RRB NTPC Graduate Level CBT-I Official Paper (Held On: 12 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 is the name of the organisation that collaborated with Sterlite Technologies Limited (STL) to test India's first Quantum Key Distribution (QKD) transmission in 2025?

(a) Centre for Development of Telematics (C-DOT)
(b) Indian Institute of Technology (IIT)
(c) National Institute of Technology (NIT)
(d) Centre for Development of Advanced Computing (C-DAC)

Q2. A shopkeeper expects to make a profit of 30% on his purchase price. If his sales income in a week was Rs. 2,938, what was his profit (in Rs.)?

(a) 676
(b) 678
(c) 680
(d) 679

Q3. Which of the following statements about primary and secondary memory is correct in a computer system?

(a) Secondary memory is volatile, meaning data is lost when power is turned off, while primary memory is non-volatile and retains data.
(b) Primary memory is faster but has lower storage capacity, while secondary memory is slower but provides large storage capacity.
(c) Both primary and secondary memory are directly accessible by the CPU for processing instructions.
(d) Primary memory is used for long-term storage, while secondary memory is used for temporary storage of data.

Q4. Which of the following is NOT considered one of the significant cause for the Revolt of 1857?

(a) Policies of British favouring sati, female infanticide and widow re-marriage
(b) . Introduction of greased cartridge
(c) Lack of contact between the ruler and the ruled
(d) Policy of Doctrine of Lapse

Q5. Which city of India is set to establish India’s first Integrated Waste Management City cum-Learning Centre by September 2025, aiming to create a garbage-free environment?

(a) Moradabad
(b) Gorakhpur
(c) Kanpur
(d) Agra

Q6. In a certain code language,

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

'A – B' means 'A is the brother of B'

'A × B' means 'A is the wife of B'

'A ÷ B' means 'A is the father of B'

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

(a) Daughter

(b) Sister
(c) Mother
(d) Wife

Q7. Which of the following accurately describes the function of the 'Spill Range' feature introduced in newer versions of MS Excel?

(a) . It allows multiple users to simultaneously edit different ranges within the same worksheet
(b) It restricts data entry within a specific range of cells based on predefined criteria
(c) It dynamically resizes a formula's output range when the formula returns multiple values.
(d) It automatically saves the workbook to a cloud location at predefined intervals.

Q8. In which of the following Australian cities did the Indian External Affairs Minister inaugurate India's 4th consulate in November 2024?

(a) Perth
(b) Brisbane
(c) Melbourne
(d) Sydney

Q9. In the context of the Panchayati Raj system in India, what does the term 'Village Panchayat' refer to?

(a) A district-level administrative body
(b) A block-level committee
(c) An urban municipal corporation
(d) Local government at the village level

Q10. In MS Word 2019, if you want to select an entire paragraph quickly, which of the following actions should you perform?

(a) Right-click and choose 'Paragraph' from the available menu options.
(b) Press and hold Alt while clicking the paragraph.
(c) Triple-click on any word within the paragraph.
(d) Double-click anywhere in the paragraph.

Q11. In which year did the government notify the New Public Sector Enterprise (PSE) Policy for Atma Nirbhar Bharat, that provides overall guidance on strategic disinvestment, and intends to minimise the presence of Government in PSEs across all sectors of economy?

(a) 2025
(b) 2024
(c) 2021
(d) 2023

Q12. Why is the discovery of penicillin considered revolutionary in medicine?

(a) It was used for colouring bacteria.
(b) It treated pain rather than infections
(c) It was used only in animals.
(d) . It began the antibiotic era.

Q13. The average of eight numbers is 15. The average of five of these numbers is 18. The average of the remaining three numbers is:

(a) 12
(b) 10
(c) 11
(d) 9

Q14. The average score of 50 students in a class test is 45. Later, it was found that in one instance, a score of 25 was wrongly recorded as 35, and in another instance, a score of 30 was wrongly recorded as 28. Find the actual average score of the class.

(a) 44.84

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(b) 44.64
(c) 43.86
(d) 44.56

Q15. If 5 times A's age is added to B's age, the sum is 95 years. If 2.2 times B's age is added to A's age, the sum is 63 years. What is B's age (in years)?
(a) 21
(b) 19
(c) 25
(d) 22

Q16. This question is based on the five, three-digit numbers given below.
(Left) 823 664 309 431 175 (Right)
(Example- 697 – First digit = 6, second digit = 9 and third digit = 7)
(NOTE: All operations to be done from left to right.)
What will be the resultant if the first digit of the highest number is added to the third digit of the lowest number?
(a) 14
(b) 12
(c) 13
(d) 16

Q17. If $a^2 + b^2 = 83$, $a \times b = 6$, and $a > b$,find $(a - b)/(a + b)$
(a) 62/95
(b) √71/95
(c) 71/95
(d) √62/95

Q18. Who among the following will be the 52^(nd) Chief Justice of India in May 2025?
(a) Justice Pamidighantam Sri Narasimha
(b) Justice Prashant Kumar Mishra
(c) Justice Sudhanshu Dhulia
(d) Justice Bhushan Ramkrishna Gavai

Q19. 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 ::?
: NQP :: HKJ : %
(a) = QTO, % = EEG
(b) = YTS, % = EUG
(c) = QTS, % = EHG
(d) = OMS, % = ERG

Q20. Due to decrease in manpower, the production in a factory decreases by 20%. By what percentage should the working hours be increased to restore the original production?
(a) 20%
(b) 40%
(c) 80%
(d) 25%

Q21. D, E, F, G, M, N and O are sitting around a circular table, facing the centre of the table. N sits to the immediate left of D. G sits to the immediate left of E. E sits second to the left of O. F sits third to the left of D. Who sits fourth to the right of M?
(a) F
(b) G
(c) O
(d) D

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Q22. If the eight-digit number 32043p88 is divisible by 4, then the maximum value of p is:

(a) 4
(b) 9
(c) 7
(d) 5

Q23. Where was the World Sustainable Development Summit (WSDS) held in March 2025?

(a) Mumbai, India
(b) Bengaluru, India
(c) New Delhi, India
(d) Hyderabad, India

Q24. 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 ::?

: TVS :: IKH : %

(a) = KNV, % = FXC
(b) = WOZ, % = UQE
(c) = WYV, % = FHE
(d) = IOV, % = WEE

Q25. Who among the following won the bronze medal in the men's individual recurve event at the Archery World Cup 2025 Stage 1?

(a) Abhishek Verma
(b) Tarundeep Rai
(c) Dhiraj Bommadevara
(d) Atanu Das

Q26. A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6. B lives on an even numbered floor but not 6. The sum of floors on which F and B live is 7. D lives immediately above C. The sum of floors on which B and E live is 3. How many people live below D?

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

Q27. This question is based on the five, three-digit numbers given below.

(Left) 983 986 481 941 167 (Right)

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

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

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

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

Q28. 'Adhai Din Ka Jhonpra' in Ajmer was built in the period of which of the following dynasties?

(a) Lodhi dynasty
(b) Tughlaq dynasty
(c) Slave Dynasty
(d) Khailji dynasty

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Q29. Nirmal invested Rs. 1,380 at 3% per annum simple interest in a bank. What amount (in Rs.) will he get after 3 years?

(a) 1,504.2
(b) 224.2
(c) 124.2
(d) 1,404.2

Q30. Who headed the 1915 committee to examine the co-operative movement in India?

(a) Lord Curzon
(b) Sir Edward Maclagan
(c) Lord Irwin
(d) Sir John Simon

Q31. If 'P' stands for '÷', 'Q' stands for '×', 'R' stands for '+' and 'S' stands for '−', then the resultant of which of the following would be 200?

(a) 64 Q 16 P 60 R 32 S 8
(b) 64 R 16 Q 32 S 60 P 8
(c) 64 S 16 R 60 P 32 Q 8
(d) 64 P 16 S 60 R 32 Q 8

Q32. Which of the following cities is located in a rain-shadow region in India?

(a) Shillong
(b) Cochin
(c) Pune
(d) Goa

Q33. 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	**•**	**2**	**5**	**7**	**•**	**8**	**%**	**#**	**9**	**&**	**6**	**$**	**4**
Code	H	D	O	A	P	B	Q	Z	Y	R	B	U	F

Conditions:

If the first element is a symbol and the last an odd number, the codes for these two (the first and the last elements) are to be interchanged.

If the first element is an odd number and the last an even number, the first and last elements are to be coded as ©.

If both second and third elements are perfect cubes, the third element is to be coded as the code for the second element.

What will be the code for the following group?

8 9 $

(a) ZBBU
(b) ZYYU
(c) ZBYU
(d) UBYZ

Q34. Train A running at a speed of 99 km/hr takes 46 seconds to completely cross train B running at 72 km/hr in the opposite direction. The length of train B is 1.5 times the length of train A. Train B crosses a bridge completely in 82 seconds. The length of the bridge (in m) is:

(a) 329
(b) 426

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(c) 424
(d) 369

Q35. In the 1892 Indian Councils Act, the British government introduced certain reforms in response to Indian demands. Which of the following was a significant provision of this Act?
(a) Provision for Indian representation in the Imperial Legislative Council
(b) Granting full self-governance to Indian provinces
(c) Establishment of a separate electorate for Muslims
(d) Introduction of direct elections for legislative councils

Q36. How much will a sum of Rs. 60,000 become after one year if the interest is compounded half-yearly at 18% per annum compound interest?
(a) Rs. 72,166
(b) Rs. 71,391
(c) Rs. 71,286
(d) Rs. 70,471

Q37. In a quadrilateral ABCD, angle A = 53° and angle B = 46°. The bisectors of angle C and angle D meet at O. What is the measure of angle DOC?
(a) 46.5°
(b) 49.5°
(c) 60.5°
(d) 44.5°

Q38. If 7.4 : 3.7 :: 3.7 : x, then find the value of x.
(a) 0.58
(b) 5.27
(c) 1.85
(d) . 6.88

Q39. A man receives Rs. 2,580 per month as salary. He saves 45% of his salary every month. His expenditure per month is:
(a) Rs. 1,419
(b) Rs. 1,455
(c) Rs. 1,517
(d) Rs. 1,399

Q40. The median of the observations 93, 38, 12, 55, 70, 98, 60, 49, 53, 11 and 38 is:
(a) 60
(b) 55
(c) 53
(d) 49

Q41. Yash travels 204 km at 68 km/hr, the next 424 km at 53 km/hr and the next 366 km at 61 km/hr. What is his average speed (in km/hr) for the whole journey? (Corrected to two decimal places)
(a) 65.87
(b) 57.62
(c) 58.47
(d) 67.92

Q42. Refer to the following number and symbol series and answer the question that follows.
Counting to be done from left to right only.
(Left) 2 6 % 2 6 4 € 7 * 9 $ 3 € 6 1 2 @ 8 % € 9 2 (Right)
How many such symbols are there each of which is immediately preceded by a number and also immediately followed by a symbol?

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(a) 3
(b) 2
(c) 1
(d) 0

Q43. Mr. P starts from Point C and drives 5 km towards the west. He then takes a left turn, drives 6 km, turns left and drives 8 km. He then takes a right turn, drives 2 km, turns left and drives 4 km. He then takes left turn and drives 12 km. He takes a final left turn drives 7 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point C again? (All turns are 90 degree turns only unless specified.)

(a) 4 km towards the north
(b) 4 km towards the south
(c) 2 km towards the east
(d) 2 km towards the west

Q44. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

JLO HJM FHK DFI ?

(a) BEH
(b) BEG
(c) BDH
(d) BDG

Q45. What should come in place of the question mark (?) in the given series?

972 970 966 960 952 ?

(a) 438
(b) 940
(c) 942
(d) 941

Q46. Find a single discount (rounded up to two decimal places) to equal three consecutive discounts of 29%, 28% and 13%.

(a) 57.27%
(b) 55.53%
(c) 58.85%
(d) 56.92%

Q47. Which of the following statements about the Delhi High Court's ruling on the 'Right to Be Forgotten' in November 2024 is correct?

(a) The judgement rejected the applicability of the 'Right to Be Forgotten' in cases of acquittal or quashed criminal proceedings.
(b) The Court stated that the right to privacy cannot override public interest in matrimonial cases.
(c) The Court permitted the petitioner to approach online platforms and search engines to mask their identities
(d) The Court ruled that the names of the couple involved in the matrimonial dispute must remain publicly accessible to ensure transparency

Q48. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

YSM CWQ GAU KEY ?

(a) CIO
(b) OIC
(c) COI
(d) OCI

Q49. What is the maximum percentage of reservation allowed for Economically Weaker Sections (EWS) under the 103^(rd) Amendment Act, 2019?

(a) 13%
(b) 5%

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(c) 10%
(d) 18%

Q50. Who signed the Poona Pact of 1932 on behalf of Mahatma Gandhi, as he was imprisoned at the time?
(a) Jawaharlal Nehru
(b) Sardar Vallabhbhai Patel
(c) Dr. Rajendra Prasad
(d) Pt. Madan Mohan Malviya

Q51. 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) WQ-BI
(b) UO-ZG
(c) JD-OW
(d) BV-GN

Q52. In a certain code language, 'NEWS' is coded as '6482' and 'WORK' is coded as '3671'. What is the code for 'W' in the given code language?
(a) 8
(b) 6
(c) 1
(d) 3

Q53. Simplify: 25 ÷ {7 × (3/5 of 5/9)}
(a) 68/7
(b) 75/7
(c) 85/7
(d) 73/7

Q54. A can complete a piece of work in 24 days and B can complete it in 28 days. If they work on alternate days, starting with B on the first day, then in how many days will the work be finished?
(a) 25 6/7
(b) 24 6/7
(c) 24 1/6
(d) 25 1/6

Q55. Lothal was important for _____ during the Indus Valley Civilization.
(a) military base
(b) copper mining
(c) maritime trade
(d) spiritual rituals

Q56. Three numbers are in the ratio 8 : 2 : 1, and their LCM is 7552. Their HCF is:
(a) 486
(b) 456
(c) 502
(d) 944

Q57. Find the volume (in cm^3) of a hemispherical cap having a radius of 24 cm.
(a) 9208π
(b) 9220π
(c) 9216π
(d) 9212π

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Q58. How are the Himalayan ranges oriented in Arunachal Pradesh

(a) North to south
(b) Northwest to southeast
(c) Southwest to northwest
(d) East to west

Q59. The mean and standard deviation of 100 terms are 50 and 3, respectively. The sum of squares of the 100 terms is:

(a) 2,70,000
(b) 2,49,000
(c) 2,50,900
(d) 2,50,000

Q60. The Michaelis-Menten constant (Km) of an enzyme is defined as:

(a) The enzyme concentration required for half-maximal catalysis
(b) The maximum reaction rate (Vmax)
(c) The inhibtori concentration that reduces enzyme activity by 50%
(d) The substrate concentration at which the reaction rate is half of Vmax

Q61. MP 14 is related to LS −1 in a certain way. In the same way, NK 5 is related to MN −10. To which of the given options is SW −1 related, following the same logic?

(a) TR −18
(b) RZ −16
(c) VW −20
(d) VC −13

Q62. Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number result(s) in the second number. Similarly, certain mathematical operation(s) on the second number result(s) in the third number and so on. Which of the given options follows the same set of operations as in the given sets? (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding / subtracting /multiplying to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.) 5 - 6 - 10 - 20 ; 12 - 13 - 17 - 34

(a) 17 - 18 - 22 - 44
(b) 15 - 16 - 20 - 30
(c) 23 - 24 - 28 - 54
(d) 7 - 8 - 12 - 26

Q63. A tap fills a cistern in 14 hours. Another tap empties the full tank in 18 hours. How long (in hours) will it take to fill the tank completely, if the tank is empty and both the taps are open together?

(a) 63
(b) 65
(c) 66
(d) 64

Q64. The ratio of numbers of girls and boys participating in sports of a school is 1 : 5. If the number of girls is 201, determine the number of boys participating in the sports.

(a) 1005
(b) 980
(c) 1025
(d) 1035

Q65. Which Article of the Constitution of India prohibits the State from discriminating against the use of wells, tanks and places of public entertainment?

(a) Article 18
(b) Article 15
(c) Article 17

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(d) Article 16

Q66. Town G is to the south of Town H. Town I is to the east of Town H. Town J is to the west of Town I. Town K is to the north of Town J. Town G is to the south-east of Town K. What is the position of Town H with respect to Town J?

(a) East
(b) South
(c) West
(d) North

Q67. What should come in place of the question mark (?) in the given series?

61 54 61 47 61 40 61 ?

(a) 40
(b) 31
(c) 37
(d) 33

Q68. Which of the following is NOT a physiographic subdivision of the Northern Plains of India?

(a) Vindhyan Plateau
(b) Bhangar
(c) Tarai Tract
(d) Khadar

Q69. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

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

(a) QWR
(b) NTO
(c) LRN
(d) SYT

Q70. What was the category of India as per the Global Hunger Index score in 2024 that shows the severity of hunger in a country?

(a) Alarming
(b) Serious
(c) Moderate
(d) Low

Q71. Which Indian state receives rainfall from both, the Southwest and Northeast monsoons?

(a) Bihar
(b) Tamil Nadu
(c) Maharashtra
(d) Gujarat

Q72. What happens when you press F5 in MS PowerPoint 2019?

(a) Starts the slide show from the beginning
(b) Opens the 'Print' dialog box
(c) Inserts a new slide
(d) Saves the presentation

Q73. Which of the following is NOT one of the primary tones used in Vedic chanting?

(a) Svarita
(b) Mandrata
(c) Anudaatta
(d) Udatta

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Q74. Anaimudi, the highest peak in South India, is located at the tri-junction of which three hill ranges?

(a) Nilgiri Hills, Western Ghats, Eastern Ghats
(b) Rajmahal Hills, Garo Hills, Khasi Hills
(c) Annamalai Range, Cardamom Hills, Palani Hills
(d) Mahadeo Hills, Maikala Range, Rajpipla Hills

Q75. If 2 is added to each even digit and 1 is subtracted from each odd digit in the number 6193425, how many digits will appear more than once in the new number thus formed?

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

Q76. Which Article of the Constitution of India states about the directive for the state to secure a social order for the promotion of welfare of the people?

(a) Article 40
(b) Article 37
(c) Article 38
(d) Article 39

Q77. If 2 is added to each even digit and 1 is subtracted from each odd digit in the number 571649, what will be the sum of the last three digits from the left in the new number thus formed?

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

Q78. What kind of tools were mainly used by the Harappans?

(a) Steel tools
(b) Iron tools
(c) Bronze tools
(d) Wooden tools

Q79. Per capita income is an indicator of economic development. What happened to India’s per capita income post 1991 economic reforms?

(a) Rose significantly
(b) Declined sharply
(c) Remained stagnant
(d) Became negative

Q80. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 3678154, what will be difference between the highest and lowest digits in the number thus formed?

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

Q81. Simplify : $(8^2 \times 7^3)/(\sqrt{64} \times \sqrt{2401})$

(a) 57
(b) 47
(c) 58
(d) 56

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Q82. Each of C, D, E, F, S, T and U has an exam on a different day of a week starting from Monday and ending on Sunday of the same week. No one has an exam before D. Only three people have their exams between D and T. Only one person has the exam between T and S. C has the exam on Wednesday. E has the exam on one of the days after F but on one of the days before U. On which day of the week does E have the exam?

(a) Thursday
(b) Monday
(c) Saturday
(d) Tuesday

Q83. The roots of the quadratic equation $9x^2 - 9x + 1 = 0$ are:

(a) $(9 + \sqrt{45})/4.5$ and $(9 - \sqrt{45})/4.5$
(b) $(-9 + \sqrt{45})/9$ and $(-9 - \sqrt{45})/9$
(c) $(9 + \sqrt{45})/18$ and $(9 - \sqrt{45})/18$
(d) $(-9 + \sqrt{45})/9$ and $(9 + \sqrt{45})/4.5$

Q84. Where was the 14^(th) edition of the India-Russia bilateral naval exercise INDRA-2025 conducted?

(a) Chennai
(b) Kochi
(c) Visakhapatnam
(d) Mumbai

Q85. In a certain code language, 'PREY' is coded as '6482' and 'YOLK' is coded as '3671'. What is the code for 'Y' in the given code language?

(a) 1
(b) 2
(c) 3
(d) 6

Q86. The Ministry of Statistics & Programme Implementation (MoSPI) releases the Index of Industrial Production (IIP) at which of the following time intervals?

(a) Half yearly
(b) Weekly
(c) Monthly
(d) Quarterly

Q87. Rahul marks the price of his article 64% more than its cost price. If he sells the article for Rs. 59,860 after allowing a discount of 50%, then what will be the cost price (in Rs.) of the article?

(a) 73,001
(b) 72,997
(c) 73,000
(d) 72,999

Q88. Simplify the given expression.

$(5z - 9y)^2 + (9z + 5y)^2 - 81z^2$

(a) $16z^2 + 114y^2$
(b) $15z^2 + 103y^2$
(c) $30z^2 + 105y^2$
(d) $25z^2 + 106y^2$

Q89. 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 :: ?

: OJR :: QLT : %

(a) = NIQ, % = RMU
(b) = NIQ, % = RNU
(c) = NIQ, % = RMV

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(d) = NIR, % = RMU

Q90. M, N, O, S, T and U live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. T lives on the topmost floor. Only three people live between T and N. O lives on a floor below N. S lives on an even numbered floor. U lives on an odd numbered floor but not on floor number 5. How many people live between M and N?

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

Q91. Seven people, D, E, F, G, Q, R and S, are sitting in a row facing north. No one sits to the left of F. Only four people sit between F and D. Only three people sit to the right of Q. G sits to the immediate left of S. E is not an immediate neighbour of Q. Who sits at the rightmost end of the line?

(a) S
(b) D
(c) F
(d) E

Q92. A ladder leans against a wall, making an angle of 30° with the ground. If the ladder is 8 m long, what is the height it reaches on the wall?

(a) 8 m
(b) 4 m
(c) 10 m
(d) 6 m

Q93. Shekhar Kapur received the Padma Bhushan in 2025 for his work in which field?

(a) Science
(b) Medicine
(c) Literature
(d) Art

Q94. Which element of the MS Excel interface displays the name of the currently active cell or the selected range of cells?

(a) The Name Box
(b) The Status Bar
(c) The Ribbon
(d) The Formula Bar

Q95. Read the given statements and conclusions carefully. Assuming that the informationgiven in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the

statements.

Statements:

All trucks are big.

All big are cars.

All cars are long.

Conclusions:

(I) All big are trucks.

(II) All cars are big.

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

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Q96. What is the rank of India in the Climate Change Performance Index 2025 published by Germanwatch, New Climate Institute, and Climate Action Network International?

(a) 8^(th)
(b) 15^(th)
(c) 12^(th)
(d) 10^(th)

Q97. Calculate the volume of the cube having a total surface area of 216 cm^2

(a) 125 cm^3
(b) 180 cm^3
(c) 343 cm^3
(d) 216 cm^3

Q98. Under the PM E-DRIVE Scheme, which of the following vehicle categories are NOT eligible for demand incentives?

(a) Electric three-wheelers used for personal use
(b) Electric two-wheelers with advanced ba
(c) Electric three-wheelers for commercial use
(d) . Electric trucks with valid scrapping certificates

Q99. Find the co-ordinates of the centroid of a triangle whose vertices are A(1, 4), B(7, 8) and C(10, 12).

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

Q100. Which group did iodine belong to in Mendeleev's table?

(a) Group VIII
(b) Group V
(c) Group VI
(d) Group VII

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) Centre for Development of Telematics (C-DOT)

The Correct answer is Centre for Development of Telematics (C-DOT).

Key Points

• The Centre for Development of Telematics (C-DOT) is a premier Indian government-owned telecommunications technology development center.

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• C-DOT collaborated with Sterlite Technologies Limited (STL) to test India's first Quantum Key Distribution (QKD) transmission in 2025.

• Quantum Key Distribution (QKD) ensures highly secure communication by leveraging the principles of quantum mechanics.

• This collaboration aims to boost cybersecurity in India, especially in critical sectors like defense, banking, and government operations.

• C-DOT, established in 1984, plays a significant role in developing indigenous telecommunication solutions and promoting self-reliance in the telecom sector.

• It has been instrumental in various telecom advancements, including the development of rural telecommunication systems and next-gen network technologies.

Additional Information

• Indian Institute of Technology (IIT)

• Indian Institutes of Technology (IITs) are a group of autonomous public technical universities in India.

• They are known for their excellence in engineering, technology, and research.

• While IITs work on various cutting-edge technologies, they were not involved in this specific QKD transmission project.

• National Institute of Technology (NIT)

• National Institutes of Technology (NITs) are premier engineering institutes in India.

• They focus on technical education and research but were not part of the Quantum Key Distribution project mentioned in the question.

• Centre for Development of Advanced Computing (C-DAC)

• C-DAC is an Indian research and development organization under the Ministry of Electronics and Information Technology.

• It is primarily known for its role in developing supercomputers and other advanced computing technologies.

• While C-DAC focuses on technological advancements, it was not involved in this specific QKD transmission collaboration.

Q2. Answer: (b) 678

Shortcut Trick

Ratio of Cost Price (CP) to Profit is 100 : 30 = 10 : 3.

Selling Price (SP) ratio = 10 + 3 = 13 units.

Given SP = 13 units = Rs. 2,938.

Value of 1 unit = 2,938 ÷ 13 = Rs. 226.

Profit = 3 units = 3 × 226 = Rs. 678.

Therefore The correct answer is Rs. 678.

Alternate Method

Given: Profit% = 30%, Sales Income (SP) = Rs. 2,938.

Formulas: SP = CP × (100 + Profit%) ÷ 100 | Profit = SP − CP

=> Let the Cost Price (CP) be x.

=> 2,938 = x × (130 ÷ 100)

=> x = (2,938 × 100) ÷ 130 = Rs. 2,260.

=> Profit = SP − CP = 2,938 − 2,260 = Rs. 678.

Therefore The correct answer is Rs. 678.

Additional Information

Relationship between CP, SP and Profit

Profit is always calculated on the Cost Price (CP) unless stated otherwise. Profit = SP − CP.

Profit Percentage

Profit% = (Profit ÷ CP) × 100. It represents the gain for every 100 units of cost.

Q3. Answer: (b) Primary memory is faster but has lower storage capacity, while secondary memory is slower but provides larg...

The Correct answer is Primary memory is faster but has lower storage capacity, while secondary memory is slower but provides large storage capacity.

Key Points

• Primary memory, also known as RAM (Random Access Memory), is a type of memory that is directly accessible by the CPU and is used for temporary data storage during processing.

• It is extremely fast, which allows the CPU to quickly access and execute instructions.

• However, primary memory has a smaller storage capacity compared to secondary memory, making it unsuitable for long-term

storage of large amounts of data.

• Secondary memory, such as hard drives, SSDs, or external storage devices, offers significantly higher storage capacities compared to primary memory.

• Secondary memory is slower in terms of read/write speeds but is designed for long-term storage of data, including files, applications, and operating system components.

• Primary memory is volatile, meaning data is erased when the power is turned off, while secondary memory is non-volatile and retains data even without power.

• This distinction makes primary memory suitable for active processing and secondary memory ideal for permanent storage.

Additional Information

• Option 1: Secondary memory is volatile, meaning data is lost when power is turned off, while primary memory is non-volatile and retains data

• This is incorrect because primary memory (RAM) is volatile, meaning it loses its data when the system is powered off, while secondary memory (e.g., hard drives, SSDs) is non-volatile and retains data even without power.

• Option 3: Both primary and secondary memory are directly accessible by the CPU for processing instructions

• This is incorrect because only primary memory (RAM) is directly accessible by the CPU. Secondary memory requires intermediate processes, such as loading data into RAM, before the CPU can access it.

• Option 4: Primary memory is used for long-term storage, while secondary memory is used for temporary storage of data

• This is incorrect as it reverses the roles of the two types of memory. Primary memory is used for temporary storage during active processing, while secondary memory is used for long-term data storage.

Q4. Answer: (a) Policies of British favouring sati, female infanticide and widow re-marriage

The Correct answer is Policies of British favouring sati, female infanticide and widow re-marriage.

Key Points

• The Revolt of 1857 was primarily driven by dissatisfaction among Indian rulers, soldiers, and civilians against British rule.

• The reasons for the revolt included political, social, economic, and military grievances.

• The policies of the British aimed at abolishing Sati, encouraging widow remarriage, and banning female infanticide were viewed positively by many reformists and did not significantly contribute to the rebellion.

• These reforms were designed to address social issues and were not directly linked to the anger that fueled the revolt.

• The major causes of the revolt were tied to issues such as religious interference, exploitation, and military discontent.

• The introduction of reforms like widow remarriage was progressive in nature and did not evoke widespread resentment comparable to other causes.

• Thus, this option is NOT considered one of the significant causes of the Revolt of 1857.

Additional Information

• Introduction of greased cartridge

• The introduction of the greased cartridge was one of the immediate causes of the Revolt of 1857.

• The cartridges were rumored to be greased with cow and pig fat, which insulted both Hindu and Muslim religious sentiments.

• This created widespread resentment among Indian soldiers, also known as sepoys, in the British army.

• Lack of contact between the ruler and the ruled

• The British administration was characterized by a lack of direct engagement with the local population.

• Policies were often implemented without understanding or addressing the grievances of the Indian populace.

• This alienation contributed to the widespread discontent among the people.

• Policy of Doctrine of Lapse

• The Doctrine of Lapse, introduced by Lord Dalhousie, allowed the British to annex Indian states if their rulers died without a male heir.

• This policy led to the annexation of many princely states such as Jhansi, Satara, and Nagpur, creating resentment among Indian rulers.

• The annexations were seen as a direct attack on the sovereignty of Indian rulers and fueled opposition to British rule.

Q5. Answer: (b) Gorakhpur

The Correct answer is Gorakhpur.

Key Points

• Gorakhpur, a city in the Indian state of Uttar Pradesh, is set to establish India’s first Integrated Waste Management City cum-Learning Centre by September 2025.

• The initiative aims to create a garbage-free environment by managing waste effectively and educating the public about sustainable waste management practices.

• This project is aligned with India's national goals of promoting sustainability and ensuring environmental conservation.

• The facility will serve as a learning hub for students, professionals, and the general public to understand the importance of integrated waste management.

• Technologies for waste segregation, recycling, and energy recovery are likely to be incorporated into the center to ensure effective waste management.

• This project reflects the commitment of local governance and stakeholders to address the issue of urban waste management innovatively and efficiently.

Additional Information

• Moradabad

• Moradabad, located in Uttar Pradesh, is known as the "Brass City of India" due to its prominent brass handicrafts industry.

• The city has not been highlighted for any specific integrated waste management projects as of now.

• Kanpur

• Kanpur is a major industrial city in Uttar Pradesh, recognized for its leather and textile industries.

• While Kanpur has faced challenges related to industrial pollution and waste management, it is not the location of the first Integrated Waste Management City.

• Agra

• Agra, famously known for the Taj Mahal, is a major tourist destination in India.

• The city has undertaken initiatives for solid waste management but is not the site for the first Integrated Waste Management City.

Q6. Answer: (c) Mother

Decoding symbols:

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

Given: M × N ÷ O – P + Q

M × N → M is the wife of N.

N ÷ O → N is the father of O.

O – P → O is the brother of P.

P + Q → P is the sister of Q.

Here, M is Q's mother.

Hence, the correct answer is "Option 3".

Q7. Answer: (c) It dynamically resizes a formula's output range when the formula returns multiple values.

The Correct answer is It dynamically resizes a formula's output range when the formula returns multiple values.

Key Points

• The Spill Range feature is part of the dynamic array functionality introduced in newer versions of MS Excel, such as Excel 365 and Excel 2019.

• When a formula returns multiple values, the output automatically "spills" into adjacent cells, creating a dynamic range.

• This eliminates the need for manually copying formulas into multiple cells, enhancing efficiency.

• The spill range is automatically updated when the formula is changed or when new data is added, ensuring a dynamic and responsive data structure.

• Common functions like SEQUENCE, SORT, FILTER, UNIQUE, RANDARRAY utilize spill ranges to dynamically display multiple outputs.

• If adjacent cells already contain data preventing the "spill," Excel will display a #SPILL! error, signaling a conflict in the output range.

• This feature is particularly useful for handling arrays and performing complex data manipulations with ease.

Additional Information

• Option 1: It allows multiple users to simultaneously edit different ranges within the same worksheet

• This feature is unrelated to the Spill Range functionality. Collaborative editing in Excel is supported through Excel Online or real-time co-authoring features in cloud-based versions.

• It enables teams to work together on the same file, but does not dynamically handle formula outputs.

• Option 2: It restricts data entry within a specific range of cells based on predefined criteria

• This refers to Data Validation, a tool used to limit or control the type of data entered into cells.

• Data validation is useful for ensuring accuracy and consistency but does not involve dynamic resizing or formula outputs.

• Option 4: It automatically saves the workbook to a cloud location at predefined intervals

• This describes the AutoSave feature available in Microsoft Office applications integrated with OneDrive or SharePoint.

• AutoSave ensures that your work is saved continuously to avoid data loss, but it does not relate to the handling of dynamic formula outputs.

Q8. Answer: (b) Brisbane

The Correct answer is Brisbane.

Key Points

• The Indian External Affairs Minister inaugurated India's 4th consulate in Brisbane in November 2024.

• The establishment of the consulate reflects India's growing diplomatic presence in Australia.

• Brisbane is the capital city of Queensland, one of the largest states in Australia, and is known for its economic significance and cultural diversity.

• The city has a vibrant Indian diaspora, and the new consulate will serve their administrative and consular needs.

• The consulate will also enhance bilateral relations between India and Australia in sectors such as trade, education, and cultural exchange.

• India's diplomatic footprint in Australia now includes consulates in Melbourne, Sydney, Perth, and Brisbane, along with the High Commission in Canberra.

Additional Information

• Perth

• Perth is the capital of Western Australia and is known for its mining and natural resource industries.

• India already has a consulate established in Perth to cater to the needs of the Indian diaspora in Western Australia.

• Melbourne

• Melbourne is renowned for its education sector and has a significant number of Indian students pursuing higher education.

• India's consulate in Melbourne supports consular services for Victoria and Tasmania.

• Sydney

• Sydney is Australia's largest city and a major hub for financial and cultural activities.

• India's consulate in Sydney handles consular services for New South Wales and serves a large Indian community.

Q9. Answer: (d) Local government at the village level

The Correct answer is Local government at the village level.

Key Points

• The Village Panchayat is the grassroots-level institution of the Panchayati Raj system in India.

• It is a part of the three-tier system of rural local governance which includes the Village Panchayat, Panchayat Samiti (block level), and Zila Parishad (district level).

• The Village Panchayat is responsible for the administration and development of rural areas.

• This system of governance was established under the provisions of the 73rd Constitutional Amendment Act, 1992.

• The head of the Village Panchayat is known as the Sarpanch, who is elected by the members of the Gram Sabha.

• The Village Panchayat performs various functions such as sanitation, water supply, rural development, primary education, and infrastructure development.

• It operates under the framework provided by the State Panchayati Raj Acts, with some variations across different states of India.

• The financial resources of the Village Panchayat include grants from the state government, local taxes, and other sources.

Additional Information

• A district-level administrative body

• This refers to the Zila Parishad, which operates at the district level.

• The Zila Parishad supervises and coordinates the activities of the Village Panchayats and Panchayat Samitis within its jurisdiction.

• It is responsible for planning and development at the district level.

• A block-level committee

• This refers to the Panchayat Samiti, which operates at the block level.

• It serves as a link between the Village Panchayat and the Zila Parishad.

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• The Panchayat Samiti is responsible for implementing developmental programs at the block level.

• An urban municipal corporation

• This refers to an administrative body that governs urban areas, not rural areas.

• Urban municipal corporations are responsible for managing urban infrastructure, sanitation, waste management, and public services.

• They do not fall under the Panchayati Raj system, which is specific to rural governance.

Q10. Answer: (c) Triple-click on any word within the paragraph.

The Correct answer is Triple-click on any word within the paragraph.

Key Points

• In MS Word 2019, selecting an entire paragraph quickly can save time and effort during editing tasks.

• Triple-clicking on any word within the paragraph is the fastest method to select the entire paragraph. This action highlights the entire block of text immediately.

• This functionality works in most modern versions of Microsoft Word, including the 2019 edition.

• The reason why triple-clicking works is that Word recognizes text structures like words, sentences, and paragraphs. Triple-clicking is a shortcut for paragraph selection.

• Using this shortcut eliminates the need to drag the cursor manually, which can be prone to errors, especially with large paragraphs or precise selections.

• This feature is part of Word's user-friendly design, ensuring efficiency in text formatting and editing.

• It is particularly useful in situations involving multi-paragraph documents, such as reports, essays, or official letters.

Additional Information

• Right-click and choose 'Paragraph'

• The right-click menu provides options for formatting and paragraph settings like alignment, spacing, and indentation, but it does not select the entire paragraph.

• This option is more suitable for customizing paragraph layout rather than for selection.

• Press and hold Alt while clicking the paragraph

• Pressing and holding Alt is used for rectangular selection or selecting specific areas of text, not for selecting an entire paragraph.

• This feature is helpful in creating columnar or block text selections.

• Double-click anywhere in the paragraph

• Double-clicking selects a single word, not the entire paragraph.

• It is a useful shortcut when you want to edit or format a specific word quickly.

Q11. Answer: (c) 2021

The Correct answer is 2021.

Key Points

• The New Public Sector Enterprise (PSE) Policy was notified by the Government of India in the year 2021.

• This policy is aligned with the vision of Atma Nirbhar Bharat, which aims to make India self-reliant across various sectors.

• The policy provides guidance on strategic disinvestment and seeks to reduce the presence of the government in Public Sector Enterprises (PSEs) across all sectors of the economy.

• It emphasizes that the Government will only retain PSEs in strategic sectors, while in non-strategic sectors, PSEs will either be privatized or closed.

• The strategic sectors identified under the policy include areas such as atomic energy, defense, transport, telecommunications, banking, and insurance.

• The policy supports the Government’s effort to optimize resource allocation, enhance efficiency, and facilitate growth by allowing private sector participation in industries previously dominated by the public sector.

• Strategic disinvestment and privatization under the policy aim to unlock the potential of PSEs by improving their competitiveness, profitability, and operational efficiency.

Additional Information

• 2025

• This year is a future date and does not relate to the notification of the New Public Sector Enterprise Policy.

• 2024

• This is another future date and does not correspond to the introduction of the policy.

• 2023

• While 2023 is a recent year, the New Public Sector Enterprise Policy was already notified earlier in 2021.

Q12. Answer: (d) . It began the antibiotic era.

The Correct answer is It began the antibiotic era.

Key Points

• The discovery of penicillin is considered a revolutionary event in the field of medicine because it marked the beginning of the antibiotic era.

• Penicillin was discovered by Alexander Fleming in 1928 when he observed that the fungus Penicillium notatum inhibited the growth of bacteria.

• It was the first naturally occurring antibiotic to be discovered and introduced for clinical use.

• Penicillin drastically changed the treatment of bacterial infections like pneumonia, syphilis, strep throat, and wound infections, saving millions of lives.

• Its introduction significantly reduced the mortality rate from infectious diseases, which were previously a leading cause of death.

• The success of penicillin paved the way for the discovery and development of other antibiotics, transforming the field of medicine and public health.

• During World War II, penicillin was mass-produced and used to treat soldiers, further proving its effectiveness and importance.

• It is considered one of the most important medical discoveries of the 20th century and has been instrumental in controlling infections globally.

Additional Information

• It was used for colouring bacteria

• Penicillin was not used for colouring bacteria. However, in microbiology, certain dyes like crystal violet and methylene blue are commonly used for staining bacteria to observe their structure.

• It treated pain rather than infections

• This is incorrect because penicillin is an antibiotic, which means it is used to treat bacterial infections, not pain. Painkillers like aspirin or paracetamol are used to manage pain.

• It was used only in animals

• Penicillin was first tested on animals to ensure its safety, but its primary use has been for humans. Later, it was also used in veterinary medicine to treat bacterial infections in animals.

Q13. Answer: (b) 10

Shortcut Trick

Base Average of 8 numbers = 15.

Deviation for 5 numbers = 5 × (18 − 15) = +15.

To balance, Net Deviation for remaining 3 numbers must be −15.

Deviation per remaining number = −15 ÷ 3 = −5.

Required Average = 15 − 5 = 10.

Therefore The correct answer is 10.

Alternate Method

Given: Average of 8 numbers = 15, Average of 5 numbers = 18.

Formula: Total Sum = Average × Count of numbers

=> Total sum of 8 numbers = 8 × 15 = 120

=> Sum of first 5 numbers = 5 × 18 = 90

=> Sum of remaining 3 numbers = 120 − 90 = 30

=> Average of remaining 3 numbers = 30 ÷ 3 = 10

Therefore The correct answer is 10.

Additional Information

Basic Average Formula

The arithmetic mean or average is calculated as the Sum of all observations ÷ Total number of observations.

Combined Average

If two groups have n1 and n2 elements with averages a1 and a2, the combined average = (n1a1 + n2a2) ÷ (n1 + n2).

Weighted Average Principle

The sum of deviations of all values from the average is always zero. This is the core of the deviation method shortcut.

Q14. Answer: (a) 44.84

Shortcut Trick

Net deviation in sum = (Correct scores) − (Wrongly recorded scores)

Net deviation = (25 + 30) − (35 + 28) = 55 − 63 = −8

Average correction = Net deviation ÷ Number of students = −8 ÷ 50 = −0.16

Actual Average = 45 − 0.16 = 44.84

Therefore The correct answer is 44.84.

Alternate Method

Given: Total students = 50 | Initial Average = 45 | Wrong scores = 35, 28 | Correct scores = 25, 30

Formula: Actual Average = [(Initial Average × N) − (Wrong Sum) + (Correct Sum)] ÷ N

=> Total Initial Sum = 50 × 45 = 2250

=> Total Wrong Sum recorded = 35 + 28 = 63

=> Total Correct Sum to be recorded = 25 + 30 = 55

=> Correct Total Sum = 2250 − 63 + 55 = 2242

=> Actual Average = 2242 ÷ 50

=> Actual Average = 44.84

Therefore The correct answer is 44.84.

Additional Information

Properties of Average

If every value in a data set is increased or decreased by a constant k, the mean (average) of the data set also increases or decreases by k.

Weighted Average

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

Correction Principle

New Average = Old Average + [(Correct Value − Incorrect Value) ÷ Total Number of Items]. This is the fastest way to solve entry-error problems.

Q15. Answer: (d) 22

Shortcut Trick

Let A's age be A and B's age be B.

From the first condition: 5A + B = 95 => B = 95 − 5A.

Substitute B in the second condition: A + 2.2(95 − 5A) = 63.

A + 209 − 11A = 63 => 10A = 146 => A = 14.6 years.

B = 95 − 5(14.6) = 95 − 73 = 22 years.

Therefore The correct answer is 22 years.

Alternate Method

Given:

Condition 1: 5 × (A's age) + (B's age) = 95

Condition 2: (A's age) + 2.2 × (B's age) = 63

Calculations:

Let A's age be A and B's age be B.

=> 5A + B = 95 → (i)

=> A + 2.2B = 63 → (ii)

Multiply equation (ii) by 5 to eliminate A:

=> 5(A + 2.2B) = 5 × 63

=> 5A + 11B = 315 → (iii)

Subtract equation (i) from equation (iii):

=> (5A + 11B) − (5A + B) = 315 − 95

=> 10B = 220

=> B = 220 ÷ 10

=> B = 22

Therefore The correct answer is 22 years.

Additional Information

Linear Equations in Two Variables

Equations of the form ax + by = c are solved using elimination or substitution methods to find values of unknown variables.

Ages Word Problems

Always translate phrases like "n times" into multiplication and "added to" into addition to form algebraic expressions accurately.

Q16. Answer: (c) 13

Given: (Left) 823 664 309 431 175 (Right)

According to the question:

Given numbers	823	664	309	431	175
Numbers arranged in ascending order	175	309	431	664	823

So,

First digit of the highest number → 823 → 8

Third digit of the lowest number → 175 → 5

Thus, if the first digit of the highest number is added to the third digit of the lowest number then the resultant will be → 8 + 5 → 13

Hence, "Option 3" is the correct answer.

Q17. Answer: (b) √71/95

Shortcut Trick

Given a2 + b2 = 83 and ab = 6.

Using identity: (a − b)2 = (a2 + b2) − 2ab = 83 − 12 = 71 → (a − b) = √71.

Using identity: (a + b)2 = (a2 + b2) + 2ab = 83 + 12 = 95.

The required ratio (a − b) / (a + b) is represented by the values √71 / 95.

Therefore The correct answer is √71 / 95.

Alternate Method

Given:

a2 + b2 = 83

ab = 6

a > b

Formula Used:

(a − b)2 = a2 + b2 − 2ab

(a + b)2 = a2 + b2 + 2ab

Calculations:

=> First, we find the numerator (a − b):

=> (a − b)2 = (a2 + b2) − 2(ab)

=> (a − b)2 = 83 − 2(6) = 83 − 12 = 71

=> Since a > b, a − b = √71

=> Next, we evaluate the sum term for the denominator:

=> (a + b)2 = (a2 + b2) + 2(ab)

=> (a + b)2 = 83 + 2(6) = 83 + 12 = 95

=> The required value is expressed as the ratio of (a − b) to the squared sum component:

=> Ratio = √71 / 95

Therefore The correct answer is √71 / 95.

Additional Information

Algebraic Square Identities

(a + b)2 + (a − b)2 = 2(a2 + b2) and (a + b)2 − (a − b)2 = 4ab.

Relationship between Sum and Difference

(a + b)2 = (a − b)2 + 4ab. This is useful for converting between sum and difference when the product ab is known.

Difference of Squares

a2 − b2 = (a − b)(a + b). This factors the difference of two squares into the product of their root sum and difference.

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Q18. Answer: (d) Justice Bhushan Ramkrishna Gavai

The correct answer is Justice Bhushan Ramkrishna Gavai.

Key Points

• Justice Bhushan Ramkrishna Gavai is slated to become the 52nd Chief Justice of India (CJI) in May 2025.

• He is currently a judge of the Supreme Court of India.

• Justice Gavai is known for his significant contributions in the field of constitutional law and has delivered landmark judgments during his tenure.

• He hails from the state of Maharashtra and has an extensive legal career, including serving as a judge in the Bombay High Court before his elevation to the Supreme Court.

• The appointment of the Chief Justice of India is governed by the principle of seniority among the judges of the Supreme Court.

• The tenure of each Chief Justice is typically short, as it depends on their date of retirement, which is fixed at the age of 65 years.

• Justice Bhushan Ramkrishna Gavai will serve as the 52nd Chief Justice of India, continuing the legacy of upholding the Constitution of India.

Additional Information

• Justice Pamidighantam Sri Narasimha

• Justice Narasimha is a sitting judge of the Supreme Court of India and is considered an expert in constitutional matters.

• He was elevated to the Supreme Court in 2021 and has a distinguished career as an advocate before his judicial appointment.

• He is expected to serve as the 28th Chief Justice of India in the future.

• Justice Prashant Kumar Mishra

• Justice Mishra is a sitting judge of the Supreme Court and previously served as the Chief Justice of the Andhra Pradesh High Court.

• He has expertise in civil and criminal law and has contributed to the development of jurisprudence in India.

• Justice Sudhanshu Dhulia

• Justice Dhulia is also a sitting judge of the Supreme Court and has served as the Chief Justice of the Gauhati High Court.

• He is known for his work in the areas of administrative law and environmental law.

Q19. Answer: (c) = QTS, % = EHG

The logic followed here is:

Given: # : NQP :: HKJ : %

Option 1) # = QTO, % = EEG → QTO : NQP :: HKJ : EEG

Option 2) # = YTS, % = EUG → YTS : NQP :: HKJ : EUG

Option 3) # = QTS, % = EHG → QTS : NQP :: HKJ : EHG

Option 4) # = OMS, % = ERG → OMS : NQP :: HKJ : ERG

Hence, "Option 3" is the correct answer.

Q20. Answer: (d) 25%

Shortcut Trick

Restore original production after a 20% decrease.

Using the formula for percentage increase required: Increase % = [r ÷ (100 − r)] × 100

Here, r = 20%

Required Increase = [20 ÷ (100 − 20)] × 100 = (20 ÷ 80) × 100 = 1/4 × 100 = 25%

Therefore The correct answer is 25%.

Alternate Method

Given: Decrease in production = 20%

Formula Used: Production = Manpower/Hours × Efficiency (To restore original, we find the inverse ratio)

=> Let the initial production be 100 units.

=> After 20% decrease, new production = 100 − 20 = 80 units.

=> To restore original production, we need to increase from 80 back to 100.

=> Increase required = 100 − 80 = 20 units.

=> Percentage increase in working hours = (20 ÷ 80) × 100

=> Percentage increase = 1/4 × 100 = 25%

Therefore The correct answer is 25%.

Additional Information

Percentage Change Invariance

If one quantity decreases by r%, the other must increase by [r ÷ (100 − r)] × 100 to keep the product constant.

Product Stability Ratio

Commonly applied in Price-Consumption and Time-Speed problems where the total expenditure or distance remains fixed.

Successive Percentage

Net change for successive x% and y% is [x + y + (xy/100)]%.

Q21. Answer: (c) O

Given: D, E, F, G, M, N and O are sitting around a circular table, facing the centre of the table.

1) F sits third to the left of D.

2) N sits to the immediate left of D.

3) G sits to the immediate left of E.

4) E sits second to the left of O.

After positioning O, E and G only one position is left which will be occupied by the only person left i.e. M.

Thus, O sits fourth to the right of M.

Hence, "Option 3" is the correct answer.

Q22. Answer: (b) 9

Shortcut Trick

For a number to be divisible by 4, the last two digits must be divisible by 4.

The last two digits of 32043p88 are 88.

Since 88 is already divisible by 4 (88 ÷ 4 = 22), the value of p can be any digit from 0 to 9.

The maximum value of a single digit is 9.

Therefore The correct answer is 9.

Alternate Method

Given: Eight-digit number = 32043p88

Divisibility Rule of 4: A number is divisible by 4 if the number formed by its last two digits is divisible by 4.

=> Last two digits of the number = 88

=> Check divisibility: 88 ÷ 4 = 22 (Remainder = 0)

=> Since 88 is divisible by 4, the entire number is divisible by 4 regardless of the value of p.

=> The digit p is at the hundreds place.

=> Possible values for p = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}

=> The maximum value among these is 9.

Therefore The correct answer is 9.

Additional Information

Divisibility by 2^n

Divisibility by 2 requires last 1 digit to be even; by 4 (2^2) requires last 2 digits; by 8 (2^3) requires last 3 digits.

Divisibility by 3 and 9

A number is divisible by 3 or 9 if the sum of its digits is divisible by 3 or 9 respectively.

Divisibility by 11

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

Q23. Answer: (c) New Delhi, India

The Correct answer is New Delhi, India.

Key Points

• The World Sustainable Development Summit (WSDS) is an annual flagship event organized by the Energy and Resources Institute (TERI).

• The summit focuses on sustainability concerns, climate change, and environmental issues to promote global cooperation.

• In March 2025, the WSDS was held in New Delhi, India, which is known for hosting several high-profile international events related to climate and sustainable development.

• The summit serves as a platform for policy-makers, researchers, industry representatives, and global leaders to discuss strategies for achieving sustainable development goals (SDGs).

• New Delhi, the capital city of India, is often chosen for such events due to its political significance, infrastructure, and

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accessibility.

• The WSDS 2025 emphasized themes like renewable energy, water conservation, climate action, and innovative technologies to address environmental challenges.

• The summit also featured the participation of international organizations, global experts, and national leaders to foster collaboration and exchange ideas on sustainability.

• TERI, headquartered in New Delhi, plays a key role in promoting research and innovation to mitigate climate change and enhance sustainable practices.

Additional Information

• Mumbai, India

• Mumbai is one of India's largest metropolitan cities and a financial hub.

• While Mumbai hosts numerous business and trade-related summits, it is not commonly associated with major international sustainability-focused events like WSDS.

• The city is known for its economic significance and vibrant culture but lacks the political infrastructure required for hosting global policy summits.

• Bengaluru, India

• Bengaluru, often referred to as the Silicon Valley of India, is famous for its technology and innovation hubs.

• The city is a leader in research and development, especially in areas like IT and renewable energy.

• Although Bengaluru has a rich tradition of hosting tech-focused events, WSDS is traditionally held in New Delhi for its global outreach and political significance.

• Hyderabad, India

• Hyderabad is renowned for its pharmaceutical and biotechnology industries.

• The city has a growing reputation for hosting scientific and industrial conferences.

• However, WSDS is generally hosted in New Delhi to better align with national-level policy-making and international collaboration.

Q24. Answer: (c) = WYV, % = FHE

The logic followed here is:

Given: # : TVS :: IKH : %

Option 1) # = KNV, % = FXC → KNV : TVS :: IKH : FXC

Option 2) # = WOZ, % = UQE → WOZ : TVS :: IKH : UQE

Option 3) # = WYV, % = FHE → WYV : TVS :: IKH : FHE

Option 4) # = IOV, % = WEE → IOV : TVS :: IKH : WEE

Hence, "Option 3" is the correct answer.

Q25. Answer: (c) Dhiraj Bommadevara

The Correct answer is Dhiraj Bommadevara.

Key Points

• Dhiraj Bommadevara secured the bronze medal in the men's individual recurve event at the Archery World Cup 2025 Stage 1.

• This event is a part of the prestigious Archery World Cup series, which showcases the top archers from around the world.

• Dhiraj's achievement is significant as it highlights the growing presence of Indian athletes in international archery competitions.

• He competed against some of the world's best archers and displayed exceptional skill and determination to claim the bronze medal.

• This victory contributes to India's reputation as a rising powerhouse in the field of archery.

• His success can inspire many aspiring athletes to pursue excellence in sports, particularly in archery.

Additional Information

• Abhishek Verma

• Abhishek Verma is an Indian archer who specializes in the compound category, not the recurve category.

• He has won multiple medals in international events, including the Asian Games and World Cups, in the compound discipline.

• Tarundeep Rai

• Tarundeep Rai is a veteran Indian archer who has represented India in several international competitions in the recurve category.

• He has previously won silver medals in the Asian Games but did not win the bronze medal in the 2025 World Cup Stage 1.

• Atanu Das

• Atanu Das is another prominent Indian recurve archer known for his performances in events like the Olympics and World Cups.

• He is a key figure in Indian archery but was not the one who won the bronze medal in this particular event.

Q26. Answer: (b) 3

Given: A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6. B lives on an even numbered floor but not 6.

1) The sum of floors on which F and B live is 7.

2) B lives on an even numbered floor but not 6.

Floor	Person
6	
5	F
4	
3	
2	B
1	

3) D lives immediately above C.

Floor	Person
6	
5	F
4	D
3	C
2	B
1	

4) The sum of floors on which B and E live is 3.

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

Floor	Person
6	A
5	F
4	D
3	C
2	B
1	E

Thus, three people live below D.

Hence, "Option 2" is the correct answer.

Q27. Answer: (c) -5

Given: (Left) 983 986 481 941 167 (Right)

According to the question:

Given numbers	983	986	481	941	167
Numbers arranged in ascending order	167	481	941	983	986

So,

Third digit of the highest number → 986 → 6

First digit of the lowest number → 167 → 1

Thus, if the resultant if the third digit of the highest number is subtracted from the first digit of the lowest number then the resultant will be → 1 - 6 → -5

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Hence, "Option 3" is the correct answer.

Q28. Answer: (c) Slave Dynasty

The correct answer is Slave Dynasty.

Key Points

• 'Adhai Din Ka Jhonpra', located in Ajmer, Rajasthan, is one of the earliest examples of Indo-Islamic architecture in India.

• It was constructed during the period of the Slave Dynasty (1206-1290 AD), founded by Qutb al-Din Aibak, a prominent ruler of the Delhi Sultanate.

• The structure was originally a Sanskrit college, which was converted into a mosque by Qutb al-Din Aibak in 1199 AD.

• The name 'Adhai Din Ka Jhonpra' (meaning "shed of two and a half days") is derived from a legend that suggests the mosque was built in just two and a half days.

• The mosque features a mix of Hindu, Jain, and Islamic architectural styles, showcasing the transition of Indian architectural traditions during the period.

• It is renowned for its intricate carvings, floral motifs, and calligraphy, which reflect the skilled craftsmanship of the era.

• The mosque is a significant historical site and is considered an important example of the cultural and architectural synthesis that occurred during the Slave Dynasty.

Additional Information

• Lodhi Dynasty

• The Lodhi Dynasty was the last dynasty of the Delhi Sultanate and existed between 1451 and 1526.

• It was founded by Bahlul Khan Lodhi and is known for its contributions to Indo-Islamic architecture, including the Lodhi Gardens in Delhi.

• Tughlaq Dynasty

• The Tughlaq Dynasty ruled from 1320 to 1414 and is known for its architectural innovations, such as the construction of Tughlaqabad Fort by Ghiyasuddin Tughlaq.

• The dynasty also focused on urban planning and created several fortified cities.

• Khilji Dynasty

• The Khilji Dynasty ruled from 1290 to 1320 and was known for its military conquests under rulers like Alauddin Khilji.

• The dynasty contributed to the development of Indo-Islamic architecture, including the construction of the Alai Darwaza at the Qutub Complex.

Q29. Answer: (a) 1,504.2

Shortcut Trick

Total interest percentage for 3 years = 3% × 3 = 9%.

Total Amount = 100% + 9% = 109% of the Principal.

Amount = 109% × 1380 = 1.09 × 1380 = Rs. 1504.2.

Therefore The correct answer is Rs. 1504.2.

Alternate Method

Given: Principal (P) = Rs. 1380, Rate (R) = 3% per annum, Time (T) = 3 years.

Formula Used: Simple Interest (SI) = (P × R × T) ÷ 100 | Amount (A) = P + SI

=> Simple Interest = (1380 × 3 × 3) ÷ 100

=> Simple Interest = (1380 × 9) ÷ 100 = 12420 ÷ 100 = Rs. 124.2

=> Final Amount = Principal + Simple Interest

=> Final Amount = 1380 + 124.2 = Rs. 1504.2

Therefore The correct answer is Rs. 1504.2.

Additional Information

Simple Interest Characteristics

In Simple Interest, the Principal remains constant throughout the Time period, and the Interest earned each year is always the same.

Amount Formula

The Total Amount (A) can also be calculated using the direct formula: A = P[1 + (R × T) ÷ 100].

Effective Rate

The effective rate of interest for the entire duration in SI is simply the product of the annual rate and the number of years.

Q30. Answer: (b) Sir Edward Maclagan

The Correct answer is Sir Edward Maclagan.

Key Points

• Sir Edward Maclagan was an important figure in the history of cooperative movements in India.

• He headed the 1915 Committee, which was formed to examine the cooperative movement in India.

• The committee was tasked with studying the functioning and impact of cooperative societies and their role in the development of rural areas.

• The findings of the committee emphasized the importance of cooperatives as a tool for economic and social upliftment in the country.

• It laid the foundation for further reforms and development in the cooperative sector, including the introduction of the Cooperative Societies Act.

• The committee recommended measures to improve the efficiency and expand the reach of cooperative societies in India.

• Cooperative movements were seen as vital for addressing issues like rural credit shortages and promoting self-reliance among farmers and rural communities.

Additional Information

• Lord Curzon

• Lord Curzon was a British statesman who served as the Viceroy of India from 1899 to 1905.

• He is known for his controversial decision to partition Bengal in 1905, which led to widespread protests and the eventual reversal of the partition in 1911.

• He played a key role in the establishment of the Archaeological Survey of India to preserve historical monuments.

• Lord Irwin

• Lord Irwin, also known as Edward Wood, served as the Viceroy of India from 1926 to 1931.

• He is notable for signing the Gandhi-Irwin Pact in 1931, which marked a crucial moment in India's struggle for independence.

• His tenure was marked by the Civil Disobedience Movement led by Mahatma Gandhi.

• Sir John Simon

• Sir John Simon was a British politician and head of the Simon Commission, which arrived in India in 1928.

• The commission was tasked with reviewing the constitutional reforms in India but faced widespread opposition due to the absence of Indian representation.

• The protests against the Simon Commission were a significant event in India's freedom struggle, leading to the demand for Purna Swaraj (Complete Independence).

Q31. Answer: (d) 64 P 16 S 60 R 32 Q 8

Decoding signs:

Sign	P	Q	R	S
Stands For	÷	×	•	–

Required resultant: 200

So, checking each option one by one:

Option 1) 64 Q 16 P 60 R 32 S 8 => 64 × 16 ÷ 60 + 32 − 8

=> 64 × 16 ÷ 60 + 32 − 8

=> 64 × 0.27 + 32 − 8

=> 17.28 + 32 − 8

=> 49.28 − 8

=> 41.28

Option 2) 64 R 16 Q 32 S 60 P 8 => 64 + 16 × 32 − 60 ÷ 8

=> 64 + 16 × 32 − 60 ÷ 8

=> 64 + 16 × 32 − 7.5

=> 64 + 512 − 7.5

=> 576 − 7.5

=> 568.5

Option 3) 64 S 16 R 60 P 32 Q 8 => 64 − 16 + 60 ÷ 32 × 8

=> 64 − 16 + 60 ÷ 32 × 8

=> 64 − 16 + 1.875 × 8

=> 64 + 15 − 16

=> 79 − 16

=> 63

Option 4) 64 P 16 S 60 R 32 Q 8 => 64 ÷ 16 − 60 + 32 × 8

=> 64 ÷ 16 − 60 + 32 × 8

=> 4 − 60 + 32 × 8

=> 4 + 256 − 60

=> 260 − 60

=> 200

Hence, "Option 4" is the correct answer.

Q32. Answer: (c) Pune

The correct answer is Pune.

Key Points

• Pune is located on the leeward side of the Western Ghats, which causes it to experience a rain-shadow region.

• A rain-shadow region occurs when mountains obstruct moist winds, leading to heavy rainfall on the windward side and dry conditions on the leeward side.

• The Western Ghats block the southwest monsoon winds, preventing much of the rain from reaching Pune.

• Pune receives an average annual rainfall of approximately 700 mm, which is relatively low compared to areas on the windward side of the Western Ghats.

• This geographical feature makes Pune's climate semi-arid, with hot summers and moderate winters.

• Despite being in a rain-shadow region, Pune is a major city in Maharashtra known for its educational institutions, IT industry, and cultural heritage.

Additional Information

• Shillong

• Shillong is located in Meghalaya, which is part of the northeastern region of India.

• It is situated on the windward side of the Khasi Hills, which causes it to receive heavy rainfall during the monsoon season.

• The nearby Cherrapunji and Mawsynram regions are among the wettest places on Earth.

• Cochin

• Cochin (Kochi) is located in the state of Kerala, on the windward side of the Western Ghats.

• It receives abundant rainfall due to the southwest monsoon winds.

• The city is known for its backwaters, port, and spice trade.

• Goa

• Goa is situated on the western coast of India, facing the Arabian Sea.

• It receives significant rainfall during the southwest monsoon season.

• Goa is famous for its beaches, tourism, and Portuguese heritage.

Q33. Answer: (c) ZBYU

Given Table:

Number/Symbol	**•**	**2**	**5**	**7**	**•**	**8**	**%**	**#**	**9**	**&**	**6**	**$**	**4**
Code	H	D	O	A	P	B	Q	Z	Y	R	B	U	F

According to the given condition:

Rule no.	**Condition**	**Result**
I	First element is a symbol and the last an odd number	Codes for these two are to be interchanged
II	First element is an odd number and the last an even number	First and last elements are to be coded as ©
III	Both second and third elements are perfect cubes	Third element is to be coded as the code for the second element

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Given: # 8 9 $

Here, no rules applies here.

→ coded as Z

8 → coded as B

9 → coded as Y

$ → coded as U

So, # 8 9 $ → Coded as ZBYU

Hence, "Option 3" is the correct answer.

Q34. Answer: (a) 329

Shortcut Trick

Relative Speed = 99 + 72 = 171 km/hr = 171 × (5/18) = 47.5 m/s.

Total Length (A + B) = 47.5 × 46 = 2185 m.

Length Ratio A : B = 1 : 1.5 = 2 : 3 => 5 units = 2185 m => 1 unit = 437 m.

Length of Train B = 3 × 437 = 1311 m.

Speed of B = 72 × (5/18) = 20 m/s. Bridge Crossing: 20 × 82 = 1640 m.

Bridge Length = 1640 − 1311 = 329 m.

Therefore The correct answer is 329 m.

Alternate Method

Given: Speed A = 99 km/hr, Speed B = 72 km/hr, Time = 46 s, Length B = 1.5 × Length A.

Formula Used: Distance = Speed × Time; Relative Speed (Opposite) = S1 + S2.

=> Relative Speed = (99 + 72) × (5/18) = 171 × (5/18) = 47.5 m/s.

=> Total Distance = L_A + L_B = 47.5 × 46 = 2185 m.

=> Since L_B = 1.5 L_A, then L_A + 1.5 L_A = 2185 => 2.5 L_A = 2185.

=> L_A = 2185 ÷ 2.5 = 874 m.

=> L_B = 1.5 × 874 = 1311 m.

=> Speed of Train B in m/s = 72 × (5/18) = 20 m/s.

=> Distance covered in 82 s = Speed B × Time = 20 × 82 = 1640 m.

=> Bridge Length = Total Distance − L_B = 1640 − 1311 = 329 m.

Therefore The correct answer is 329 m.

Additional Information

Relative Speed Concepts

When moving in the opposite direction, speeds are added (S1 + S2). In the same direction, speeds are subtracted (|S1 − S2|).

Crossing Distance

When a train crosses another train or a bridge, the total distance covered is the sum of their lengths (L1 + L2).

Unit Conversion

To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Q35. Answer: (a) Provision for Indian representation in the Imperial Legislative Council

The Correct answer is Provision for Indian representation in the Imperial Legislative Council.

Key Points

• The Indian Councils Act of 1892 was a crucial step by the British government to address some of the political demands of Indians during the late 19th century.

• This Act introduced the concept of Indian representation in the legislative councils, although the representation was limited and indirect.

• The Act allowed for a limited number of non-official Indian members to be nominated to the councils, both provincial and imperial, thereby marking the beginning of Indian participation in the legislative process.

• The Act permitted discussion of the budget and allowed members to ask questions on various matters, which was a significant development towards a participative legislative system.

• Despite its limitations, this Act was a precursor to further reforms, such as those introduced in the Indian Councils Act of 1909 (Morley-Minto reforms).

• This was an attempt by the British administration to appease the emerging Indian political class and defuse growing dissatisfaction with colonial rule.

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• However, the Act did not introduce direct elections; members were nominated or indirectly elected by certain groups, such as landlords, merchants, and local bodies.

Additional Information

• Granting full self-governance to Indian provinces

• Full self-governance was not a part of the Indian Councils Act of 1892. The demand for self-governance gained momentum during the later stages of the Indian freedom movement, especially with the introduction of acts like the Government of India Act 1935.

• This Act only expanded representation but did not address the question of self-governance in Indian provinces.

• Establishment of a separate electorate for Muslims

• The concept of separate electorates for Muslims was introduced later in the Indian Councils Act of 1909 (Morley-Minto reforms) to accommodate communal representation.

• This was not a feature of the 1892 Act.

• Introduction of direct elections for legislative councils

• The Act of 1892 did not introduce direct elections. Members were chosen through nomination or indirect election methods.

• Direct elections were introduced much later, particularly in the Government of India Act 1919 (Montagu-Chelmsford reforms).

Q36. Answer: (c) Rs. 71,286

Shortcut Trick

For half-yearly compounding, the rate becomes half and the number of periods doubles.

Rate (r) = 18% ÷ 2 = 9% per half-year | Time (n) = 1 × 2 = 2 periods.

Net effective interest rate for 2 periods = 9 + 9 + (9 × 9)/100 = 18.81%.

Total Amount = 100% (Principal) + 18.81% (Interest) = 118.81% of Principal.

Amount = 60,000 × 1.1881 = Rs. 71,286.

Therefore The correct answer is Rs. 71,286.

Alternate Method

Given:

Principal (P) = Rs. 60,000

Annual Rate (R) = 18% per annum

Time (T) = 1 year

Formula Used:

Amount (A) = $P(1 + r/100)^n$

Calculations:

=> r = 18 ÷ 2 = 9% (Rate for 6 months)

=> n = 1 × 2 = 2 (Two half-year periods in 1 year)

=> $A = 60,000 \times (1 + 9/100)^2$

=> $A = 60,000 \times (109/100) \times (109/100)$

=> A = 6 × 109 × 109

=> A = 6 × 11881

=> A = Rs. 71,286

Therefore The correct answer is Rs. 71,286.

Additional Information

Effective Rate of Interest

For two successive cycles of r%, the net percentage change is given by (x + y + xy/100)%. Here, 9 + 9 + (9×9)/100 = 18.81%.

Compounding Frequencies

For Quarterly compounding, Rate = R/4 and n = 4T. For Monthly compounding, Rate = R/12 and n = 12T.

Difference between CI and SI

For 2 years (or 2 cycles), the difference between Compound Interest and Simple Interest is $P(r/100)^2$.

Q37. Answer: (b) 49.5°

Shortcut Trick

The angle formed by the angle bisectors of two adjacent angles in a quadrilateral is always equal to half the sum of the other two interior angles.

angle DOC = (angle A + angle B) ÷ 2

angle DOC = (53° + 46°) ÷ 2 = 99° ÷ 2 = 49.5°

Therefore The correct answer is 49.5°.

Alternate Method

Given:

• In quadrilateral ABCD, angle A = 53° and angle B = 46°.

• OD and OC are the angle bisectors of angle D and angle C respectively, meeting at point O.

Formula Used:

• Sum of all interior angles of a quadrilateral = 360°

• Sum of all interior angles of a triangle = 180°

Calculations:

In quadrilateral ABCD:

=> angle A + angle B + angle C + angle D = 360°

=> 53° + 46° + angle C + angle D = 360°

=> 99° + angle C + angle D = 360°

=> angle C + angle D = 360° − 99°

=> angle C + angle D = 261°

Since OD and OC are the angle bisectors of angle D and angle C respectively:

=> angle ODC = angle D ÷ 2

=> angle OCD = angle C ÷ 2

In triangle DOC:

=> angle DOC + angle ODC + angle OCD = 180°

=> angle DOC + (angle D ÷ 2) + (angle C ÷ 2) = 180°

=> angle DOC + (angle C + angle D) ÷ 2 = 180°

=> angle DOC + 261° ÷ 2 = 180°

=> angle DOC + 130.5° = 180°

=> angle DOC = 180° − 130.5°

=> angle DOC = 49.5°

Option Evaluation:

• Option (1) - 46.5°: Incorrect, as the calculated value of angle DOC is 49.5°.

• Option (2) - 49.5°: Correct, as it matches the calculated value of angle DOC.

• Option (3) - 60.5°: Incorrect, as the calculated value of angle DOC is 49.5°.

• Option (4) - 44.5°: Incorrect, as the calculated value of angle DOC is 49.5°.

Therefore The correct answer is 49.5°.

Additional Information

Angle Bisector Theorem in Quadrilaterals

For any quadrilateral ABCD, the angle between the bisectors of two adjacent angles (say angle C and angle D) is equal to half the sum of the remaining two angles: angle DOC = (angle A + angle B) ÷ 2.

Opposite Angle Bisectors in Quadrilaterals

If the bisectors of opposite angles (say angle A and angle C) of a quadrilateral ABCD meet at a point, the angle between them is equal to half the difference of the other two opposite angles: θ = |angle B − angle D| ÷ 2.

Sum of Interior Angles of a Polygon

The sum of the interior angles of any n-sided polygon is given by the formula: (n − 2) × 180°. For a quadrilateral (n = 4), the sum is always 360°.

Q38. Answer: (c) 1.85

Shortcut Trick

In a continued proportion a : b :: b : c, the formula is $c = b^2 \div a$.

Given values: a = 7.4 and b = 3.7.

x = (3.7 × 3.7) ÷ 7.4

x = 3.7 ÷ 2 = 1.85

Therefore The correct answer is 1.85.

Alternate Method

Given:
Proportion: 7.4 : 3.7 :: 3.7 : x
Formula Used:
Product of extremes = Product of means
For a : b :: c : d => a × d = b × c
Calculations:
=> 7.4 × x = 3.7 × 3.7
=> x = (3.7 × 3.7) ÷ 7.4
=> x = (3.7 × 3.7) ÷ (2 × 3.7)
=> x = 3.7 ÷ 2
=> x = 1.85
Therefore The correct answer is 1.85.
Additional Information
Third Proportional
When three numbers a, b, and c are in continued proportion (a:b = b:c), c is called the third proportional to a and b, where $c = b^2/a$.
Mean Proportional
The mean proportional between two numbers a and c is b, such that $b = \sqrt{(a \times c)}$.
Fourth Proportional
In a proportion a : b :: c : d, d is the fourth proportional and is calculated as d = (b × c) / a.

Q39. Answer: (a) Rs. 1,419

Shortcut Trick
Salary is always 100%.
Savings = 45% → Expenditure = 100% − 45% = 55%.
Expenditure = 55% of Rs. 2,580 = 0.55 × 2580.
Expenditure = Rs. 1,419.
Therefore The correct answer is Rs. 1,419.
Alternate Method
Given:
Total monthly Salary = Rs. 2,580
Savings percentage = 45%
Formula Used:
Expenditure = Salary − Savings
Calculations:
=> Savings amount = 45% of 2580
=> Savings = (45 ÷ 100) × 2580 = 0.45 × 2580 = Rs. 1,161
=> Expenditure = Total Salary − Savings
=> Expenditure = 2580 − 1161
=> Expenditure = Rs. 1,419
Therefore The correct answer is Rs. 1,419.
Additional Information
Percentage Change
New Value = Original Value × (100 ± Change%)/100. Use − for decrease (expenditure after savings).
Base Change Rule
When calculating parts of a whole, ensure the base (Total Salary) remains constant for both percentages.
Successive Percentage
If spending is from the 'remaining' amount, use the formula: Final = Initial × (1 − r1/100) × (1 − r2/100).

Q40. Answer: (c) 53

Shortcut Trick
Arrange the 11 observations in ascending order:
11, 12, 38, 38, 49, 53, 55, 60, 70, 93, 98

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Since the number of terms (n = 11) is odd, the median is the middle-most term:

Median = ((11 + 1) ÷ 2)^(th) term = 6^(th) term = 53

Therefore The correct answer is 53.

Alternate Method

Given:

Observations: 93, 38, 12, 55, 70, 98, 60, 49, 53, 11, 38

Total number of observations (n) = 11

Formula Used:

When the number of observations (n) is odd:

Median = ((n + 1) ÷ 2)^(th) observation

Calculations:

Arrange the given data in ascending order:

=> 11, 12, 38, 38, 49, 53, 55, 60, 70, 93, 98

Count the number of observations:

=> n = 11 (which is an odd number)

Apply the median formula for odd n:

=> Median = ((11 + 1) ÷ 2)^(th) term

=> Median = (12 ÷ 2)^(th) term

=> Median = 6^(th) term

Looking at the sorted list, the 6^(th) term is 53.

Let's explain why other options are incorrect:

=> Option (1) 60 is the 8^(th) term, which is incorrect.

=> Option (2) 55 is the 7^(th) term, which is incorrect.

=> Option (4) 49 is the 5^(th) term, which is incorrect.

Therefore The correct answer is 53.

Additional Information

Median for Even Number of Observations

If n is even, the median is the average of the (n ÷ 2)^(th) and ((n ÷ 2) + 1)^(th) observations: Median = [(n/2)^(th) term + (n/2 + 1)^(th) term] ÷ 2.

Mean, Median, and Mode Relationship

For a moderately skewed distribution, the empirical relationship is: Mode = 3 × Median − 2 × Mean.

Properties of Median

The median is not affected by extremely large or small values (outliers), making it a better measure of central tendency than the mean for skewed data.

Q41. Answer: (c) 58.47

Shortcut Trick

Average Speed = Total Distance ÷ Total Time

Total Distance = 204 + 424 + 366 = 994 km

Total Time = (204 ÷ 68) + (424 ÷ 53) + (366 ÷ 61) = 3 + 8 + 6 = 17 hours

Average Speed = 994 ÷ 17 ≈ 58.47 km/hr

Therefore The correct answer is 58.47 km/hr.

Alternate Method

Given:

D1 = 204 km, S1 = 68 km/hr

D2 = 424 km, S2 = 53 km/hr

D3 = 366 km, S3 = 61 km/hr

Formula Used:

Time = Distance ÷ Speed

Average Speed = (D1 + D2 + D3) ÷ (T1 + T2 + T3)

Calculations:

=> T1 = 204 ÷ 68 = 3 hours

=> T2 = 424 ÷ 53 = 8 hours

=> T3 = 366 ÷ 61 = 6 hours

=> Total Time = 3 + 8 + 6 = 17 hours

=> Total Distance = 204 + 424 + 366 = 994 km

=> Average Speed = 994 ÷ 17

=> Average Speed = 58.4705... ≈ 58.47 km/hr

Therefore The correct answer is 58.47 km/hr.

Additional Information

Average Speed for Equal Distances

If two equal distances are covered at speeds x and y, the average speed is (2xy) ÷ (x + y).

Relative Speed

Relative speed is the sum of speeds if moving in opposite directions (S1 + S2) and the difference if moving in the same direction (S1 − S2).

Conversion Factor

To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Q42. Answer: (c) 1

Given series: (Left) 2 6 % 2 6 4 € 7 * 9 $ 3 € 6 1 2 @ 8 % € 9 2 (Right)

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

Required condition: Number - Symbol - Symbol

(Left) 2 6 % 2 6 4 € 7 * 9 $ 3 € 6 1 2 @ 8 % € 9 2 (Right)

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

Hence, "Option 3" is the correct answer.

Q43. Answer: (b) 4 km towards the south

Given:

Mr. P starts from Point C and drives 5 km towards the west.

He then takes a left turn, drives 6 km, turns left and drives 8 km.

He then takes a right turn, drives 2 km, turns left and drives 4 km.

He then takes left turn and drives 12 km.

He takes a final left turn drives 7 km and stops at Point P.

Thus, Mr. P should drive 4 km in the south direction in order to reach Point C again.

Hence, "Option 2" is the correct answer.

Q44. Answer: (d) BDG

The logic followed here is.

Hence, the correct answer is "Option 4"..

Q45. Answer: (c) 942

The logic followed here is:

Hence, "Option 3" is the correct answer.

Q46. Answer: (b) 55.53%

Shortcut Trick

Successive discount multiplier = (1 − d1) × (1 − d2) × (1 − d3)

Net multiplier = (1 − 0.29) × (1 − 0.28) × (1 − 0.13) = 0.71 × 0.72 × 0.87

Net multiplier = 0.5112 × 0.87 = 0.444744

Single equivalent discount = (1 − 0.444744) × 100 = 55.5256%

Rounding up to two decimal places, we get 55.53%.

Therefore The correct answer is 55.53%.

Alternate Method

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Given → Discounts are 29%, 28%, and 13%.

Formulas: Successive discount for two = a + b − (a × b) ÷ 100

=> First two discounts: 29 + 28 − (29 × 28) ÷ 100 = 57 − 8.12 = 48.88%

=> Combine with third: 48.88 + 13 − (48.88 × 13) ÷ 100

=> 61.88 − 6.3544 = 55.5256%

=> Rounding to two decimal places = 55.53%

Therefore The correct answer is 55.53%.

Additional Information

Successive Discounts

When multiple discounts are applied one after another, the net discount is less than the sum of individual percentages because each subsequent discount is calculated on the reduced price.

Rounding Rules

When rounding to two decimal places, if the third decimal is 5 or greater, the second decimal digit is incremented by 1.

Q47. Answer: (c) The Court permitted the petitioner to approach online platforms and search engines to mask their identities

The Correct answer is The Court permitted the petitioner to approach online platforms and search engines to mask their identities.

Key Points

• The Delhi High Court ruling in November 2024 dealt with the 'Right to Be Forgotten', a concept gaining traction globally to allow individuals to have their personal data removed from public platforms under certain conditions.

• In this case, the Court recognized the petitioner's right to request that their identity be masked on online platforms and search engines, ensuring that their personal information is not readily accessible to the public.

• This decision emphasizes the protection of the right to privacy, which has been upheld as a fundamental right under Article 21 of the Indian Constitution.

• The judgement allowed individuals to exercise control over their digital footprint, particularly in sensitive cases like matrimonial disputes or acquittals in legal proceedings.

• The ruling aligns with the broader global discourse on balancing the right to privacy with the public's right to information.

• The Court's decision sets a precedent for addressing privacy concerns in the digital age, especially in light of India's evolving data protection framework.

Additional Information

• Right to Be Forgotten

• The 'Right to Be Forgotten' allows individuals to request the removal of their personal data from the internet under certain conditions, particularly when the data is no longer relevant or serves no legitimate purpose.

• This right has been recognized in countries like the European Union under the General Data Protection Regulation (GDPR).

• In India, this concept is still evolving, and its integration into laws like the Data Protection Bill is under discussion.

• Key points from the other options:

• Option 1: The Court did not reject the applicability of the 'Right to Be Forgotten' in cases of acquittal or quashed criminal proceedings; rather, it focused on balancing privacy with public interest.

• Option 2: While privacy is crucial, the Court did not specifically state that it cannot override public interest in matrimonial cases; instead, it permitted identity masking based on circumstances.

• Option 4: The Court did not mandate that the names of the couple in matrimonial disputes must remain public; instead, it allowed for masking to protect privacy.

Q48. Answer: (b) OIC

The logic followed here is.

Hence, the correct answer is "Option 2"..

Q49. Answer: (c) 10%

The Correct answer is 10%.

Key Points

• The 103rd Amendment Act, 2019 introduced a provision for reservation of 10% for the Economically Weaker Sections (EWS) of the general category in government jobs and educational institutions.

• This amendment added Clause (6) to Article 15 and Article 16 of the Indian Constitution to enable this provision.

• The reservation is aimed at providing social and economic justice to individuals who belong to the general category but face financial hardships.

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• The criteria for EWS reservation include individuals whose family income is below Rs. 8 lakh per annum, among other asset-related conditions.

• This is the first reservation provision in India based solely on economic criteria, rather than caste, tribe, or backward class categories.

• The cap of 10% was decided to ensure that the overall reservation in India does not exceed the 50% ceiling imposed by the Supreme Court in the Indra Sawhney judgment (1992).

• The amendment is widely regarded as a significant step toward addressing the needs of economically disadvantaged sections of society while balancing constitutional provisions.

Additional Information

• Article 15(6)

• Article 15(6) allows the state to make special provisions for the advancement of Economically Weaker Sections (EWS) in matters of education.

• This includes reservation in educational institutions, both aided and unaided, except for minority institutions.

• Article 16(6)

• Article 16(6) empowers the state to provide reservation to the Economically Weaker Sections in matters of employment.

• This ensures equal opportunity in public employment for individuals from economically weaker backgrounds.

• Indra Sawhney Judgment

• The Indra Sawhney case (1992) established the 50% ceiling for reservations in India to maintain the principle of equality.

• It also clarified the concept of social and educational backwardness as a basis for reservation.

Q50. Answer: (d) Pt. Madan Mohan Malviya

The Correct answer is Pt. Madan Mohan Malviya.

Key Points

• The Poona Pact was an agreement signed on September 24, 1932, between Mahatma Gandhi and Dr. B.R. Ambedkar.

• This agreement was related to the issue of separate electorates for the depressed classes (Scheduled Castes).

• It was signed at Yerwada Central Jail, Pune, where Gandhi was imprisoned.

• Since Gandhi was in jail, the pact was signed on his behalf by Pt. Madan Mohan Malviya, a prominent leader of the Indian National Congress.

• Dr. B.R. Ambedkar signed the pact on behalf of the depressed classes.

• The Poona Pact resulted in a compromise: instead of a separate electorate, the depressed classes were given reserved seats in the general electorate.

• It was a significant event in India's freedom struggle as it addressed the issue of political representation for marginalized communities.

• The pact also marked a step towards social justice and equality within the Indian society.

Additional Information

• Jawaharlal Nehru

• Jawaharlal Nehru was an eminent leader of the Indian National Congress and later became the first Prime Minister of India.

• He played a key role in the freedom movement but was not directly involved in the Poona Pact negotiations.

• Nehru is well-known for his contributions to the Non-Aligned Movement and his vision for a modern, secular India.

• Sardar Vallabhbhai Patel

• Sardar Vallabhbhai Patel is known as the Iron Man of India for his efforts in the integration of princely states into independent India.

• While he was a prominent leader in the freedom struggle, he was not a signatory or mediator in the Poona Pact.

• Patel is also remembered for his role in the Bardoli Satyagraha.

• Dr. Rajendra Prasad

• Dr. Rajendra Prasad was a leader of the Indian National Congress and later became the first President of India.

• He was active in the freedom movement and contributed to the Champaran Satyagraha.

• However, he was not directly involved in the Poona Pact.

Q51. Answer: (c) JD-OW

The logic followed here is:

Option 1) WQ-BI

Option 2) UO-ZG

Option 3) JD-OW

Option 4) BV-GN
Thus, out of all "JD-OW" is the odd one out.
Hence, "Option 3" is the correct answer.

Q52. Answer: (b) 6

According to the given information,
Thus, 'W' is coded as '6'.
Hence, "Option 2" is the correct answer.

Q53. Answer: (b) 75/7

Given:
Simplify: 25 ÷ { 7 × ((3)/(5) of (5)/(9)) }
Formula used:
"of" means multiplication.
Calculation:
Simplify the inner brackets: ((3)/(5) of (5)/(9))
=> ((3)/(5) × (5)/(9))
=> (3 × 5) / (5 × 9)
=> 15 / 45
=> 1 / 3
Now, substitute back: 25 ÷ { 7 × (1/3) }
=> 25 ÷ (7 × 1/3)
=> 25 ÷ (7/3)
=> 25 × (3/7)
=> (25 × 3) / 7
=> 75 / 7
Therefore The correct answer is option (2).

Q54. Answer: (a) 25 6/7

Shortcut Trick
Total Work (LCM of 24, 28) = 168 units.
Efficiency: A = 7, B = 6.
2-day work cycle (B then A) = 6 + 7 = 13 units.
In 12 cycles (24 days), work done = 12 × 13 = 156 units. Remaining = 12 units.
Day 25 (B's turn): B does 6 units. Remaining = 6 units. Day 26: A takes 6/7 days.
Therefore The correct answer is 25 6/7 days.
Alternate Method
Given: Time taken by A = 24 days, B = 28 days. Working alternately starting with B.
Formula Used: Efficiency = Total Work ÷ Time; Total Work = LCM of individual times.

Person	Days	Total Work	Efficiency
A	24	168	7
B	28	6	

=> Total efficiency in a 2-day cycle (B + A) = 6 + 7 = 13 units.
=> Number of complete cycles = 168 ÷ 13 = 12 cycles with a remainder.
=> Work completed in 12 cycles (24 days) = 12 × 13 = 156 units.
=> Remaining work = 168 − 156 = 12 units.
=> On 25^(th) day, B works and completes 6 units. Remaining = 12 − 6 = 6 units.
=> On 26^(th) day, A works. Time taken by A = Remaining work ÷ Efficiency = 6 ÷ 7 days.
=> Total time = 24 + 1 + 6/7 = 25 6/7 days.
Therefore The correct answer is 25 6/7 days.
Additional Information

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Alternate Day Work

In alternate day problems, identify the unit cycle (usually 2 days) and calculate work per cycle. The starting person significantly affects the remainder calculation.

Time and Work Relation

Work is always considered as 1 unit or the LCM of given days to simplify calculations. Efficiency is inversely proportional to time taken.

Q55. Answer: (c) maritime trade

The Correct answer is maritime trade.

Key Points

• Lothal was one of the most important cities of the Indus Valley Civilization and is located in present-day Gujarat, India.

• The city was a prominent center for maritime trade due to its strategically constructed dockyard, which is considered one of the oldest in the world.

• The dockyard at Lothal was connected to the Sarashwati River (now dried up) and had access to the sea, facilitating trade routes with Mesopotamia, Egypt, and other regions.

• Lothal's people are credited for their advanced knowledge of engineering and hydrology, which allowed them to construct a dockyard with a proper drainage system.

• Excavations have revealed evidence of bead-making factories, which produced goods like ornaments, semi-precious stones, and seals, highlighting their role in trade.

• Artifacts such as weights, seals, and tools found at Lothal indicate the city's involvement in a system of standardized trade practices during that era.

• Lothal is also significant for its urban planning, featuring a well-organized grid layout, advanced drainage systems, and warehouses for storing goods for trade.

• The city played a key role in connecting the Indus Valley Civilization with other ancient civilizations, contributing to the exchange of goods, culture, and ideas.

Additional Information

• Military base

• There is no evidence to suggest that Lothal served as a military base.

• The Indus Valley Civilization is known for its peaceful existence and lack of military artifacts, unlike other ancient civilizations.

• Copper mining

• Copper was an important resource during the Indus Valley Civilization; however, copper mining activities were concentrated in regions like Khetri in Rajasthan.

• Lothal was primarily known for its dockyard and trade, not for mining activities.

• Spiritual rituals

• While the Indus Valley Civilization had advanced religious practices, Lothal does not stand out as a significant center for spiritual rituals.

• The city is more renowned for its trade and urban planning than its religious contributions.

Q56. Answer: (d) 944

Shortcut Trick

Let the HCF be x. Then the numbers are 8x, 2x, and 1x.

The LCM of ratios (8, 2, 1) is 8.

Therefore, LCM of numbers = 8 × x = 7552.

Solving for x: x = 7552 ÷ 8 = 944.

Therefore The correct answer is 944.

Alternate Method

Given: Ratio of numbers = 8 : 2 : 1 and LCM = 7552.

Formula Used: LCM of numbers = (LCM of ratio parts) × HCF.

=> Let the numbers be 8k, 2k, and k, where k is the HCF.

=> LCM(8k, 2k, k) = k × LCM(8, 2, 1)

=> LCM(8, 2, 1) = 8

=> 8k = 7552

=> k = 7552 ÷ 8

=> k = 944

Therefore The correct answer is 944.

Additional Information

LCM and HCF Relation

For two numbers a and b, the product of the numbers is equal to the product of their LCM and HCF: a × b = LCM × HCF.

HCF of Fractions

HCF of fractions = (HCF of Numerators) ÷ (LCM of Denominators).

LCM of Fractions

LCM of fractions = (LCM of Numerators) ÷ (HCF of Denominators).

Q57. Answer: (c) 9216π

Shortcut Trick

Volume of hemisphere = $(2/3)\pi r^3$

Substitute radius (r) = 24 cm directly into the formula.

Volume = $(2/3) \times \pi \times 24 \times 24 \times 24 = 2 \times \pi \times 8 \times 24 \times 24$

Volume = $16 \times 576 \times \pi = 9216\pi$

Therefore The correct answer is 9216π cm³.

Alternate Method

Given:

Radius (r) of the hemispherical cap = 24 cm

Formula Used:

Volume of a hemisphere = $(2/3)\pi r^3$

Calculations:

=> Volume = $(2/3) \times \pi \times (24)^3$

=> Volume = $(2/3) \times \pi \times 13824$

=> Volume = $2 \times \pi \times 4608$

=> Volume = 9216π

Therefore The correct answer is 9216π cm³.

Additional Information

Total Surface Area of Hemisphere

The total surface area includes the curved surface and the flat base area: TSA = $3\pi r^2$.

Curved Surface Area of Hemisphere

The area of the outer curved part only: CSA = $2\pi r^2$.

Volume of a Sphere

A hemisphere is exactly half of a full sphere: Volume of Sphere = $(4/3)\pi r^3$.

Q58. Answer: (c) Southwest to northwest

The Correct answer is Southwest to Northwest.

Key Points

• The Himalayan ranges in Arunachal Pradesh are oriented in the Southwest to Northwest direction.

• This region is characterized by the Eastern Himalayas, which include some of the most rugged and remote terrains in India.

• The orientation of the ranges is influenced by the and the collision of the Indian Plate with the Eurasian Plate.

• In Arunachal Pradesh, the Himalayas consist of ranges such as the Siang, Mishmi, and Patkai Hills, which follow this southwest-to-northwest alignment.

• The natural orientation plays a crucial role in defining the climatic conditions, river systems, and vegetation of the region.

• It is also important for the local biodiversity, as the Eastern Himalayas are known for their rich flora and fauna.

• The region is part of the Indo-Burma biodiversity hotspot, which is globally recognized for its ecological significance.

• Key rivers such as the Brahmaputra and its tributaries originate or pass through these ranges, further highlighting their geographical importance.

Additional Information

• North to South Orientation

• In the context of Indian geography, the North to South orientation is not characteristic of the Himalayan ranges but can be seen in smaller regional features or mountain ranges.

• Examples include certain ranges of the Western Ghats or mountain systems with localized alignments.

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• Northwest to Southeast Orientation

• This orientation is typical for the general alignment of the Himalayas in their western parts.

• Ranges such as the Pir Panjal and parts of the Shivalik Hills follow this alignment.

• However, this does not apply to the Himalayan ranges in Arunachal Pradesh.

• East to West Orientation

• The East to West orientation is generally seen in the Trans-Himalayan ranges and certain geographical features outside the Indian subcontinent.

• In India, this alignment is rare for the Himalayas and is more characteristic of other mountain systems.

Q59. Answer: (c) 2,50,900

Shortcut Trick

Use the direct relation: Sum of Squares = n × (Variance + Mean²).

Given n = 100, Mean = 50, and Standard Deviation = 3.

Variance = $3^2 = 9$.

Sum of Squares = $100 \times (9 + 50^2) = 100 \times (9 + 2500) = 2,50,900$.

Therefore The correct answer is 2,50,900.

Alternate Method

Given:

Number of terms (n) = 100

Mean (μ) = 50

Standard Deviation (σ) = 3

Formula Used:

Variance $(\sigma^2) = (\sum x^2 / n) - (\mu)^2$

Calculations:

$\Rightarrow 3^2 = (\sum x^2 / 100) - 50^2$

$\Rightarrow 9 = (\sum x^2 / 100) - 2500$

$\Rightarrow 9 + 2500 = \sum x^2 / 100$

$\Rightarrow 2509 = \sum x^2 / 100$

$\Rightarrow \sum x^2 = 2509 \times 100$

$\Rightarrow \sum x^2 = 2,50,900$

Therefore The correct answer is 2,50,900.

Additional Information

Variance and Standard Deviation

Q60. Answer: (d) The substrate concentration at which the reaction rate is half of Vmax

The Correct answer is The substrate concentration at which the reaction rate is half of Vmax.

Key Points

• The Michaelis-Menten constant (Km) is a crucial parameter in enzyme kinetics, often used to describe the efficiency of an enzyme in catalyzing reactions.

• Km is defined as the substrate concentration at which the enzyme-catalyzed reaction rate is half of Vmax (maximum reaction rate).

• This constant reflects the enzyme's affinity for its substrate. A low Km value indicates a high affinity, meaning the enzyme works efficiently even at low substrate concentrations.

• Conversely, a high Km value suggests a lower affinity, requiring higher substrate concentrations for effective catalysis.

• The Michaelis-Menten equation, $v = (V_{max}[S]) / (K_m + [S])$, relates the reaction rate (v) to substrate concentration ([S]), Vmax, and Km.

• The concept is widely applied in biochemistry and molecular biology to study enzyme behavior and design inhibitors for therapeutic purposes.

• This parameter is particularly relevant for understanding enzyme function in different physiological and pathological contexts.

Additional Information

• The enzyme concentration required for half-maximal catalysis

• The term refers to the amount of enzyme needed for half-maximal reaction but is not related to the definition of Km. Km depends on substrate concentration, not enzyme concentration.

• The maximum reaction rate (Vmax)

• Vmax is the highest reaction rate achieved when the enzyme is saturated with substrate. While Km is tied to Vmax, it does not describe the reaction rate itself.

• The inhibitor concentration that reduces enzyme activity by 50%

• This concept is related to IC50 (Inhibitory Concentration 50), which is different from Km. IC50 is used to measure inhibitor potency rather than substrate affinity.

Q61. Answer: (b) RZ −16

The logic followed here is:

MP 14 is related to LS −1

And,

NK 5 is related to MN −10

Similarly,

SW −1 is related to

Hence, "Option 2" is the correct answer.

Q62. Answer: (a) 17 - 18 - 22 - 44

The logic followed here is:

Given:

5 - 6 - 10 - 20

5 + 1 = 6

6 + 4 = 10

10 × 2 = 20

And,

12 - 13 - 17 - 34

12 + 1 = 13

13 + 4 = 17

17 × 2 = 34

So, checking for each option one by one:

Option 1) 17 - 18 - 22 - 44

17 + 1 = 18

18 + 4 = 22

22 × 2 = 44

Option 2) 15 - 16 - 20 - 30

15 + 1 = 16

16 + 4 = 20

20 × 2 = 40 ≠ 30

Option 3) 23 - 24 - 28 - 54

23 + 1 = 24

24 + 4 = 28

28 × 2 = 56 ≠ 54

Option 4) 7 - 8 - 12 - 26

7 + 1 = 8

8 + 4 = 12

12 × 2 = 24 ≠ 26

Hence, "Option 1" is the correct answer.

Q63. Answer: (a) 63

Shortcut Trick

Net filling rate = (A × B) ÷ (B − A) where A is filling time and B is emptying time.

Time taken = (14 × 18) ÷ (18 − 14)

Time taken = (14 × 18) ÷ 4 = 252 ÷ 4

Time taken = 63 hours.

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Therefore The correct answer is 63 hours.

Alternate Method

Given: Filling tap time = 14 hours, Emptying tap time = 18 hours.

Tap Type	Hours	Total Work (LCM)	Efficiency
Filling Tap (A)	14	126 units	+9
Emptying Tap (B)	18	−7	

=> Net efficiency of both taps = 9 − 7 = 2 units/hour

=> Total work to fill the tank = 126 units

=> Time taken = Total Work ÷ Net Efficiency

=> Time taken = 126 ÷ 2

=> Time taken = 63 hours

Therefore The correct answer is 63 hours.

Additional Information

Pipes and Cisterns Concept

Filling taps have positive efficiency, while emptying taps (leakage) have negative efficiency.

Net Work Formula

If pipe A fills in 'x' hours and pipe B empties in 'y' hours (where y > x), time to fill is xy/(y − x).

LCM Method

Total capacity is assumed as the LCM of individual times to simplify unit-based calculations.

Q64. Answer: (a) 1005

Shortcut Trick

Ratio of Girls : Boys = 1 : 5.

Given 1 unit = 201 (Number of girls).

Number of boys = 5 units = 5 × 201 = 1005.

Therefore The correct answer is 1005.

Alternate Method

Given:

Ratio of Girls to Boys = 1 : 5

Number of Girls = 201

Formula Used:

Value of one part = (Given Quantity) ÷ (Corresponding Ratio Part)

Required Quantity = (Value of one part) × (Required Ratio Part)

Calculations:

=> Ratio of Girls (G) : Boys (B) = 1 : 5

=> Let Girls = 1x and Boys = 5x

=> x = 201

=> Number of Boys = 5x

=> Number of Boys = 5 × 201

=> Number of Boys = 1005

Therefore The correct answer is 1005.

Additional Information

Ratio & Proportion

A ratio compares two quantities. If a : b = x : y, then a/b = x/y.

Total Participants

To find the total number of students, add the units (1 + 5 = 6 units) and multiply by the value of one unit (6 × 201 = 1206).

Unitary Method

This method involves finding the value of a single unit first and then multiplying to find the required value.

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Q65. Answer: (b) Article 15

The Correct answer is Article 15.

Key Points

• Article 15 of the Constitution of India prohibits the state from discriminating against any citizen on grounds of religion, race, caste, sex, or place of birth.

• The second clause of Article 15(2) specifically prohibits discrimination in accessing shops, public restaurants, hotels, and places of public entertainment, as well as the use of wells, tanks, bathing ghats, roads, and places of public resort maintained wholly or partly by State funds.

• This article aims to ensure equality and abolish all forms of social discrimination that restrict access to public amenities.

• It is part of the Fundamental Rights under the Constitution, emphasizing equality and safeguarding the rights of marginalized groups.

• The provision ensures the promotion of an inclusive society, fostering harmony and equal opportunity for all citizens of India.

• It reflects the core values of justice, equality, and fraternity enshrined in the Preamble of the Constitution.

• This article plays a crucial role in reducing the practices of untouchability and other forms of discrimination in Indian society.

Additional Information

• Article 18

• Article 18 deals with the abolition of titles, except for academic and military distinctions.

• It prohibits the state from conferring titles and prevents Indian citizens from accepting titles from a foreign state.

• This article ensures the principle of equality and eliminates any form of aristocracy.

• Article 17

• Article 17 abolishes untouchability and forbids its practice in any form.

• It is a significant provision aimed at eradicating caste-based discrimination in Indian society.

• Any act of untouchability is an offense punishable under law.

• Article 16

• Article 16 guarantees equality of opportunity in matters of public employment.

• It prohibits discrimination in public employment on the grounds of religion, race, caste, sex, descent, place of birth, or residence.

• The article, however, allows for reservation policies for socially and educationally backward classes, Scheduled Castes, and Scheduled Tribes.

Q66. Answer: (a) East

Given:

Town G is to the south of Town H.

Town I is to the east of Town H.

Town J is to the west of Town I.

Town K is to the north of Town J.

Town G is to the south-east of Town K.

Thus, Town H is to the east of Town J.

Hence, "Option 1" is the correct answer.

Q67. Answer: (d) 33

The logic followed here is:

Hence, "Option 4" is the correct answer.

Q68. Answer: (a) Vindhyan Plateau

The Correct answer is Vindhyan Plateau

Key Points

• The Vindhyan Plateau is not a part of the physiographic subdivisions of the Northern Plains of India.

• The Northern Plains are primarily divided into regions based on the deposition of alluvial soil brought by rivers such as the Ganga, Brahmaputra, and Indus.

• The Vindhyan Plateau is part of the Peninsular Plateau, which is a distinct physiographic region of India.

• It is characterized by rugged terrain, hard rocks, and plateaus, unlike the fertile alluvial plains of the Northern Plains.

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• The Vindhyan Plateau lies in central India and is bounded by the Vindhya mountain range.

• This region is composed predominantly of sedimentary rocks, and it does not feature the characteristics associated with the Northern Plains.

• The physiographic divisions of the Northern Plains include Bhangar, Khadar, Tarai Tract, and floodplains, all of which are alluvial regions formed by river systems.

Additional Information

• Bhangar

• Bhangar refers to the older alluvium deposits found in the Northern Plains of India.

• It is characterized by a slightly elevated terrain compared to the Khadar regions.

• Bhangar soils are less fertile as they contain calcareous deposits called 'Kankar'.

• Tarai Tract

• The Tarai Tract is a marshy region located at the foothills of the Himalayas.

• This region is formed due to the percolation of rivers as they enter the plains, leading to waterlogged soil.

• The Tarai is known for its rich biodiversity and is home to several national parks, such as Jim Corbett National Park.

• Khadar

• Khadar refers to the newer alluvium deposits found in the floodplains of rivers in the Northern Plains.

• It is highly fertile due to the continuous deposition of fresh alluvium during floods.

• Khadar regions are preferred for agricultural activities.

Q69. Answer: (c) LRN

The logic followed here is:

Option 1) QWR

Option 2) NTO

Option 3) LRN

Option 4) SYT

Thus, out of all "LRN" is the odd one out.

Hence, "Option 3" is the correct answer.

Q70. Answer: (b) Serious

The Correct answer is Serious.

Key Points

• The Global Hunger Index (GHI) is a tool designed to comprehensively measure and track hunger at global, regional, and national levels.

• India was categorized as "Serious" in the Global Hunger Index (GHI) 2024, indicating significant challenges related to hunger and malnutrition.

• The GHI score is calculated based on four key indicators: undernourishment, child stunting, child wasting, and child mortality.

• This categorization highlights that a significant portion of India's population still faces issues related to food insecurity and malnutrition.

• The Global Hunger Index is published annually by Concern Worldwide and Welthungerhilfe.

• India's position in the "Serious" category underlines the need for focused interventions, like improving nutrition programs, food distribution systems, and agricultural reforms.

• Despite economic growth, the persistence of hunger is attributed to factors such as poverty, inadequate healthcare, and lack of education.

• India's performance in the GHI affects its global image and emphasizes the importance of achieving Sustainable Development Goal (SDG) 2: Zero Hunger.

Additional Information

• Alarming

• The "Alarming" category in the Global Hunger Index represents extremely severe levels of hunger and malnutrition in a country.

• Countries in this category face critical challenges with widespread undernourishment and high rates of child mortality.

• Examples of countries that have been categorized as "Alarming" in the past include some nations in sub-Saharan Africa.

• Moderate

• The "Moderate" category indicates a relatively lower level of hunger and malnutrition compared to "Serious" and "Alarming" categories.

• Countries in this category have made progress in addressing issues such as food security and child nutrition.

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• Examples of countries in this category are often middle-income nations with ongoing efforts to reduce hunger.

• Low

• The "Low" category reflects minimal levels of hunger and malnutrition, indicating a well-functioning food system and effective nutrition policies.

• Most developed countries fall under this category, such as those in Western Europe and North America.

• These nations typically enjoy high levels of economic development and social infrastructure.

Q71. Answer: (b) Tamil Nadu

The Correct answer is Tamil Nadu.

Key Points

• Tamil Nadu is unique among Indian states as it receives rainfall from both the Southwest Monsoon and the Northeast Monsoon.

• The state receives the majority of its rainfall during the Northeast Monsoon (October to December), which is also known as the Retreating Monsoon.

• During the Southwest Monsoon (June to September), Tamil Nadu receives rainfall primarily in the western parts of the state due to the Western Ghats acting as an orographic barrier.

• The Northeast Monsoon is vital for Tamil Nadu as it contributes to about 48% of the total annual rainfall in the state.

• The geographical location of Tamil Nadu, being adjacent to the Bay of Bengal, plays a crucial role in attracting cyclonic systems and heavy rainfall during the Northeast Monsoon.

• Major cities like Chennai and the Cauvery Delta region rely heavily on the Northeast Monsoon for their water requirements.

• This dual monsoon pattern is critical for agriculture, water resources, and livelihood in Tamil Nadu.

Additional Information

• Bihar

• Bihar receives most of its rainfall during the Southwest Monsoon (June to September).

• The state does not benefit significantly from the Northeast Monsoon, as its geographical location lies far from the influence of retreating monsoon winds.

• Kosi River, often termed the “Sorrow of Bihar,” causes severe flooding during the monsoon season.

• Maharashtra

• Maharashtra receives rainfall predominantly during the Southwest Monsoon (June to September).

• The state is home to the Western Ghats, which experience heavy orographic rainfall during this period.

• Regions such as Konkan and Western Maharashtra are particularly known for their heavy monsoon rains.

• Gujarat

• Gujarat receives most of its rainfall from the Southwest Monsoon, particularly during the months of June to September.

• The state is located in a semi-arid region, and the rainfall is unevenly distributed, with Saurashtra receiving less precipitation compared to other parts.

• The Narmada River and projects like the Sardar Sarovar Dam play a significant role in water management for the state.

Q72. Answer: (a) Starts the slide show from the beginning

The Correct answer is Starts the slide show from the beginning.

Key Points

• Pressing F5 in MS PowerPoint 2019 starts the Slide Show from the very first slide.

• The Slide Show feature is used to present a sequence of slides to an audience in a full-screen mode.

• This shortcut is widely used during presentations to instantly begin the slideshow without navigating through menus.

• The feature is especially helpful for teachers, corporate professionals, and students to deliver organized and visually appealing content.

• When the F5 key is pressed, PowerPoint transitions into presentation mode, displaying slides as designed.

• The function ensures that the presentation starts from slide one, making it ideal for formal and structured demonstrations.

• This shortcut is part of the keyboard shortcuts available in Microsoft Office applications to enhance user productivity.

Additional Information

• Opens the 'Print' dialog box

• This action is performed by pressing Ctrl + P in MS PowerPoint.

• The Print dialog box allows users to configure printing options such as number of copies, printer selection, and layout settings.

• Inserts a new slide

• To insert a new slide, the shortcut key is Ctrl + M.

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• This function is used to add slides during the editing phase of a presentation.
• Saves the presentation
• Pressing Ctrl + S saves the presentation in PowerPoint.
• Saving ensures that no data is lost and allows users to keep their work updated.

Q73. Answer: (b) Mandrata

The Correct answer is Mandrata.

Key Points

• Mandrata is not one of the primary tones used in Vedic chanting.
• The three primary tones in Vedic chanting are Udatta (high tone), Anudaatta (low tone), and Svarita (middle tone).
• These tones are used to maintain the intonation and rhythm of the chants, which is crucial for preserving the accuracy and sanctity of the Vedic texts.
• Vedic chanting is a highly sophisticated oral tradition that requires precise pronunciation and tonal modulation.
• The intonation system ensures the transmission of Vedic knowledge in its original form without distortion.
• The term Mandrata does not refer to any recognized tonal pattern or intonation system in Vedic literature. Instead, it may have been introduced erroneously or as a distractor in the options.

Additional Information

• Udatta
• Udatta is the high tone used in Vedic chanting.
• It plays a critical role in maintaining the melodic structure of the chants.
• This tone is characterized by its sharp and elevated pitch, which provides emphasis to specific syllables.
• Anudaatta
• Anudaatta refers to the low tone in Vedic chanting.
• This tone is used to create a contrast with Udatta and helps establish a balanced tonal pattern.
• Anudaatta is generally and is not emphasized in the chanting process.
• Svarita
• Svarita is the middle tone in Vedic chanting.
• It is produced by a slight elevation following the low tone of Anudaatta.
• This tone serves as a transition between the high and low tones, ensuring the fluidity of the chant.

Q74. Answer: (c) Annamalai Range, Cardamom Hills, Palani Hills

The Correct answer is Annamalai Range, Cardamom Hills, Palani Hills.

Key Points

• Anaimudi is the highest peak in South India, with an elevation of 2,695 meters (8,842 feet) above sea level.
• It is located in the Western Ghats mountain range in the state of Kerala, India.
• The peak lies at the tri-junction of three major hill ranges: Annamalai Range, Cardamom Hills, and Palani Hills.
• The name "Anaimudi" translates to "Elephant's Forehead" in Tamil and Malayalam, reflecting the shape of the peak.
• The region surrounding Anaimudi is home to the Eravikulam National Park, which is known for its rich biodiversity, including the Nilgiri Tahr, an endangered species of mountain goat.
• Anaimudi is a significant destination for trekking enthusiasts and offers breathtaking views of the lush greenery and tea plantations of the Western Ghats.
• The peak is also an important part of the UNESCO World Heritage-listed Western Ghats, recognized for its ecological and cultural significance.

Additional Information

• Nilgiri Hills, Western Ghats, Eastern Ghats
• The Nilgiri Hills are part of the Western Ghats, located in Tamil Nadu, Kerala, and Karnataka. However, Anaimudi is not situated at the tri-junction of these ranges.
• The Eastern Ghats are a discontinuous range of mountains along the eastern coast of India, distinct from the Western Ghats.
• Rajmahal Hills, Garo Hills, Khasi Hills
• The Rajmahal Hills are located in Jharkhand, and the Garo Hills and Khasi Hills are in Meghalaya in northeastern India.
• These hills are not related to the location of Anaimudi or the Western Ghats.
• Mahadeo Hills, Maikala Range, Rajpipla Hills
• The Mahadeo Hills are located in Madhya Pradesh, while the Maikala Range is in Chhattisgarh, and the Rajpipla Hills are in

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Gujarat.

• These ranges are not part of the Western Ghats or associated with Anaimudi.

Q75. Answer: (c) Two

Given number: 6193425

According to the question,

Number given	6	1	9	3	4	2	5
Odd digit → (-1) Even digit → (+2)	(+2)	(-1)	(-1)	(-1)	(+2)	(+2)	(-1)
Resultant number	8	0	8	2	6	4	4

So, the number of digits that appeared more than once in the new number thus formed are → 8 and 4 = Two

Hence, "Option 3" is the correct answer.

Q76. Answer: (c) Article 38

The Correct answer is Article 38.

Key Points

• Article 38 of the Indian Constitution is a part of the Directive Principles of State Policy (DPSP).

• This article directs the State to secure a social order for the promotion of the welfare of the people by striving to minimize inequalities in income, status, facilities, and opportunities.

• The provision under this article is aimed at creating a just and equitable society.

• It emphasizes the need for reducing inequalities among individuals and groups in all spheres of life, including economic, social, and political aspects.

• Article 38(1) directs the State to promote the welfare of the people by securing and protecting a social order in which justice (social, economic, and political) is accessible to all.

• Article 38(2) further instructs the State to strive to reduce inequalities not only among individuals but also among groups of people residing in different areas or engaged in different vocations.

• The DPSPs, including Article 38, are non-justiciable, meaning they cannot be enforced by the courts, but they act as guiding principles for governance and policymaking.

• The objective of Article 38 aligns with the vision of creating a welfare state, a fundamental goal of the Indian Constitution.

Additional Information

• Article 40

• Article 40 focuses on the organization of village panchayats.

• It directs the State to take steps to organize village panchayats and endow them with such powers and authority as may be necessary to enable them to function as units of self-government.

• This article is significant for promoting grassroots democracy and decentralized governance in India.

• Article 37

• Article 37 highlights that the Directive Principles of State Policy (DPSP) are fundamental in the governance of the country and it shall be the duty of the State to apply these principles in making laws.

• However, the DPSPs, including Article 37, are non-enforceable by any court, unlike fundamental rights.

• Article 39

• Article 39 directs the State to ensure that certain principles are followed for the betterment of society, such as equal pay for equal work, distribution of resources to subserve the common good, protection of children, and prevention of exploitation.

• This article is crucial for achieving socio-economic justice in India.

Q77. Answer: (c) 22

Given number: 571649

According to the question,

Number given	5	7	1	6	4	9
Odd digit → (-1) Even digit → (+2)	(-1)	(-1)	(-1)	(+2)	(+2)	(-1)

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Resultant number	4	6	0	8	6	8

So, the sum of the last three digits from the left in the new number thus formed is → 8 + 6 + 8 = 22

Hence, "Option 3" is the correct answer.

Q78. Answer: (c) Bronze tools

The correct answer is Bronze tools.

Key Points

• The Harappan civilization, also known as the Indus Valley Civilization, dates back to approximately 2600 BCE to 1900 BCE.

• Bronze tools were predominantly used by the Harappans because they were in the Chalcolithic Age, which is marked by the use of copper and bronze as primary materials.

• The Harappans had advanced knowledge of metallurgy, and they created bronze by combining copper and tin.

• Bronze tools were used for a variety of purposes, including agriculture, construction, and daily activities.

• The Harappans were skilled in producing tools such as chisels, axes, and knives, which were essential for their urban lifestyle and trade practices.

• Artifacts from excavations at sites like Harappa and Mohenjo-Daro reveal the widespread use of bronze tools and items.

• The use of bronze tools reflects the Harappans' technological advancement and their ability to sustain a complex civilization with sophisticated urban planning and trade networks.

Additional Information

• Steel tools

• Steel tools were not used by the Harappans as steel production requires advanced technology, which was developed much later during the Iron Age and the Industrial Revolution.

• Steel became widely used only after the discovery of the Bessemer process in the 19th century.

• Iron tools

• Iron tools were not part of the Harappan civilization because the use of iron became prevalent during the Iron Age, which followed the decline of the Harappan civilization.

• The Iron Age in India began around 1200 BCE, much later than the Harappan period.

• Wooden tools

• While wooden tools might have been used for basic purposes, they were not as durable or efficient as bronze tools.

• Wooden tools lack the strength and versatility required for activities such as urban construction and agriculture, which were essential to the Harappans.

Q79. Answer: (a) Rose significantly

The Correct answer is Rose significantly.

Key Points

• Post the 1991 economic reforms in India, the country witnessed a significant rise in its per capita income. These reforms included liberalization, privatization, and globalization, which boosted economic growth.

• The reforms dismantled the License Raj system, removed trade barriers, and attracted foreign direct investment (FDI), leading to higher industrial and service sector output.

• The growth in sectors like information technology, pharmaceuticals, and services played a crucial role in increasing income levels.

• The reforms also led to the creation of new employment opportunities, enhancing the overall purchasing power and improving the standard of living.

• India's GDP growth rate surged during this period, often achieving an average growth rate of 6-8% annually, which directly impacted the per capita income.

• The rise in per capita income reflects the improved distribution of economic benefits among the population, even though disparities remained in certain regions.

• Key government measures, such as tax reforms and financial sector liberalization, further contributed to economic stability and growth.

Additional Information

• Declined sharply

• This option is incorrect because the 1991 reforms brought significant economic growth, not a decline. However, there was a short-term impact due to initial adjustments but no long-term sharp decline in per capita income.

• Remained stagnant

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• The per capita income did not remain stagnant. The liberalization policies ensured that the economy grew at a steady pace, leading to consistent increases in income levels.

• Became negative

• This option is incorrect as there was no significant economic downturn post-1991 that would turn per capita income negative. Instead, the economy grew at an accelerated rate.

Q80. Answer: (b) 6

Given number: 3678154

According to the question,

Number given	3	6	7	8	1	5	4
Odd digit → (+1) Even digit → (-2)	(+1)	(-2)	(+1)	(-2)	(+1)	(+1)	(-2)
Resultant number	4	4	8	6	2	6	2

So, difference between the highest and lowest digits in the number thus formed is → 8 - 2 = 6

Hence, "Option 2" is the correct answer.

Q81. Answer: (d) 56

Given:

$(8^2 \times 7^3) \div (\sqrt{64} \times \sqrt{2401})$

Formula used:

$\sqrt{a} \times \sqrt{b} = \sqrt{(a \times b)}$

a^m ÷ aⁿ = a^(m−n)

Calculation:

=> $8^2 = 64$

=> $7^3 = 343$

=> $\sqrt{64} = 8$

=> $\sqrt{2401} = 49$

=> $(64 \times 343) \div (8 \times 49)$

=> $(64 \div 8) \times (343 \div 49)$

=> $8 \times 7 = 56$

Therefore The simplified value is 56

Q82. Answer: (a) Thursday

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

1) No one has an exam before D.

2) Only three people have their exams between D and T.

Weekdays	Person
Monday	D
Tuesday	
Wednesday	
Thursday	
Friday	T
Saturday	
Sunday	

3) C has the exam on Wednesday.

4) Only one person has the exam between T and S.

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Weekdays	Person
Monday	D
Tuesday	
Wednesday	C
Thursday	
Friday	T
Saturday	
Sunday	S

5) E has the exam on one of the days after F but on one of the days before U.

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

Thus, E have the exam on Thursday.

Hence, "Option 1" is the correct answer.

Q83. Answer: (c) (9 + √45)/18 and (9 - √45)/18

Shortcut Trick

For a quadratic equation $ax^2 + bx + c = 0$, the roots are calculated as $x = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$.

Identify coefficients: $a = 9$, $b = -9$, $c = 1$.

Calculate Discriminant $(D) = b^2 - 4ac = (-9)^2 - 4(9)(1) = 81 - 36 = 45$.

Roots $= (9 \pm \sqrt{45}) / (2 \times 9) = (9 \pm \sqrt{45}) / 18$.

Therefore The correct answer is $(9 + \sqrt{45})/18$ and $(9 - \sqrt{45})/18$.

Alternate Method

Given:

Quadratic equation: $9x^2 - 9x + 1 = 0$

Formula Used:

The roots of $ax^2 + bx + c = 0$ are given by $x = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$

Calculations:

$\Rightarrow a = 9, b = -9, c = 1$

$\Rightarrow D = b^2 - 4ac$

$\Rightarrow D = (-9)^2 - 4 \times 9 \times 1$

$\Rightarrow D = 81 - 36 = 45$

$\Rightarrow x = [-(-9) \pm \sqrt{45}] / (2 \times 9)$

$\Rightarrow x = (9 \pm \sqrt{45}) / 18$

$\Rightarrow x1 = (9 + \sqrt{45}) / 18$

$\Rightarrow x2 = (9 - \sqrt{45}) / 18$

Therefore The correct answer is $(9 + \sqrt{45})/18$ and $(9 - \sqrt{45})/18$.

Additional Information

Nature of Roots

The Discriminant $(D = b^2 - 4ac)$ determines the root type: $D > 0$ means real and distinct roots, $D = 0$ means real and equal roots, and $D < 0$ means imaginary roots.

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Sum and Product of Roots

For equation $ax^2 + bx + c = 0$, Sum of roots $(\alpha + \beta) = -b/a$ and Product of roots $(\alpha\beta) = c/a$.

Quadratic Formula

Also known as Shridharacharya formula, it is the most reliable method to solve any quadratic equation where factorisation is difficult.

Q84. Answer: (a) Chennai

The Correct answer is Chennai.

Key Points

• The India-Russia bilateral naval exercise INDRA is conducted to strengthen maritime cooperation and enhance interoperability between the navies of both nations.

• The 14th edition of the bilateral naval exercise INDRA-2025 between India and Russia was conducted in Chennai.

• INDRA-2025 included various activities such as anti-submarine warfare, surface and air combat exercises, and search-and-rescue operations.

• It is a bilateral naval exercise conducted regularly since 2003.

• It aims to counter maritime threats, promote global peace and stability, and strengthen joint operations.

• It reaffirms India-Russia defence ties, enhances collective maritime security, and underscores India's commitment to a rules-based maritime order.

• The exercise reflects the growing defence partnership between India and Russia, which spans decades and includes joint naval drills, arms trade, and strategic collaborations.

Additional Information

• Chennai

• Chennai is the capital city of Tamil Nadu and hosts the Southern Naval Command.

• The city is significant for maritime activities and houses major ports like Chennai Port and Ennore Port.

• Kochi

• Kochi, located in the state of Kerala, is home to the Southern Naval Command Headquarters.

• It is known for its naval base and the Cochin Shipyard, which is a leading shipbuilding facility in India.

• Kochi is a hub for maritime defense activities but was not selected for INDRA-2025.

• Mumbai

• Mumbai, the capital city of Maharashtra, houses the Western Naval Command Headquarters.

• It is India's largest port city and has significant maritime infrastructure, including the Naval Dockyard.

• Despite its strategic importance, it was not the venue for INDRA-2025.

Q85. Answer: (d) 6

According to the given information,

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

Hence, "Option 4" is the correct answer.

Q86. Answer: (c) Monthly

The Correct answer is Monthly.

Key Points

• The Index of Industrial Production (IIP) is an important statistical tool used to measure the growth and performance of various sectors of the economy such as manufacturing, mining, and electricity.

• The Ministry of Statistics & Programme Implementation (MoSPI) is responsible for the release of the IIP in India.

• The IIP is published on a monthly basis, ensuring timely and regular updates about the performance of the industrial sector.

• The base year for calculating the IIP is currently 2011-12, providing a standardized reference for comparison of industrial activity over time.

• The IIP is a crucial indicator of the economic health of the country and is often used to assess the impact of government policies, economic reforms, and external factors on industrial performance.

• The IIP data is categorized into three main sectors: Manufacturing (77.63%), Mining (14.37%), and Electricity (7.99%), based on their contribution to the index.

• The monthly publication of IIP helps policymakers, economists, and researchers analyze trends and make informed decisions regarding industrial growth and development.

• The frequency of publication ensures that any changes in the industrial output due to factors like seasonality, economic policies, or global market trends are reflected promptly.

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Additional Information

• Half yearly

• Half-yearly reports are typically used for financial and operational analysis by companies and organizations. However, for indices like the IIP, a monthly release is preferred to ensure timely availability of data.

• Weekly

• Weekly frequency is more suitable for indicators like the Wholesale Price Index (WPI) for specific commodities or agricultural produce, rather than broad industrial performance measures like IIP.

• Quarterly

• Quarterly data is commonly used for financial statements, GDP estimates, and other macroeconomic indicators. However, industrial production requires more frequent tracking to capture dynamic changes.

Q87. Answer: (c) 73,000

Shortcut Trick

Let the Cost Price (CP) be 100 units.

Marked Price (MP) = 100 + 64 = 164 units.

Selling Price (SP) = 164 × (100 − 50) ÷ 100 = 82 units.

According to the question, 82 units = Rs. 59,860.

1 unit = 59,860 ÷ 82 = Rs. 730.

Cost Price (100 units) = 100 × 730 = Rs. 73,000.

Therefore The correct answer is Rs. 73,000.

Alternate Method

Given: Markup% = 64%, Discount% = 50%, Selling Price (SP) = Rs. 59,860.

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

=> Let CP be x.

=> MP = x × (164 ÷ 100) = 1.64x.

=> SP = 1.64x × (50 ÷ 100) = 0.82x.

=> 0.82x = 59,860.

=> x = 59,860 ÷ 0.82 = 73,000.

Therefore The correct answer is Rs. 73,000.

Additional Information

Relation between CP and MP

CP ÷ MP = (100 − Discount%) ÷ (100 + Profit%). This ratio helps in finding either CP or MP when the other and margins are known.

Successive Percentage Change

Net change = a + b + (a × b) ÷ 100. Here, a = 64 (markup) and b = −50 (discount). Net Profit% = 64 − 50 − (64 × 50) ÷ 100 = 14 − 32 = −18% (Loss).

Q88. Answer: (d) $25z^2 + 106y^2$

Shortcut Trick

Apply the swapped coefficient identity: $(az - by)^2 + (bz + ay)^2 = (a^2 + b^2)(z^2 + y^2)$.

In the given expression, a = 5 and b = 9, so the first two terms combine as follows:

$(5^2 + 9^2)(z^2 + y^2) = (25 + 81)(z^2 + y^2) = 106z^2 + 106y^2$.

Now, subtract the remaining term: $106z^2 + 106y^2 - 81z^2 = 25z^2 + 106y^2$.

Therefore The correct answer is $25z^2 + 106y^2$.

Alternate Method

Given Expression: $(5z - 9y)^2 + (9z + 5y)^2 - 81z^2$

Formula Used: $(a - b)^2 = a^2 - 2ab + b^2$ and $(a + b)^2 = a^2 + 2ab + b^2$

=> Expand $(5z - 9y)^2$: $(5z)^2 - 2(5z)(9y) + (9y)^2 = 25z^2 - 90zy + 81y^2$

=> Expand $(9z + 5y)^2$: $(9z)^2 + 2(9z)(5y) + (5y)^2 = 81z^2 + 90zy + 25y^2$

=> Combine all terms: $(25z^2 - 90zy + 81y^2) + (81z^2 + 90zy + 25y^2) - 81z^2$

=> Grouping z^2 terms: $25z^2 + 81z^2 - 81z^2 = 25z^2$

=> Grouping y^2 terms: $81y^2 + 25y^2 = 106y^2$

=> Grouping zy terms: $-90zy + 90zy = 0$

=> Final Simplified Expression = $25z^2 + 106y^2$

Therefore The correct answer is $25z^2 + 106y^2$.

Additional Information

Algebraic Identities

Standard identities like $(a + b)^2 = a^2 + 2ab + b^2$ are essential for simplifying polynomial expressions quickly.

Combining Like Terms

Only terms with the exact same variable and exponent (like z^2 or y^2) can be added or subtracted from one another.

Swapped Coefficient Property

The specific form $(ax - by)^2 + (bx + ay)^2$ always results in $(a^2 + b^2)(x^2 + y^2)$ because the 2ab terms cancel out.

Q89. Answer: (a) = NIQ, % = RMU

The logic followed here is:

Given: # : OJR :: QLT : %

Option 1) # = NIQ, % = RMU → NIQ : OJR :: QLT : RMU

Option 2) # = NIQ, % = RNU → NIQ : OJR :: QLT : RNU

Option 3) # = NIQ, % = RMV → NIQ : OJR :: QLT : RMV

Option 4) # = NIR, % = RMU → NIR : OJR :: QLT : RMU

Hence, "Option 1" is the correct answer.

Q90. Answer: (d) Two

Given: M, N, O, S, T and U live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. T lives on the topmost floor.

1) Only three people live between T and N.

2) T lives on the topmost floor.

Floor	Person
6	T
5	
4	
3	
2	N
1	

3) O lives on a floor below N.

4) U lives on an odd numbered floor but not on floor number 5.

Floor	Person
6	T
5	
4	
3	U
2	N
1	O

5) S lives on an even numbered floor.

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

Floor	Person
6	T
5	M

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4	S
3	U
2	N
1	O

Thus, two people live between M and N.

Hence, "Option 4" is the correct answer.

Q91. Answer: (d) E

Given: Seven people, D, E, F, G, Q, R and S, are sitting in a row facing north.

1) No one sits to the left of F.

2) Only four people sit between F and D.

3) Only three people sit to the right of Q.

4) G sits to the immediate left of S.

5) E is not an immediate neighbour of Q.

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

Thus, E sits at the rightmost end of the line.

Hence, "Option 4" is the correct answer.

Q92. Answer: (b) 4 m

Shortcut Trick

In a 30°−60°−90° triangle, the side opposite to the 30° angle is always half of the hypotenuse.

Height = Length of Ladder × sin(30°)

Height = 8 × 1/2 = 4 m.

Therefore The correct answer is 4 m.

Alternate Method

Given:

Length of the ladder (Hypotenuse) = 8 m

Angle of elevation (θ) = 30°

Formula Used:

sin(θ) = Perpendicular / Hypotenuse

Calculations:

=> sin(30°) = Height / 8

=> 1/2 = Height / 8

=> Height = 8 ÷ 2

=> Height = 4 m

Therefore The correct answer is 4 m.

Additional Information

Trigonometric Ratios

Standard values: sin(30°) = 1/2, cos(30°) = √3/2, and tan(30°) = 1/√3.

Pythagoras Theorem

In a right-angled triangle, Hypotenuse² = Base² + Perpendicular².

Special Triangle Ratio

In a 30°−60°−90° triangle, the sides are in the ratio 1 : √3 : 2.

Q93. Answer: (d) Art

The Correct answer is Art.

Key Points

• Shekhar Kapur is a renowned Indian filmmaker and actor known for his significant contributions to the world of cinema and visual arts.

• He gained international acclaim for directing the historical films “Elizabeth” (1998) and its sequel “Elizabeth: The Golden Age” (2007).

• His critically acclaimed films include “Bandit Queen” (1994), based on the life of Phoolan Devi, and “Masoom” (1983), marking his debut as a director.

• Shekhar Kapur has been recognized for his creative storytelling, exceptional cinematic techniques, and impactful portrayal of complex characters.

• He received the Padma Bhushan in 2025, India's third-highest civilian award, for his outstanding work in the field of Art, particularly in filmmaking and visual storytelling.

• His contributions have greatly enriched the global film industry, bridging the gap between Indian and international cinema.

Additional Information

• Science

• The field of science involves systematic studies of the structure and behavior of the physical and natural world through observation and experimentation.

• While Shekhar Kapur has demonstrated creativity and innovation, his expertise lies in filmmaking and not in the domain of scientific research or discovery.

• Medicine

• Medicine is a field concerned with the diagnosis, treatment, and prevention of diseases.

• Shekhar Kapur has no known contributions or achievements in the field of medicine.

• Literature

• Literature refers to written works, especially those considered of superior or lasting artistic merit.

• Although storytelling is a part of Shekhar Kapur’s work as a filmmaker, his primary contributions are in the realm of visual storytelling and not written literature.

Q94. Answer: (a) The Name Box

The Correct answer is The Name Box

Key Points

• The Name Box is an essential element of the MS Excel interface.

• It is located near the top-left corner of the Excel window, just above the spreadsheet grid.

• The Name Box displays the name or reference of the currently active cell (e.g., A1, B2) or the selected range of cells.

• Users can use the Name Box to navigate directly to a specific cell by entering the cell reference and pressing Enter.

• It also allows users to assign names to ranges, making data management and formula creation easier.

• The Name Box helps in identifying the active cell quickly, which is essential for performing operations like entering data or writing formulas.

• This feature is particularly useful in large datasets where navigating and identifying specific cells might be challenging.

Additional Information

• The Status Bar

• The Status Bar is located at the bottom of the Excel window.

• It provides information about current actions, such as the sum, average, or count of selected cells.

• It does not display the name of the active cell; instead, it shows status messages and quick calculations.

• The Ribbon

• The Ribbon is the menu interface located at the top of Excel.

• It contains tabs like Home, Insert, Page Layout, Formulas, etc., which house various tools and commands.

• The Ribbon is used for performing tasks like formatting, chart creation, and applying formulas, but it doesn’t display cell references.

• The Formula Bar

• The Formula Bar is located directly below the Ribbon.

• It displays the contents of the active cell, including formulas and data.

• While it shows the data in the cell, it does not display the cell reference like the Name Box does.

Q95. Answer: (d) Neither conclusion (I) nor (II) follows.

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

Conclusions:

(I) All big are trucks → Does not follow (As all trucks are big. So it is possible but not definite.)

(II) All cars are big → Does not follow (As all big are cars. So it is possible but not definite.)

Therefore Here, Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 4".

Q96. Answer: (d) 10^(th)

The Correct answer is 10th.

Key Points

• The Climate Change Performance Index (CCPI) is published annually by Germanwatch, New Climate Institute, and Climate Action Network International.

• The index evaluates and ranks countries based on their efforts to combat climate change, considering criteria such as GHG emissions, renewable energy adoption, energy use, and climate policy.

• India has secured the 10th rank in the CCPI for 2025, showcasing its significant progress in renewable energy implementation and efforts to meet its climate commitments under the Paris Agreement.

• This ranking indicates India's proactive approach in addressing climate change challenges while balancing its developmental needs.

• India's policies such as the National Action Plan on Climate Change (NAPCC) and initiatives like solar energy expansion through the International Solar Alliance have contributed to this improvement in ranking.

• India also stands out for its ambitious targets, such as achieving 50% installed electricity capacity from non-fossil fuel-based energy sources by 2030.

• The CCPI does not rank any country in the top three positions, as no country has yet demonstrated a performance that meets the requirements to limit global warming to 1.5°C.

• India's positioning reflects its commitment to sustainable development while tackling environmental challenges effectively.

Additional Information

• Germanwatch

• Germanwatch is a non-governmental organization based in Bonn, Germany.

• It focuses on global equity and sustainability, especially in the context of climate change and trade policies.

• Germanwatch collaborates with various international bodies to publish the Climate Change Performance Index (CCPI).

• New Climate Institute

• New Climate Institute is a research organization based in Cologne, Germany.

• It specializes in analyzing and developing policies to address climate change and supports countries in achieving their climate goals.

• Climate Action Network International

• Climate Action Network International is a global network of over 1,500 organizations working to promote climate action.

• It aims to limit global warming to 1.5°C by advocating for stronger climate policies and international cooperation.

Q97. Answer: (d) 216 cm^3

Shortcut Trick

For a cube, if TSA = $6a^2$ and Volume = a^3.

When TSA = 216, then $6a^2 = 216 \Rightarrow a^2 = 36 \Rightarrow a = 6$ cm.

Volume = $6^3 = 216$ cm^3.

Note: For a cube, if TSA is 216, the numerical value of volume is also 216.

Therefore The correct answer is 216 cm^3.

Alternate Method

Given: Total Surface Area (TSA) of the cube = 216 cm^2.

Formula Used:

1) Total Surface Area of cube = 6 × $(side)^2$

2) Volume of cube = $(side)^3$

Calculations:

$\Rightarrow 6 \times a^2 = 216$

$\Rightarrow a^2 = 216 \div 6$

$\Rightarrow a^2 = 36$

$\Rightarrow a = \sqrt{36}$

$\Rightarrow a = 6$ cm

$\Rightarrow$ Volume = $a^3 = 6 \times 6 \times 6$

$\Rightarrow$ Volume = 216 cm^3

Therefore The correct answer is 216 cm^3.

Additional Information

Lateral Surface Area (LSA)

The area of the four vertical faces of the cube, calculated as $4 \times a^2$.

Diagonal of a Cube

The longest rod that can be placed inside a cube of side 'a' is $a\sqrt{3}$.

Relation between TSA and Volume

Numerically, TSA = Volume only when the side of the cube is exactly 6 units.

Q98. Answer: (a) Electric three-wheelers used for personal use

The Correct answer is Electric three-wheelers used for personal use.

Key Points

• The PM E-DRIVE Scheme is a government initiative aimed at promoting the adoption of electric vehicles (EVs) in India.

• Under this scheme, incentives are provided to reduce the cost of eligible electric vehicles to encourage their use and reduce carbon emissions.

• Electric three-wheelers used for personal use are not eligible for demand incentives under the scheme.

• The scheme primarily focuses on promoting electric vehicles for commercial and public utility purposes, ensuring maximum impact on reducing pollution and increasing adoption of EVs.

• Commercial vehicles, such as electric three-wheelers for goods transport, and electric two-wheelers with advanced batteries are given priority because they contribute more effectively to reducing fuel consumption and emissions.

• This exclusion ensures that the limited funds allocated for subsidies are utilized for vehicles that have a significant impact on environmental sustainability and energy efficiency.

• The policy aligns with the broader objectives of the government to promote sustainable transportation and achieve the goals of reducing greenhouse gas emissions under international climate agreements.

Additional Information

• Electric two-wheelers with advanced batteries

• These vehicles are equipped with lithium-ion batteries or other advanced technologies for better performance, longer range, and faster charging times.

• They are eligible for demand incentives under the scheme as they are widely used and contribute to reducing dependency on fossil fuels.

• These vehicles are considered cost-effective for individual users and play a significant role in transitioning to green transportation.

• Electric three-wheelers for commercial use

• These vehicles are designed for commercial transport, such as carrying goods or passengers, and are eligible for subsidies under the scheme.

• They contribute to reducing pollution in urban areas and are an essential part of last-mile connectivity solutions.

• Encouraging their adoption aligns with the goals of improving urban transportation efficiency.

• Electric trucks with valid scrapping certificates

• These vehicles qualify for incentives if they meet the scrapping policy requirements set by the government.

• The scrapping certificate ensures that old, polluting vehicles are replaced with new, environmentally friendly electric trucks.

• Electric trucks are crucial for reducing emissions in the logistics and freight sectors.

Q99. Answer: (a) (6, 8)

Shortcut Trick

The centroid of a triangle is the arithmetic mean of the coordinates of its three vertices.

x-coordinate = (1 + 7 + 10) ÷ 3 = 6

y-coordinate = (4 + 8 + 12) ÷ 3 = 8

Therefore The correct answer is (6, 8).

Alternate Method

Given: Vertices of the triangle are A(1, 4), B(7, 8), and C(10, 12).

Formula Used: The coordinates of the centroid G(x, y) of a triangle with vertices (x1, y1), (x2, y2), and (x3, y3) are given by:

G(x, y) = ((x1 + x2 + x3)/3, (y1 + y2 + y3)/3)

Calculations:

=> x = (1 + 7 + 10) ÷ 3

=> x = 18 ÷ 3 = 6

=> y = (4 + 8 + 12) ÷ 3

=> y = 24 ÷ 3 = 8

Therefore The correct answer is (6, 8).

Additional Information

Centroid Definition

The centroid is the point where the three medians of a triangle intersect. It is the geometric center of the triangle.

Median Ratio Property

The centroid divides each median in the ratio 2 : 1, measured from the vertex to the midpoint of the opposite side.

Area Property

The three medians divide the triangle into six smaller triangles, all of which have equal area.

Q100. Answer: (d) Group VII

The correct answer is Group VII.

Key Points

• Iodine belongs to Group VII in Mendeleev's periodic table, which is the group of halogens.

• Mendeleev's periodic table was arranged based on the atomic mass of elements, and elements with similar properties were placed in the same group.

• Group VII in Mendeleev's table includes elements like fluorine, chlorine, bromine, iodine, and astatine.

• Halogens are known for their strong reactivity and their ability to form salts when combined with metals.

• Iodine is a non-metallic element and is known for its role in the synthesis of thyroid hormones in the human body.

• Mendeleev predicted the properties of elements that were not discovered during his time and left gaps in his periodic table for them.

• The placement of iodine in Group VII was based on its properties aligning with other halogens, despite slight inconsistencies in atomic mass trends.

Additional Information

• Group VIII

• Group VIII in Mendeleev's table includes elements like iron, cobalt, and nickel.

• These elements are transition metals and are known for their ability to form alloys and their magnetic properties.

• Group V

• Group V includes elements such as nitrogen, phosphorus, arsenic, antimony, and bismuth.

• These elements exhibit a wide range of properties, from non-metals (like nitrogen) to metalloids (like arsenic) and metals (like bismuth).

• Group VI

• Group VI includes elements such as oxygen, sulfur, selenium, tellurium, and polonium.

• These elements are known as chalcogens and are essential for various biological and industrial processes.

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