information

• Urban Features: Cities like Mohenjo-Daro and Harappa featured advanced urban layouts with well-planned streets, public baths, and granaries.

• Trade and Economy: The Indus people were skilled traders, and evidence suggests they engaged in long-distance trade with Mesopotamia and Central Asia.

• Script: The civilization used an script comprising pictographic symbols, often inscribed on seals.

• Artefacts: Artefacts such as the “Dancing Girl” bronze statue and the “Priest-King” sculpture highlight their artistic and cultural achievements.

• Decline: The decline of the IVC around 1800 BCE is linked to environmental factors, including changes in river systems (e.g., drying of the Saraswati River).

Q84. Answer: (d) Sister's son's wife father

A is				
Symbol	•	–	x	÷
Meaning	Son	Sister	Wife	Father
of B				

Given Expression: E ÷ F x G + H – K

E ÷ F: E is the father of F.

This confirms E is male.

F x G: F is the wife of G.

This confirms F is female and G is male.

G + H: G is the son of H.

This confirms G is male. H is a parent of G.

H – K: H is the sister of K.

This confirms H is female. Since H is G's parent and K's sister, H is the mother of G.

According to the given information Family Tree Representation:

Thus, E is the Sister's son's wife father of K.

Hence, the correct answer is "Option 4"

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Q85. Answer: (b) 275

Shortcut Trick

Effective Rate of Interest for Compound Interest (CI) for 2 years = 4 + 4 + (4 × 4)/100 = 8.16%

Effective Rate of Interest for Simple Interest (SI) for 2 years = 4 × 2 = 8%

Given, 8.16% of Principal = Rs. 280.5

=> 1% = 280.5 ÷ 8.16 = 34.375

=> Simple Interest (8%) = 34.375 × 8 = Rs. 275

Therefore The correct answer is Rs. 275.

Alternate Method

Given:

Rate of interest (R) = 4% per annum

Time period (T) = 2 years

Compound Interest (CI) = Rs. 280.5

Formula Used:

CI = P[(1 + R/100)^T − 1]

SI = (P × R × T) ÷ 100

Calculations:

=> 280.5 = P[(1 + 4/100)² − 1]

=> 280.5 = P[(1 + 1/25)² − 1]

=> 280.5 = P[(26/25)² − 1]

=> 280.5 = P[676/625 − 1]

=> 280.5 = P[(676 − 625) ÷ 625]

=> 280.5 = P[51 ÷ 625]

=> P = (280.5 × 625) ÷ 51

=> P = 5.5 × 625 = Rs. 3437.5

Now, calculating Simple Interest:

=> SI = (3437.5 × 4 × 2) ÷ 100

=> SI = (3437.5 × 8) ÷ 100

=> SI = 27500 ÷ 100 = Rs. 275

Therefore The correct answer is Rs. 275.

Additional Information

Relation between CI and SI for 2 years

For a period of 2 years, the relation is given by: CI/SI = (2 + R/100) ÷ 2 or CI = SI(1 + R/200).

Difference between CI and SI

The difference (D) for 2 years is D = P(R/100)². For 3 years, D = P(R/100)² × (3 + R/100).

Effective Rate Method

For 2 years at R%, the effective CI rate is (2R + R²/100)% and the effective SI rate is (2R)%.

Q86. Answer: (a) Reserve Bank of India

The correct answer is option 1,

The correct answer is Reserve Bank of India.

Key Points

• The Reserve Bank of India (RBI), as the central bank of India, regularly conducts dollar-rupee swap auctions to manage liquidity and stabilize currency fluctuations.

• In February 2025, RBI announced a $10 billion three-year dollar-rupee swap auction aimed at enhancing liquidity management and providing stability to the foreign exchange market.

• Dollar-rupee swap auctions are a tool used by RBI to infuse liquidity in the Indian banking system by exchanging US dollars for Indian rupees with a promise to reverse the transaction in the future.

• Such auctions are critical for addressing short-term liquidity mismatches while ensuring the smooth functioning of financial markets.

• The move aligns with RBI's proactive measures to manage external risks and stabilize the value of the Indian rupee amidst global economic uncertainties.

Additional Information

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• Dollar-Rupee Swap Explained:

• A dollar-rupee swap is a financial transaction where RBI buys US dollars from banks in exchange for rupees with an agreement to reverse the transaction at a future date.

• This mechanism helps in managing both liquidity and foreign exchange reserves efficiently.

• Significance of Forex Swap Auctions:

• Forex swaps ensure adequate liquidity in the banking system and reduce volatility in currency markets.

• They play a crucial role in balancing the demand and supply of foreign currency in the domestic market.

• RBI's Role in Monetary Policy:

• RBI uses various monetary tools such as repo rate, reverse repo rate, and forex swaps to regulate liquidity and inflation.

• Forex swaps complement these tools by addressing external sector risks and stabilizing exchange rates.

• Impact on Financial Markets:

• Such auctions are closely monitored by investors and banks as they impact liquidity, interest rates, and currency exchange rates.

• The announcement of a $10 billion swap auction reflects RBI's commitment to maintaining financial stability amidst global economic challenges.

Q87. Answer: (c) 91

Given:

Karan's rank from the top = 28th.

Karan's rank from the bottom = 64th.

Total persons = (Rank from Top) + (Rank from Bottom) - 1

= 28 + 64 - 1

= 92 - 1

= 91

Thus, there are 91 students in the class.

Hence, the correct answer is "Option 3".

Q88. Answer: (d) 77,000

Shortcut Trick

Monthly Savings = 13,000 − (4,000 + 2,000) = Rs. 7,000

Total months in a year = 12

Birthday month savings spent = 0

Annual Savings = 7,000 × (12 − 1) = 7,000 × 11 = Rs. 77,000

Therefore The correct answer is Rs. 77,000.

Alternate Method

Given: Monthly Salary = Rs. 13,000; Rent = Rs. 4,000; Bills = Rs. 2,000

Formula: Savings = Income − Expenditure

=> Total Monthly Expenditure = 4,000 + 2,000 = Rs. 6,000

=> Monthly Savings = 13,000 − 6,000 = Rs. 7,000

=> Total Annual Savings (excluding 1 month) = Monthly Savings × 11

=> Annual Savings = 7,000 × 11 = Rs. 77,000

Therefore The correct answer is Rs. 77,000.

Additional Information

Percentage Savings

It is calculated as (Total Savings ÷ Total Income) × 100. This helps in understanding the savings rate of an individual.

Successive Changes

If income increases by x% and expenditure increases by y%, the new savings are calculated using the base change method.

Average Monthly Savings

It is the total annual savings divided by 12, regardless of variations in individual months.

Q89. Answer: (a) 1681

Shortcut Trick

Identify the value of (a + b) directly from the given information.

Given a + b = 41.

To find $(a + b)^2$, simply square the value of 41.

$41^2 = 1681$.

Therefore The correct answer is 1681.

Alternate Method

Given:

$a + b = 41$

$a - b = 38$

Formula Used:

$(x)^2 = x \times x$

Calculations:

$\Rightarrow a + b = 41$

$\Rightarrow (a + b)^2 = (41)^2$

$\Rightarrow (a + b)^2 = 41 \times 41$

$\Rightarrow (a + b)^2 = 1681$

Therefore The correct answer is 1681.

Additional Information

Square of a Sum

The expansion of the square of a binomial is given by $(a + b)^2 = a^2 + 2ab + b^2$.

Square of a Difference

The expansion of the square of a difference is given by $(a - b)^2 = a^2 - 2ab + b^2$.

Relation between Squares

The relationship between the two identities is $(a + b)^2 - (a - b)^2 = 4ab$.

Q90. Answer: (d) 2 km towards the north

Given:

Mr. O starts from Point U and drives 1 km towards the west.

He then takes a left turn, drives 2 km, turns right and drives 3 km. He then takes a left turn and drives 4 km.

He then takes a left turn, drives 4 km. He takes a final left turn, drives 4 km and stops at Point V.

Thus, Mr. O has to drive 2km north to reach point U.

Hence, the correct answer is "Option 4".

Q91. Answer: (b) Two

Given: Seven boxes, A, B, C, D, E, F and Y, are kept one over the other. The lowermost box is numbered 1 and the topmost is numbered 7.

1) Only D is kept above F.

2) Only three boxes are kept between D and A.

7	**D**
6	F
5	
4	
3	A
2	
1	

3) Only B is kept below E.

7	**D**
6	F
5	
4	

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3	A
2	E
1	B

4) Y is not kept immediately above A.

7	**D**
6	F
5	Y
4	C
3	A
2	E
1	B

Therefore, Two boxes are kept between C and B.

Hence, the correct answer is "Option 2".

Q92. Answer: (a) Brahmi

The correct answer is Brahmi.

Key Points

• Brahmi script was the primary script used for inscriptions during the Mauryan period, particularly in Emperor Ashoka's edicts.

• It is one of the oldest writing systems in South Asia and is considered the ancestor of most modern Indian scripts, including Devanagari, Tamil, and Bengali.

• Brahmi was written from left to right, unlike Kharosthi, which was written from right to left.

• The inscriptions in Brahmi during the Mauryan period were often used to disseminate Ashoka’s messages of Dhamma (moral and ethical principles).

• Deciphered by James Prinsep in 1837, the Brahmi script unlocked critical insights into ancient Indian history and culture.

Additional Information

• Kharosthi Script

• This was another ancient script used in the northwestern parts of the Indian subcontinent, written from right to left.

• It was influenced by the Aramaic script and primarily used in the Gandhara region (modern-day Pakistan and Afghanistan).

• Ashokan Edicts

• The Mauryan Emperor Ashoka issued a series of inscriptions on rocks and pillars to propagate his policy of Dhamma.

• These edicts were written in Brahmi, Kharosthi, and other regional scripts depending on the location of the inscriptions.

• Grantha Script

• Grantha script was used in South India, primarily for writing Sanskrit texts.

• It developed much later and is not associated with the Mauryan period.

• Pali and Prakrit

• Pali and Prakrit are ancient languages, not scripts, often used in Buddhist and Jain texts.

• Many of Ashoka's inscriptions were written in Prakrit, but they used the Brahmi script.

• James Prinsep’s Contribution

• James Prinsep was a British scholar who deciphered the Brahmi and Kharosthi scripts in 1837.

• His work enabled historians to understand the Mauryan inscriptions and reconstruct India's ancient history.

Q93. Answer: (c) 289:672

Shortcut Trick

Ratio of sides BD : BA = 17 : (17 + 14) = 17 : 31.

Ratio of areas $\Delta BDE : \Delta BAC = 17^2 : 31^2 = 289 : 961$.

Area of trapezium ADEC = 961 − 289 = 672.

Required ratio = 289 : 672.

Therefore The correct answer is 289:672.

Alternate Method

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Given: BD = 17 cm, AD = 14 cm, and DE || AC.

Formula Used: Ratio of areas of similar triangles = (Ratio of corresponding sides)².

=> AB = BD + AD = 17 + 14 = 31 cm.

=> In ΔBDE and ΔBAC, angle B is common and angle BDE = angle BAC (corresponding angles as DE || AC).

=> ΔBDE ~ ΔBAC by AA similarity criterion.

=> Area(ΔBDE) / Area(ΔBAC) = (BD / BA)² = (17 / 31)² = 289 / 961.

=> Let Area(ΔBDE) = 289 units and Area(ΔBAC) = 961 units.

Q94. Answer: (d) 25

Shortcut Trick

Relative speed (same direction) = 30 − 21 = 9 kmph = 9 × 5/18 = 2.5 m/s.

Total distance (L_P + L_Q) = Speed × Time = 2.5 × (6.5 × 60) = 2.5 × 390 = 975 m.

Length of Train P (L_P) = 975 − 296 = 679 m.

Relative speed (opposite direction) = 30 + 96 = 126 kmph = 126 × 5/18 = 35 m/s.

Time to cross R = (L_P + L_R) ÷ Relative speed = (679 + 196) ÷ 35 = 875 ÷ 35 = 25 seconds.

Therefore The correct answer is 25 seconds.

Alternate Method

Given: Speed P = 30 kmph, Speed Q = 21 kmph, Length Q = 296 m, Time 1 = 6.5 min, Speed R = 96 kmph, Length R = 196 m.

Formula Used: Time = (L1 + L2) ÷ Relative Speed; kmph to m/s = × 5/18.

=> Relative Speed P & Q = (30 − 21) × 5/18 = 9 × 5/18 = 2.5 m/s.

=> Total Length (L_P + L_Q) = Speed × Time = 2.5 × (6.5 × 60) = 975 m.

=> Length of P (L_P) = 975 − 296 = 679 m.

=> Relative Speed P & R = (30 + 96) × 5/18 = 126 × 5/18 = 35 m/s.

=> Total Distance for P & R = 679 + 196 = 875 m.

=> Required Time = 875 ÷ 35 = 25 seconds.

Therefore The correct answer is 25 seconds.

Additional Information

Relative Speed Concepts

When two objects move in the same direction, relative speed is (S1 − S2). When they move in opposite directions, relative speed is (S1 + S2).

Crossing Length Rule

When a train crosses another train, bridge, or platform, the total distance covered is always the sum of their lengths (L1 + L2).

Unit Conversion

To convert speed from km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Q95. Answer: (b) West Bengal

The correct answer is West Bengal.

Key Points

• West Bengal shares its international boundary with three countries: Bangladesh, Bhutan, and Nepal.

• Bangladesh lies to the east of West Bengal, with a boundary spanning approximately 2,217 km.

• Nepal is located to the northwest of West Bengal, sharing a short border with the Darjeeling district.

• Bhutan lies to the north of West Bengal, adjacent to the districts of Alipurduar and Jalpaiguri.

• Due to its strategic location, West Bengal serves as a vital gateway for trade and cultural exchange with these neighboring countries.

Additional Information

• Bangladesh: West Bengal shares its largest international boundary with Bangladesh, which has significant historical, cultural, and trade ties with India.

• Bhutan: A landlocked Himalayan kingdom, Bhutan maintains strong diplomatic and economic relations with India, with West Bengal acting as a key access route.

• Nepal: West Bengal's Siliguri Corridor (also known as the 'Chicken’s Neck') provides a vital connection between Nepal and the rest of India.

• Darjeeling and Kalimpong: These areas of West Bengal are strategically significant due to their proximity to Nepal and Bhutan.

• Connectivity: The state’s geographical position makes it a critical hub for international trade and transit routes with South Asia.

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Q96. Answer: (b) (72, 56, 47)

The logic followed here is:

Logic: 1st number - 16 = 2nd number.

2nd number - 9 = 3rd number.

For, (57, 41, 32)

=> First to Second: 57 - 16 = 41.

=> Second to Third: 41 - 9 = 32.

For, (65, 49, 40)

=> First to Second: 65 - 16 = 49.

=> Second to Third: 49 - 9 = 40.

Option 1) (59, 85, 74)

=> First to Second: 59 - 16 = 43. (Given Second number is 85, 85 ≠ 43)

Here, logic not followed.

Option 2) (72, 56, 47)

=> First to Second: 72 - 16 = 56. (Matches)

=> Second to Third: 56 - 9 = 47. (Matches)

Here, logic followed.

Option 3) (96, 80, 61)

=> First to Second: 96 - 16 = 80. (Matches)

=> Second to Third: 80 - 9 = 71. (Given Third number is 61, 61 ≠ 71)

Here, logic not followed.

Option 4) (51, 35, 16)

=> First to Second: 51 - 16 = 35. (Matches)

=> Second to Third: 35 - 9 = 26. (Given Third number is 16, 16 ≠ 26)

Here, logic not followed.

Hence, the correct answer is "Option 2".

Q97. Answer: (b) Hyderabad

The correct answer is option 2,

Key Points

• The princely state of Hyderabad was ruled by the Nizam, the hereditary monarch whose official title was "Nizam-ul-Mulk".

• The Nizam of Hyderabad was the supreme authority in the state, enjoying full autonomy under British paramountcy.

• The term 'Sar'khas estate' referred to the personal domain or private estate of the Nizam, which was directly administered by him.

• Hyderabad was one of the largest and wealthiest princely states in India, known for its vast resources, including rich diamond mines.

• After India’s independence in 1947, the state of Hyderabad was annexed into the Indian Union in 1948 through Operation Polo, ending the Nizam's rule.

Additional Information

• Princely States in British India:

• India had around 565 princely states before independence, ruled by local monarchs under British suzerainty.

• These states had internal autonomy but were bound to the British Crown in matters of defense and foreign policy.

• Nizam of Hyderabad:

• The title "Nizam" was first adopted by Asaf Jah I, the founder of the Asaf Jahi dynasty, in the early 18th century.

• The Nizams were known for their wealth, cultural patronage, and administration.

• Operation Polo:

• A military operation launched by the Indian government in September 1948 to annex Hyderabad into India.

• It marked the end of princely rule in Hyderabad and integrated it into the Indian Union.

• Economic Importance of Hyderabad:

• Hyderabad was a wealthy state, with significant revenue from agriculture, trade, and industries like textiles and diamonds.

• The city of Hyderabad was a major center for culture, education, and architecture in southern India.

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Q98. Answer: (a) It holds essential firmware required for booting the system

The correct answer is option 1,

Key Points

• ROM (Read-Only Memory) is a type of non-volatile memory that retains its contents even when the computer is powered off.

• The primary function of ROM is to store essential firmware, such as the BIOS, which is required for booting the system.

• Firmware stored in ROM is hardcoded during manufacturing and is not meant to be modified by regular users.

• Unlike RAM, ROM does not lose its data when the system is shut down, making it critical for initializing hardware components during startup.

• ROM is used in various devices, including computers, smartphones, embedded systems, and gaming consoles, to provide stable and reliable operation.

Additional Information

• BIOS (Basic Input/Output System)

• The BIOS is firmware stored in ROM and is responsible for initializing hardware during the boot process.

• It provides an interface for the operating system to interact with the hardware components.

• Modern systems may use UEFI (Unified Extensible Firmware Interface) instead of traditional BIOS.

• Non-Volatile Memory

• Non-volatile memory retains data even when the power supply is cut off.

• Examples include ROM, EEPROM, and Flash memory.

• It is essential for storing permanent data or firmware.

• EEPROM (Electrically Erasable Programmable Read-Only Memory)

• EEPROM is a type of ROM that can be erased and reprogrammed electrically.

• It allows limited updates to firmware or settings stored on the device.

• RAM vs ROM

• RAM (Random Access Memory) is volatile and used for temporary data storage during system processing.

• ROM is non-volatile and stores permanent data, such as firmware.

• Both are essential for system operation but serve different purposes.

Q99. Answer: (d) Year 1858

The correct answer is Year 1858.

Key Points

• The title of Governor-General of India was replaced by the title of Viceroy of India in 1858, following the Government of India Act 1858.

• This change marked the formal transfer of authority from the East India Company to the British Crown, after the events of the Revolt of 1857 (also called the First War of Independence).

• The Viceroy acted as the direct representative of the British Crown and was responsible for administering India on behalf of the monarch.

• Lord Canning, who was the last Governor-General of India, became the first Viceroy of India in 1858.

• The Government of India Act 1858 was a significant legislative change that centralized governance under the Crown, ending the dual control system of the East India Company.

Additional Information

• Revolt of 1857:

• Also known as India's First War of Independence, it was a major uprising against the rule of the British East India Company.

• The revolt led to significant political changes, including the abolition of the East India Company's rule in India.

• Government of India Act 1858:

• This act abolished the East India Company's authority and transferred governance directly to the British Crown.

• A new office called the "Secretary of State for India" was created to oversee Indian administration from Britain.

• Role of the Viceroy:

• The Viceroy served as the head of the colonial administration in India.

• He was responsible for implementing policies and laws on behalf of the British Crown.

• Lord Canning:

• He was the last Governor-General of India under the East India Company.

• He became the first Viceroy of India after the Government of India Act 1858 came into effect.

• Significance of 1858:

• The transition symbolized the beginning of the British Crown's direct rule over India, which lasted until Indian independence in 1947.

Q100. Answer: (c) Krishna

The correct answer is Krishna.

Key Points

• The Krishna River originates in the Western Ghats near Mahabaleshwar in the state of Maharashtra, India.

• It is one of the longest rivers in India, with a total length of approximately 1,400 km, flowing through Maharashtra, Karnataka, Telangana, and Andhra Pradesh.

• The river flows eastward and empties into the Bay of Bengal, supporting agriculture and irrigation along its course.

• Key tributaries of the Krishna River include the Tungabhadra, Koyna, and Bhima Rivers, among others.

• The Krishna River basin is known for its fertile lands and is a vital water source for millions in South India.

Additional Information

• Western Ghats

• The Western Ghats are a mountain range that runs parallel to the western coast of India, known for their biodiversity and ecological significance.

• They are a UNESCO World Heritage Site and a major source of many important rivers in peninsular India.

• Major Rivers Originating in the Western Ghats:

• Besides Krishna, other important rivers originating from the Western Ghats include the Godavari, Kaveri, and Periyar.

• These rivers are crucial for irrigation, drinking water, and hydroelectric power generation in the southern states of India.

• Significance of Krishna River:

• The Krishna River is essential for agriculture, providing irrigation to large areas in the Deccan Plateau.

• It supports several major dams and irrigation projects, such as the Nagarjuna Sagar Dam and the Srisailam Dam.

• Ecological Concerns:

• Like many rivers in India, the Krishna River faces challenges such as pollution, over-extraction of water, and reduced flow due to climate change.

• Efforts are being made to conserve and sustainably manage the river and its basin.

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