RRB NTPC Graduate Level CBT-I Official Paper (Held On: 17 Jun, 2025 Shift 2) (Previous Year Paper)

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

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

(a) JNP
(b) JMO
(c) JNO
(d) JMP

Q2. What is the full form of CD, commonly used in storage devices?

(a) Computer Disk
(b) Compact Data
(c) Compact Disc
(d) Circuit Drive

Q3. The title name 'Rani Gaidinliu' was given to the Naga revolt leader Gaidinliu Pamei by which political leader?

(a) Jawaharlal Nehru
(b) Sarojini Naidu
(c) Mahatma Gandhi
(d) Sardar Vallabhbhai Patel

Q4. 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 :: ?

: HNV :: GVO : %

(a) # = FNW, % = QHT
(b) = DMU, % = SWT
(c) = FMU, % = IWP
(d) # = DNU, % = JHS

Q5. Which of the following numbers is divisible by 41?

(a) 9430
(b) 10113
(c) 9249
(d) 9879

Q6. 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. E lives on an even numbered floor but not 4. The sum of floors on which E and F live is 9. Only 3 people live between C and A. The sum of floors on which B and A live is 3. How many people live above B?

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

Q7. Select the set in which the numbers are related in the same way as are the numbers of the following sets. (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(22, 28, 31)

(39, 45, 48)

(a) (53, 59, 65)
(b) (44, 47, 50)
(c) (27, 33, 36)
(d) (17, 20, 26)

Q8. What should come in place of the question mark (?) in the given series?

211, 198, 175, 142, 99, ?

(a) 56
(b) 47
(c) 57
(d) 46

Q9. Which of the following is a part of the secondary sector in India?

(a) Teaching
(b) Weaving cotton fabric
(c) Farming
(d) Fishing

Q10. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(NOTE: All numbers are single digit numbers only.) (Left) © © 4 3 5 6 7 # * 1 3 % 9 2 7 5 9 & £ @ 7 * (Right)

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

(a) 5
(b) 6
(c) 7
(d) 8

Q11. Indira Point, the southernmost tip of India, is located on which island?

(a) Little Nicobar Island
(b) Nancowry Island
(c) Great Nicobar Island
(d) Car Nicobar Island

Q12. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(NOTE: All numbers are single digit numbers only.) (Left) @ 9 7 8 2 @ @ 9 3 * 2 6 2 © # 9 & 7 8 9 @ 4 (Right)

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

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

Q13. Which Princely State had a representative assembly from as early as 1881?

(a) Mysore
(b) Patiala
(c) Hyderabad

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(d) Gwalior

Q14. In MS Excel, which feature ensures that only a specified portion of the spreadsheet is printed?

(a) Print Area
(b) Page Orientation
(c) Margin Settings
(d) Page Break Preview

Q15. Govind bought two items at a total cost of Rs. 4,800. He sold one item at 34% profit and the other at 10% loss. If Govind sold both the items together for Rs. 5,442, then what is the difference between the cost price (in Rs.) of both the items?

(a) 300
(b) 275
(c) 350
(d) 325

Q16. In a certain code language, 'SING' is coded as '9137' and 'TURN' is coded as '8496'. What is the code for 'N' in the given code language?

(a) 3
(b) 6
(c) 9
(d) 7

Q17. A is married to E. E is the sister of R. R is married to D. D is the only brother of Z. B is the only daughter of R. How is A related to B?

(a) Mother's sister's husband
(b) Mother's sister's father
(c) Mother's brother's wife
(d) Father's sister's husband

Q18. If the discriminant of quadratic equation is negative, then the roots are:

(a) real and negative
(b) real and distinct
(c) complex conjugates
(d) real and equal

Q19. What is the median of the following distribution?

Class	140-190	190-240	240-290	290-340	340-390
Frequency	23	13	24	25	35

(a) 290
(b) 278
(c) 301
(d) 304

Q20. For a regular polygon, the sum of the interior angles is 50% more than the sum of its exterior angles. Each interior angle of the polygon measures x°. What is the value of x?

(a) 108
(b) 96
(c) 112
(d) 88

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Q21. Which of the following are the key factors that are favourable for India for making it a key destination for foreign investments?

1. India’s robust economic fundamentals
2. Ongoing structural reforms
3. Decreasing consumer market position

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

Q22. What was Ashoka's relation to Bindusara?

(a) Grandson
(b) Son
(c) Brother
(d) Brother-in-law

Q23. According to INEP Emissions Gap Report 2024, what annual reduction in emissions is required until 2035 to limit global warming to 1.5°C?

(a) 3.5%
(b) 10%
(c) 5.5%
(d) 7.5%

Q24. Who was the skipper of the Mumbai Indians team that won the Women's Premier League (WPL) 2025 title?

(a) Harmanpreet Kaur
(b) Mithali Raj
(c) Jhulan Goswami
(d) Smriti Mandhana

Q25. Find the circumference (in m) of the largest circle that can be inscribed in a rectangle whose dimensions are given as 112 m and 281 m.

Take $\pi = 22/7$

(a) 354
(b) 342
(c) 352
(d) 348

Q26. Nick, Kevin, and Joe can finish a certain piece of work in 3, 9, and 27 days respectively. All three of them started the work together. Nick left after working for 1 day, and Kevin left 2 days before the work was completed. Find the total number of days taken to complete the work.

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

Q27. Dhiraj starts from Point Y and drives 22 km towards the east. He then takes a right turn, drives 33 km, turns left and drives 25 km. He then takes a left turn and drives 51 km. He takes a left turn, drives 47 km. He then turns left, drives 23 km and stops at Point Z. How far (shortest distance) and towards which direction should he drive in order to reach Point Y again? (All turns are 90-degree turns only unless specified.)

(a) 7 km towards the south
(b) 5 km towards the north
(c) 7 km towards the north
(d) 5 km towards the east

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Q28. What positive value of X satisfies the equation X/176 = 99/X?

(a) 133
(b) 132
(c) 130
(d) 135

Q29. Who among the following has the authority to specify an urban area as a 'large urban area' or a 'small urban area' or a 'transitional area' in a state?

(a) President of India
(b) Chief Justice of the State's High Court
(c) Chief Minister of the State
(d) Governor of the State

Q30. How does the President of India exercise his/her executive functions with respect to decision-making?

(a) The President considers the advice of the Prime Minister and the Union council of ministers.
(b) The President can repeatedly ask for reconsideration of any ministerial decision until satisfied.
(c) The President acts entirely on his own absolute discretion
(d) The President acts independently of the Union Government for foreign affairs.

Q31. A bank offers 1.1% compound interest per annum calculated on a half-yearly basis. A customer deposits Rs. 7,745 each on 1 January and 1 July of a year. At the end of the year, the amount he would have gained by way of interest is _____. (Rounded up to the 2 decimal places.)

(a) Rs. 128.03
(b) Rs. 131.93
(c) Rs. 109.99
(d) Rs. 121.87

Q32. A train P going at the speed of 78 km/hr completely passes train Q of length 120 m, going in the same direction on parallel tracks, at 62 km/hr, in 4.5 minutes. How much time (in seconds) will P take to cross completely train R of length 245 m, going at 81 km/hr in the opposite direction?

(a) 28
(b) 15
(c) 49
(d) 30

Q33. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the letter-cluster pair that DOES NOT belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) NP - RL
(b) EF - CD
(c) CD - AB
(d) IJ - GH

Q34. The mode of the observations 8, 7, 4, 7, 9, 4, 5, 4, 7, 2, 4, 5, 8, 5, 4 and 5 is:

(a) 4
(b) 7
(c) 2
(d) 8

Q35. Who is the Chairperson of Lokpal as of April 2025 in India?

(a) Justice L Narayana Swamy
(b) Justice Ritu Raj Awasthi
(c) Justice Ajay Manik Rao Khanwilkar
(d) Justice Sanjay Yadav

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Q36. What motion is responsible for the generation of waves in a string?

(a) Non-accelerating translational motion
(b) Rectilinear motion
(c) Periodic oscillatory motion
(d) Random motion

Q37. Which secret society founded by Vinayak Damodar Savarkar promoted armed revolution against the British rule?

(a) Hindustan Socialist Republican Association
(b) Abhinav Bharat
(c) Anushilan Samiti
(d) Ghadar Party

Q38. If 1 is added to each even digit and 2 is subtracted from each odd digit in the number 37246895, how many digits will appear more than once in the new number thus formed?

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

Q39. Between 2013-14 and 2022-23, how many Indians escaped multidimensional poverty, according to NITI Aayog?

(a) 24.82 crore
(b) 30.5 crore
(c) 12.5 crore
(d) 18.2 crore

Q40. What should come in place of the question mark (?) in the given series? 2 9 23 51 107 ?

(a) 219
(b) 214
(c) 221
(d) 224

Q41. In a regular polygon with n sides, the sum of the interior angles is 1800°. What is the number of sides (n) of the polygon?

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

Q42. A vendor sells 8, 12, 10, 14, and 6 mangoes over five days. What is the average number of mangoes sold per day?

(a) 14
(b) 8
(c) 10
(d) 12

Q43. A person saves 30% of his income. If his expenditure is Rs. 840, then his income (in Rs.) is:

(a) 252
(b) 1,200
(c) 588
(d) 1,240

Q44. A company produces two products A and B with prices of Rs. 156 and Rs. 220, respectively. If 55% of the products sold are A and 45% of the products sold are B. Find the weighted average price?

(a) Rs. 184.80
(b) Rs. 174.60
(c) Rs. 165.30

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(d) Rs. 169.50

Q45. Which international entity has partnered with India to launch joint research initiatives aimed at tackling marine plastic litter and developing waste-to-hydrogen technologies?

(a) World Economic Forum (WEF)
(b) European Union (EU)
(c) United Nations Industrial Development Organization (UNIDO)
(d) G7 Environment Council

Q46. Three persons X, Y, and Z started a business with their shares in the ratio 3 : 4 : 10. After 6 months, Y withdrew his 50% share, while Z withdrew his 40% share 9 months prior to completion of the year. If the total profit at the end of the year is Rs. 23,400, find the share of Z (in Rs.) in the profit.

(a) 12,559
(b) 12,510
(c) 12,600
(d) 12,366

Q47. Which of the following Directive Principles is mentioned in Article 43B of the Constitution of India?

(a) Uniform civil code for the citizens
(b) Organisation of agriculture and animal husbandry
(c) Promotion of co-operative societies
(d) Equal justice and free legal aid

Q48. Consider the following statements regarding Exercise Tiger Triumph – 25, which was conducted in April 2025.

1. It was a bilateral Tri-Service Humanitarian Assistance and Disaster Relief (HADR) exercise between India and the United Kingdom.

2. The Harbour Phase of the exercise was scheduled at Visakhapatnam, while the Sea Phase and HADR operations were conducted off Kakinada.

3. Indian participation included INS Vikrant along with other Army and Air Force contingents.

4. The exercise aimed to develop interoperability and formulate SOPs for a Combined Coordination Centre during joint operations.

Which of the above statements are correct?

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

Q49. A, B and C alone can do a piece of work in 5, 55 and 66 days, respectively. They all started the work together, but A left after 4 days. In how many days was the whole work completed?

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

Q50. Kumudini Rajnikant Lakhia was honoured with the Padma Vibhushan in 2025 for her contribution in which field?

(a) Public Affairs
(b) Sports
(c) Arts
(d) Medicine

Q51. On simple interest, a certain sum of money amounts to Rs. 1,250 in 2 years and to Rs. 2,000 in 4 years. Find the rate of interest per annum.

(a) 85%
(b) 80%
(c) 75%

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(d) 70%

Q52. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 7235614, then which of the following digits will be second from the left?

(a) 0
(b) 2
(c) 7
(d) 4

Q53. The population of a town in 1930 was 3,48,000. If its population increased in two successive decades by 95% in each decade, the population of the town in 1950 was:

(a) 13,23,270
(b) 13,23,267
(c) 13,23,272
(d) 13,23,273

Q54. Among the following cities, which is closest to the Prime Meridian?

(a) Ahmedabad
(b) Agartala
(c) Kanyakumari
(d) Delhi

Q55. 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 :: ?

: RWS :: INJ : %

(a) = UZV, % = FKG
(b) = NGV, % = FLP
(c) # = CDR, % = KJI
(d) = PIV, % = MJU

Q56. What is the maximum imprisonment term that a Chief Judicial Magistrate can award?

(a) 3 years
(b) 10 years
(c) Life imprisonment
(d) 7 years

Q57. The sum of two positive numbers x and y (where x > y) is 15 and their product is 36. Find the difference between the number x and y.

(a) 9
(b) 12
(c) 8
(d) 10

Q58. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements: All sparrows are parrots. All parrots are macau. Some sparrows are dove.

Conclusions: (I) Some sparrows are macau. (II) Some doves are parrots.

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

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Q59. Which of the following statements is correct regarding the Supreme Court's ruling in 'Urmila Dixit vs Sunil Sharan Dixit (January 2025)' related to the interpretation of the Maintenance and Welfare of Parents and Senior Citizens Act, 2007?

(a) The Madhya Pradesh High Court ruling was upheld by the Supreme Court.
(b) The Supreme Court ruled that a gift deed without a written maintenance clause can never be cancelled
(c) The Court held that tribunals under the 2007 Act cannot order possession to be transferred to senior citizens.
(d) Section 23 of the Act allows the tribunals to cancel a property transfer if basic amenities are not provided.

Q60. Which aircraft's midlife upgrade is a highlight at DRDO's outdoor display in Aero India 2025?

(a) Tejas
(b) Sukhoi-30
(c) Dornier
(d) Jaguar

Q61. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 7648135, then what will the difference between the digits that are second from the left and second from the right in the new number thus formed be?

(a) −2
(b) −1
(c) 0
(d) 1

Q62. Three numbers are in the ratio 2 : 7 : 13, and their LCM is 3094. Their HCF is ____.

(a) 18
(b) 9
(c) 20
(d) 17

Q63. Harishena was the court poet of:

(a) Skandagupta
(b) Chandragupta I
(c) Chandragupta II
(d) Samudragupta

Q64. Where did Max Verstappen clinch his fourth Formula 1 World Championship?

(a) Las Vegas
(b) Miami
(c) Indianapolis
(d) Austin

Q65. In a certain code language, 'HUNT' is coded as '6438' and 'USER' is coded as '5723'. What is the code for 'U' in the given code language?

(a) 5
(b) 4
(c) 7
(d) 3

Q66. Mr. Wax starts from Point A and drives 14 km towards the north. He then takes a right turn, drives 9 km, turns right and drives 7 km. He then takes a left turn, drives 3 km, turns right and drives 11 km. He then takes a right turn and drives 15 km. He takes a final right turn, drives 4 km and stops at Point P. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified)

(a) 5 km to the east
(b) 2 km to the west
(c) 3 km to the east
(d) 4 km to the west

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Q67. 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) BZ – KF
(b) IG – RL
(c) RP – AU
(d) NL – WQ

Q68. The largest monolithic rock structure in the world, the Kailasa Temple, is situated in which of the following caves?

(a) Bagh caves
(b) Junagadh caves
(c) Ellora caves
(d) Ajanta caves

Q69. $(\sec\theta - \tan\theta)/(\sec\theta + \tan\theta) = 3/5$, then $2\sin\theta$ is equal to

(a) 1/8
(b) 1/2
(c) 1/4
(d) 1

Q70. Seven boxes, D, E, F, G, S, T and U, are kept one over the other but not necessarily in the same order. Only two boxes are kept below T. Only one box is kept above U. Only one box is kept between U and D. G is kept immediately above S. F is kept at some place below E. How many boxes are kept between E and G?

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

Q71. VH 14 is related to YJ 7 in a certain way. In the same way, PI 18 is related to SK 11. To which of the given options is SU 4 related, following the same logic?

(a) VW −3
(b) XR −5
(c) MR −9
(d) NT −7

Q72. A retailer allows a 22% discount on the marked price. What should be the marked price (in Rs.) of an item whose cost price is Rs. 546, in order to make a profit of 60%?

(a) 1,120
(b) 1,122
(c) 1,118
(d) 1,123

Q73. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.

RLY TNS VPM XRG ?

(a) ZUZ
(b) ZTA
(c) ZUA
(d) ZTZ

Q74. What is the major reason behind higher road density in Kerala compared to Rajasthan?

(a) Higher Gross Domestic Products
(b) Mineral distribution
(c) Topography and population density
(d) Availability of land

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Q75. A, B, C, D, R, S and T are sitting around a circular table facing the centre of the table.T sits to the immediate right of D. Only three people sit between T and S when counted from the left of T. Only three people sit between D and C. A sits to the immediate right of R. How many people sit between B and R when counted from the left of R?

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

Q76. Find a single discount equal to three consecutive discounts of 20%, 13% and 20%.

(a) 44.95%
(b) 42.74%
(c) 48.08%
(d) 44.32%

Q77. Ansh, Kautuk, Swati, Vansh, Navya, Deepak and Rani are sitting around a circular table, facing the centre. Kautuk sits second to the right of Swati. Vansh sits to the immediate left of Ansh. Ansh sits second to the left of Swati. Navya sits third to the right of Rani. Who sits third to the left of Deepak?

(a) Vansh
(b) Rani
(c) Navya
(d) Ansh

Q78. In January 2025, National Tourism Day was celebrated with which of the following themes?

(a) Tourism for Rural Revival
(b) Tourism for Inclusive Growth
(c) Tourism for Equal Progress
(d) Tourism for Sustainable Future

Q79. In the context of Local Area Networks (LANs), what is the primary purpose of a MAC (Media Access Control) address?

(a) To define the physical layout and cabling of the network
(b) To uniquely identify a network interface controller (NIC) at the data link layer
(c) To specify the network protocol being used for communication
(d) To provide a logical address for network routing

Q80. If a : b :: b : c; c = 25a and b = 20, find the positive value of c

(a) 98
(b) 99
(c) 100
(d) 101

Q81. A solid hemisphere has a radius of 16 cm. Find its total surface area.

(a) 768π cm^2
(b) 761π cm^2
(c) 760π cm^2
(d) 764π cm^2

Q82. The cost of 8 pens and 2 pencils is Rs. 96 and the cost of 4 pens and 7 pencils Rs. 72. The cost of 2 pens and 8 pencils is :

(a) Rs. 55
(b) Rs. 56
(c) Rs. 54
(d) Rs. 53

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Q83. As per the Global Gender Gap Report, 2024, what percentage of the gender gap has India closed?

(a) 60.1%
(b) 66.3%
(c) 64.1%
(d) 62.5%

Q84. Which of the following is a National Park in Rajasthan?

(a) Kaziranga National Park
(b) Ranthambore National Park
(c) Sundarbans National Park
(d) Jim Corbett National Park

Q85. CMOS, often associated with storing system configuration, stands for:

(a) Computerised Main Operating System
(b) Central Memory Output System
(c) Configurable Modular Operating Software
(d) Complementary Metal-Oxide Semiconductor

Q86. What is the name of the pillared hall at the front of a Hindu temple where devotees gather?

(a) Garbhagriha
(b) Amalaka
(c) Mandapa
(d) Antarala

Q87. Namita travels a certain distance at a speed of 88 km/hr and double the earlier distance at 16 km/hr. She then returns to the starting point through the same route. If her average speed for the entire journey is 33 km/hr, then what is her speed (in km/hr) for the return journey?

(a) 66
(b) 65.4
(c) 64
(d) 71.2

Q88. Which enzyme, secreted by the chief cells of the stomach, is crucial for initiating the digestion of proteins?

(a) Gastric lipase
(b) Trypsinogen (converted to trypsin)
(c) Pepsinogen (converted to pepsin)
(d) Amylase

Q89. Find the value of √0.04/√0.0004:

(a) 10
(b) 29
(c) 21
(d) 18

Q90. Find the simplified value of [160 ÷ {30 + 7 × (2 - 6)}].

(a) 85
(b) 78
(c) 80
(d) 79

Q91. How do we customise bullets in MS Word?

(a) View → Zoom
(b) Layout → Margins
(c) Home → Bullets → Define New Bullet
(d) Insert → Picture

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Q92. Not all regions in India equally benefited from the Green Revolution. Which of the following states was least impacted by the first phase of the Green Revolution?

(a) Haryana
(b) Uttar Pradesh
(c) Orissa
(d) Punjab

Q93. 4 This question is based on the five, three-digit numbers given below. (Left) 815 497 460 637 147 (Right) (Example- 697 – First digit = 6, second digit = 9 and third digit = 7) (NOTE: All operations to be done from left to right.) What will be the resultant if the second digit of the highest number is subtracted from the third digit of the lowest number?

(a) 9
(b) 5
(c) 6
(d) 7

Q94. According to CRISIL's Infrastructure Yearbook 2023, what is the total projected infrastructure spending in India over the next seven years?

(a) Rs. 95 lakh crore
(b) Rs. 110 lakh crore
(c) Rs. 143 lakh crore
(d) Rs. 160 lakh crore

Q95. Which Indian state's/Union Territory's government has announced its Electric Vehicle (EV) Policy 2.0 to reduce air pollution in the region?

(a) Assam
(b) Delhi
(c) Uttar Pradesh
(d) Chandigarh

Q96. Seven boxes, A, B, C, D, E, F and G, are kept one over the other, but not necessarily in the same order. Only three boxes are kept below B. Only two boxes are kept between B and A. Only C is kept immediately above E. D is kept at some place below F and at some place above G. How many boxes are kept above F?

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

Q97. If 2 is added to each odd digit and 1 is subtracted from each even digit in the number 7526318, what will be the difference between the highest and lowest digits in the number thus formed?

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

Q98. In a certain code language, 'CART' is coded as '4268' and 'RISE' is coded as '3527'. What is the code for 'R' in the given code language?

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

Q99. HT 17 is related to GQ 6 in a certain way. In the same way, LX 9 is related to KU -2. To which of the given options is QR 6 related, following the same logic?

(a) QR -7
(b) QQ -7
(c) PO -5

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(d) PQ -5

Q100. Which of the following medicines discovered by Paul Ehrlich became the first successful treatment for syphilis?

(a) Salvarsan
(b) Prontosil
(c) Erythromycin
(d) Penicillin

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) JMO

The logic followed here is:
Thus, the missing term in the series is JMO.
Hence, the correct answer is "Option 2";

Q2. Answer: (c) Compact Disc

The correct answer is Compact Disc.
Key Points
• CD stands for Compact Disc, which is a digital optical disc storage format.
• It was originally developed by Philips and Sony in 1982 for storing and playing music.
• Compact Discs are used for storing various types of digital data, including audio, video, and software programs.
• A standard CD has a storage capacity of approximately 700 MB or 80 minutes of audio.
• CDs use a laser to read data encoded in the form of tiny indentations (pits) on the disc surface.
Additional Information
• History of CDs
• The first commercial Compact Disc was released in 1982 and featured the album "52nd Street" by Billy Joel.
• CD technology revolutionized how music and data were stored and distributed during the 1980s and 1990s.
• Types of CDs
• CD-ROM: Read-only memory discs used for data storage.
• CD-R: Recordable discs that allow data to be written once.
• CD-RW: Rewritable discs that allow data to be erased and rewritten multiple times.
• How CDs Work
• Data is stored in the form of microscopic pits and lands on the reflective surface of the disc.
• A laser beam reads the data by detecting changes in reflection caused by pits and lands.
• Decline of CDs
• With the rise of USB drives, cloud storage, and streaming platforms, CDs have become less popular.
• However, they are still used in some industries and for archival purposes.

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Q3. Answer: (a) Jawaharlal Nehru

The correct answer is Jawaharlal Nehru.

Key Points

• Rani Gaidinliu was a Naga spiritual and political leader who led a revolt against British colonial rule in India.

• She was given the title "Rani" by Jawaharlal Nehru for her bravery and leadership in the freedom movement.

• Jawaharlal Nehru recognized her efforts and contributions to Indian independence and referred to her as the "Rani" of her people.

• Gaidinliu was a staunch advocate for the rights of her people and opposed British policies that marginalized tribal communities.

• She was imprisoned for her revolutionary activities and remained a symbol of resistance against oppression.

Additional Information

• Gaidinliu Movement: Rani Gaidinliu led the Heraka religious movement among the Zeliangrong Naga tribes, which also served as a medium for anti-colonial resistance.

• Recognition: In post-independence India, she was awarded the Padma Bhushan in 1982 for her contributions to the nation.

• Legacy: The Government of India issued a commemorative stamp in her honor in 1996 and established a museum dedicated to her life and work.

• Heraka Religion: The movement aimed at reviving the traditional religious practices of the Naga people and opposing forced conversions to Christianity during colonial rule.

• Imprisonment: Rani Gaidinliu was jailed for 14 years by the British, but her resilience made her a legendary figure in India's freedom struggle.

Q4. Answer: (c) = FMU, % = IWP

Given:

: VXB :: GIM : %

Analysis of Options:

Option 1) # = SUY, % = LLP

For # (SUY) to VXB

The pattern derived from SUY to VXB is: (+3, +3, +3).

For GIM to % (LLP)

The pattern derived from GIM to LLP is: (+5, +3, +3).

Option 2) # = SEY, % = JLP

For # (SEY) to VXB

The pattern derived from SEY to VXB is: (+3, +19, +3).

For GIM to % (JLP)

The pattern derived from GIM to JLP is: (+3, +3, +3).

Option 3) # = SUY, % = JLP

For # (SUY) to VXB

The pattern derived from SUY to VXB is: (+3, +3, +3).

For GIM to % (JLP)

The pattern derived from GIM to JLP is: (+3, +3, +3).

Since the pattern for SUY to VXB (+3, +3, +3) is the same as the pattern for GIM to JLP (+3, +3, +3), Option 3 is correct.

Option 4) # = SUY, % = JLL

For # (SUY) to VXB

The pattern derived from SUY to VXB is: (+3, +3, +3).

For GIM to % (JLL)

The pattern derived from GIM to JLL is: (+3, +3, -1).

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

Hence, the correct answer is "Option 3".

Q5. Answer: (a) 9430

Shortcut Trick

To check divisibility by 41, use the osculator 4 (negative).

Rule: Subtract 4 × (last digit) from the remaining number.

For 9430: 943 − (4 × 0) = 943 → 94 − (4 × 3) = 94 − 12 = 82.

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Since 82 is 2 × 41, the number is divisible.

Therefore The correct answer is 9430.

Alternate Method

Given: Numbers 9430, 10113, 9249, 9879.

Method: Perform direct division for each option to identify the remainder.

=> Option (1): 9430 ÷ 41

=> 9430 = (41 × 200) + 1230

=> 1230 = 41 × 30

=> 9430 = 41 × (200 + 30) = 41 × 230 (Remainder = 0)

=> Option (2): 10113 ÷ 41 = 246 remainder 27

=> Option (3): 9249 ÷ 41 = 225 remainder 24

=> Option (4): 9879 ÷ 41 = 240 remainder 39

Therefore The correct answer is 9430.

Additional Information

Divisibility by 41 (Vedic Math)

For a number to be divisible by 41, the result of (Remaining digits − 4 × Last digit) must be 0 or a multiple of 41.

Prime Numbers near 41

41 is a Sophie Germain prime because 2 × 41 + 1 = 83 is also a prime number.

Divisibility of 37 and 41

Any 5-digit number with all same digits (e.g., 55555) is always divisible by 41 because 11111 = 41 × 271.

Q6. Answer: (b) 4

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.

1) E lives on an even numbered floor but not 4.

Possible even floors for E are 2 or 6.

2) The sum of floors on which E and F live is 9.

• Case 1: E is on Floor 2. Then F must be on Floor 7 (2 + 7 = 9), which is not possible. So, Case 1 is eliminated.

• Case 2: E is on Floor 6. Then F must be on Floor 3 (6 + 3 = 9). This is a valid pair.

Therefore, E lives on Floor 6 and F lives on Floor 3.

6	**E**
5	
4	
3	F
2	
1	

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

The only possible pair of floors whose sum is 3 is Floor 1 and Floor 2. So, B and A live on floors 1 and 2 in any order.

4) Only 3 people live between C and A.

• Subcase 3.1: A is on Floor 1. If 3 people live between C and A, then C must be on Floor 5. This is a valid position.

• Subcase 3.2: A is on Floor 2. If 3 people live between C and A, then C must be on Floor 6. But E is already on Floor 6. So, this subcase is not possible.

Therefore, A lives on Floor 1, and C lives on Floor 5.

6	**E**
5	C
4	
3	F
2	

1	A

5) From the previous points, B and A live on floors 1 and 2. Since A is on Floor 1, B must be on Floor 2.

6	**E**
5	C
4	
3	F
2	B
1	A

6) The only remaining person is D, and the only remaining floor is 4. So, D lives on Floor 4.

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

Therefore, Four people live above B.

Hence, the correct answer is "Option 2".

Q7. Answer: (c) (27, 33, 36)

The logic followed here is:

Logic: First number + 6 = second number + 3 = third number.

Let's verify this logic with the given sets:

For, (22, 28, 31)

22 + 6 = 28 + 3 = 31.

For, (39, 45, 48)

39 + 6 = 45 + 3 = 48.

Now, let's check the options based on this logic:

Option 1) (53, 59, 65)

53 + 6 = 59 + 3 = 62. (Given Third number is 65, 65 ≠ 62)

Here, logic not followed.

Option 2) (44, 47, 50)

44 + 6 = 50 ≠ 47 + 3 = 50)

Here, logic not followed.

Option 3) (27, 33, 36)

27 + 6 = 33 + 3 = 36. (Matches)

Here, logic followed.

Option 4) (17, 20, 26)

17 + 6 = 23. (Given Second number is 20, 20 ≠ 23)

Here, logic not followed.

Hence, the correct answer is "Option 3".

Q8. Answer: (d) 46

The logic followed here is:

Thus, the missing term in the series is 46.

Hence, the correct answer is "Option 4";

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Q9. Answer: (b) Weaving cotton fabric

The correct answer is Weaving cotton fabric.

Key Points

• The secondary sector in India primarily involves manufacturing and industrial activities.

• Weaving cotton fabric is considered part of the secondary sector as it involves processing raw materials (cotton) into finished products (fabric).

• This sector includes activities such as textile production, construction, and factory-based manufacturing.

• Other examples of secondary sector activities include steel production, automobile manufacturing, and food processing.

• The secondary sector contributes significantly to India's economy by adding value to raw materials through industrial processes.

Additional Information

• Primary Sector: Involves activities directly related to natural resources, such as farming, fishing, and mining.

• Secondary Sector: Focuses on manufacturing and processing industries, converting raw materials into finished goods, such as textiles, chemicals, and machinery.

• Tertiary Sector: Encompasses services such as retail, education, healthcare, transportation, and entertainment.

• Importance of Secondary Sector: It plays a vital role in economic development by creating jobs, boosting exports, and increasing industrial output.

• Industrialization in India: Key industries include textiles, steel, cement, and automobile manufacturing, contributing significantly to GDP and infrastructure development.

Q10. Answer: (b) 6

Given series:

(Left) © © 4 3 5 6 7 # * 1 3 % 9 2 7 5 9 & £ @ 7 * (Right)

Condition to be checked:

Number → Number → Number

(Left) © © 4 3 5 6 7 # * 1 3 % 9 2 7 5 9 & £ @ 7 * (Right)

There are six such numbers in the above arrangement (4 3 5, 3 5 6, 5 6 7, 9 2 7, 2 7 5, 7 5 9).

Hence, the correct answer is "Option 2".

Q11. Answer: (c) Great Nicobar Island

The correct answer is Great Nicobar Island.

Key Points

• Indira Point is the southernmost tip of India, located on Great Nicobar Island in the Andaman and Nicobar Islands.

• It is situated at 6°45'10" N latitude and 93°49'36" E longitude, making it the southernmost geographical point of India.

• Indira Point was formerly known as Pygmalion Point before being renamed in honor of former Prime Minister Indira Gandhi.

• The location was significantly affected by the 2004 Indian Ocean tsunami, which caused submersion of parts of the area.

• Great Nicobar Island is the largest island in the Nicobar group and is home to the Great Nicobar Biosphere Reserve, known for its rich biodiversity.

Additional Information

• Nicobar Islands:

• The Nicobar Islands are part of the Union Territory of Andaman and Nicobar Islands, located in the Indian Ocean.

• They consist of 22 islands divided into three groups: North Nicobar, Central Nicobar, and South Nicobar.

• The indigenous communities residing here include the Nicotanese and Shompen tribes.

• 2004 Indian Ocean Tsunami:

• The tsunami was triggered by a massive earthquake off the coast of Sumatra, Indonesia, measuring 9.1-9.3 on the Richter scale.

• It caused widespread destruction across coastal regions, including Indira Point, where the land submerged partially.

• Great Nicobar Island was one of the worst-hit areas, leading to loss of lives and infrastructure.

• Great Nicobar Biosphere Reserve:

• It is a UNESCO-designated biosphere reserve, known for its unique flora and fauna.

• Species like saltwater crocodiles, Nicobar megapodes, and leatherback turtles are found here.

• Efforts are being undertaken to conserve the biodiversity of this region.

• Strategic Importance:

• Great Nicobar Island has strategic importance due to its proximity to the Strait of Malacca, a key maritime trade route.

• India is developing infrastructure projects like the Nicobar Transshipment Port to enhance its presence in the region.

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Q12. Answer: (d) 3

Given series:

(Left) @ 9 7 8 2 @ @ 9 3 * 2 6 2 © # 9 & 7 8 9 @ 4 (Right)

Condition to be checked:

Number → Symbol → Number

@ 9 7 8 2 @ @ 9 3 * 2 6 2 © # 9 & 7 8 9 @ 4

There are three such symbols in the above arrangement (3 * 2, 9 & 7, 9 @ 4).

Hence, the correct answer is "Option 4".

Q13. Answer: (a) Mysore

The correct answer is Mysore.

Key Points

• The princely state of Mysore was one of the progressive states in British India and introduced a representative assembly as early as 1881.

• The assembly was established under the reign of Maharaja Chamarajendra Wadiyar X to provide limited representation to the people.

• This was an important step towards constitutional governance and public involvement in administration in princely states.

• The Mysore Representative Assembly was one of the earliest examples of democratic institutions within a princely state during British rule.

• The assembly primarily acted as an advisory body and discussed matters related to the administration of the state.

Additional Information

• Princely States in British India:

• India had over 500 princely states during British rule, which were governed by local rulers but under British suzerainty.

• The princely states had varying levels of autonomy in administration and governance.

• Mysore was among the most advanced princely states in terms of governance and infrastructure development.

• Mysore's Progressive Policies:

• Mysore is known for its early emphasis on education, industrialization, and public welfare.

• The establishment of representative institutions reflected the state's commitment to modernization.

• Role of Representative Assemblies:

• Representative assemblies in princely states acted as consultative bodies, advising rulers on matters of public interest.

• They were early experiments in democratic governance, paving the way for modern legislative structures.

• Chamarajendra Wadiyar X:

• He was the ruler of Mysore from 1868 to 1894 and played a key role in modernizing the state.

• Under his reign, Mysore saw significant advancements in governance and infrastructure.

Q14. Answer: (a) Print Area

The correct answer is Print Area.

Key Points

• The Print Area feature in MS Excel allows users to define a specific portion of a worksheet that should be printed, instead of printing the entire sheet.

• Once set, the print area ensures that only the selected range of cells is sent to the printer, reducing unnecessary paper usage.

• Users can set or clear the print area by navigating to the Page Layout tab and using the Print Area option.

• This feature is particularly useful for large worksheets where only a specific section of data is relevant for printing.

• Multiple print areas can also be set, and they will print on separate pages.

Additional Information

• Page Orientation: Refers to the layout of the printed page, which can be set to Portrait (vertical) or Landscape (horizontal).

• Margin Settings: Adjusts the white space around the content on the printed page; can be customized through the Page Layout tab.

• Page Break Preview: A view mode in MS Excel that allows users to visualize and adjust where pages will break during printing.

• Print Preview: Provides a preview of how the printed document will look, helping users ensure proper formatting before printing.

• Scaling Options: Allows resizing of the printed content to fit a specific number of pages, ensuring better control over the print layout.

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Q15. Answer: (a) 300

Shortcut Trick

Total profit in value = 5442 − 4800 = 642.

Total profit % = (642 ÷ 4800) × 100 = 13.375%.

Using Allegation: (Profit1: 34%) and (Loss2: −10%) with mean (13.375%).

Ratio of CP = (13.375 − (−10)) : (34 − 13.375) = 23.375 : 20.625 = 187 : 165 = 17 : 15.

Total parts = 17 + 15 = 32. Since 32 parts = 4800, 1 part = 150.

Difference = (17 − 15) × 150 = 2 × 150 = 300.

Therefore The correct answer is Rs. 300.

Alternate Method

Given → Total Cost Price (CP) = 4800, Total Selling Price (SP) = 5442, Profit1 = 34%, Loss2 = 10%.

Formulas: Profit = SP − CP | CP1 + CP2 = Total CP | SP = CP × (100 + P%) ÷ 100.

=> Let CP of first item be x and second item be (4800 − x).

=> SP1 + SP2 = 5442.

=> x × (1.34) + (4800 − x) × (0.90) = 5442.

=> 1.34x + 4320 − 0.90x = 5442.

=> 0.44x = 5442 − 4320 = 1122.

=> x = 1122 ÷ 0.44 = 2550.

=> CP1 = 2550, CP2 = 4800 − 2550 = 2250.

=> Difference = 2550 − 2250 = 300.

Therefore The correct answer is Rs. 300.

Additional Information

Alligation Method

When two components are mixed to form a whole, the ratio of the quantities is the inverse of the difference between the components and the mean.

Profit and Loss on CP

Unless otherwise stated, Profit% and Loss% are always calculated on the Cost Price.

Q16. Answer: (c) 9

The given code language is:

Thus, 'N' is coded as '9'.

Hence, the correct answer is "Option 3".

Q17. Answer: (a) Mother’s sister's husband

Decoding symbols for Family Tree:

Given: A is married to E. E is the sister of R. R is married to D. D is the only brother of Z. B is the only daughter of R.

According to the given information Family Tree Representation:

Thus, A is B's Mother’s sister's husband.

Hence, the correct answer is "Option 1"

Q18. Answer: (c) complex conjugates

Shortcut Trick

The nature of roots is determined by the discriminant (D) = b2 − 4ac.

If D < 0, the square root in the quadratic formula results in an imaginary number (i).

Roots are expressed as x = (−b ± i√|D|) / 2a.

This results in two roots of the form p + iq and p − iq.

These pairs are mathematically defined as complex conjugates.

Therefore The correct answer is complex conjugates.

Alternate Method

Given: The discriminant of a quadratic equation is negative (D < 0).

Formula Used: For a quadratic equation ax2 + bx + c = 0, the roots are x = [−b ± √D] / 2a.

=> Let D = −k, where k is a positive real number (since D is negative).

=> √D = √(−k) = i√k, where i is the imaginary unit (√−1).

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=> Substituting this into the root formula: x = [−b ± i√k] / 2a.

=> The two roots are x1 = (−b/2a) + i(√k/2a) and x2 = (−b/2a) − i(√k/2a).

=> These roots have the same real part and opposite imaginary parts.

=> Such pairs of numbers are called complex conjugates.

Therefore The correct answer is complex conjugates.

Additional Information

Real and Distinct Roots

Occurs when the discriminant D > 0. The roots are two different real numbers.

Real and Equal Roots

Occurs when the discriminant D = 0. Both roots are identical and real (−b/2a).

Rational and Irrational Roots

If D is a perfect square, roots are rational; if D is not a perfect square, roots are irrational and occur in conjugate pairs (p ± √q).

Complex Conjugate Root Theorem

If a polynomial has real coefficients, complex roots must always occur in conjugate pairs.

Q19. Answer: (a) 290

Shortcut Trick

Find the cumulative frequencies: 23, 36, 60, 85, 120.

Total items N = 120, so N/2 = 60.

The cumulative frequency 60 corresponds exactly to the upper limit of the class 240−290.

When N/2 exactly matches a cumulative frequency, the Median is that class boundary.

Therefore The correct answer is 290.

Alternate Method

Given:

Classes: 140−190, 190−240, 240−290, 290−340, 340−390

Frequencies (f): 23, 13, 24, 25, 35

Cumulative Frequencies (cf): 23, 36, 60, 85, 120

Formula Used:

Median = L + [((N/2) − cf_p) ÷ f] × h

Where L = lower limit of median class, N = total frequency, cf_p = cumulative frequency of the preceding class, f = frequency of the median class, h = class width.

Calculations:

=> Total frequency N = 120

=> N/2 = 120 ÷ 2 = 60

=> The cumulative frequency just greater than or equal to 60 is 60 (Class 240−290).

=> L = 240, cf_p = 36, f = 24, h = 50

=> Median = 240 + [(60 − 36) ÷ 24] × 50

=> Median = 240 + [24 ÷ 24] × 50

=> Median = 240 + 1 × 50

=> Median = 240 + 50

=> Median = 290

Therefore The correct answer is 290.

Additional Information

Empirical Relationship

The relationship between central tendencies is given by: Mode = 3 × Median − 2 × Mean.

Class Mark

The Class Mark or Mid-value of a class is calculated as (Lower Limit + Upper Limit) ÷ 2.

Mean for Grouped Data

The arithmetic Mean (μ) is calculated using Σfx ÷ Σf, where x is the class mark and f is the frequency.

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Q20. Answer: (a) 108

Shortcut Trick

The sum of all exterior angles of any regular polygon is always 360°.

Sum of interior angles = 360° + 50% of 360° = 360° + 180° = 540°.

The polygon with a sum of interior angles equal to 540° is a regular pentagon (5 sides).

Each interior angle (x) of a regular pentagon = 540° ÷ 5 = 108°.

Therefore The correct answer is 108°.

Alternate Method

Given:

Sum of interior angles = Sum of exterior angles + 50% of Sum of exterior angles

Each interior angle = x°

Formula Used:

Sum of interior angles of an n-sided polygon = (n − 2) × 180°

Sum of exterior angles of any polygon = 360°

Each interior angle of a regular polygon = [(n − 2) × 180°] ÷ n

Let the number of sides of the regular polygon be n.

The sum of the exterior angles of any polygon is always 360°.

According to the question, the sum of the interior angles is 50% more than the sum of its exterior angles:

=> Sum of interior angles = 360° + 50% of 360°

=> Sum of interior angles = 360° + 180° = 540°

We know that the sum of the interior angles of an n-sided polygon is given by the formula:

=> (n − 2) × 180° = 540°

=> n − 2 = 540° ÷ 180°

=> n − 2 = 3

=> n = 5

Thus, the polygon is a regular pentagon (n = 5).

Each interior angle of a regular polygon is given by:

=> x = [(n − 2) × 180°] ÷ n

=> x = (3 × 180°) ÷ 5

=> x = 540° ÷ 5

=> x = 108°

Why other options are incorrect:

=> Option (2) 96°: If each interior angle is 96°, then the number of sides n = 360° ÷ (180° − 96°) = 360° ÷ 84° = 4.28, which is not an integer.

=> Option (3) 112°: If each interior angle is 112°, then the number of sides n = 360° ÷ (180° − 112°) = 360° ÷ 68° = 5.29, which is not an integer.

=> Option (4) 88°: If each interior angle is 88°, then the number of sides n = 360° ÷ (180° − 88°) = 360° ÷ 92° = 3.91, which is not an integer.

Therefore The correct answer is 108°.

Additional Information

Sum of Interior Angles

The sum of the interior angles of any convex polygon with n sides is always (n − 2) × 180°.

Sum of Exterior Angles

The sum of the exterior angles of any convex polygon is always 360°, regardless of the number of sides.

Interior and Exterior Angle Relationship

At any vertex of a polygon, the interior angle and the exterior angle are supplementary, meaning their sum is always 180°.

Q21. Answer: (a) 1 and 2 only

The correct answer is 1 and 2 only.

Key Points

• India’s robust economic fundamentals: India’s GDP growth rate and macroeconomic stability make it an attractive destination for foreign investments.

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• Ongoing structural reforms: Reforms like GST implementation, labour law rationalization, and measures to ease doing business have enhanced India's investment climate.

• Favorable demographic profile: India has a young and large workforce, which supports long-term economic growth and consumer demand, further inviting investments.

• Global supply chain diversification: Amidst geopolitical tensions, India is seen as a favorable alternative to other countries for manufacturing and investments.

Additional Information

• Structural Reforms: These include direct tax rationalization, banking sector reforms (e.g., Insolvency and Bankruptcy Code), and digitization initiatives like Digital India.

• FDI Liberalization: India has allowed 100% FDI in several sectors such as telecom, single-brand retail, and construction, boosting investor confidence.

• India's Consumer Market: With a rapidly growing middle class, India is one of the world's largest consumer markets, though the statement "decreasing consumer market position" in option 3 is incorrect.

• Ease of Doing Business: India's rank in the World Bank's Ease of Doing Business index has improved significantly due to streamlined processes and policy reforms.

• Geopolitical Factors: Trade wars and shifts in global supply chains have positioned India as a strategic investment hub for multinational corporations.

Q22. Answer: (b) Son

The correct answer is Son.

Key Points

• Ashoka was the son of Bindusara and the grandson of Chandragupta Maurya, the founder of the Mauryan Empire.

• Bindusara, also known as Amitraghata, was the second Mauryan emperor who ruled from 297 BCE to 273 BCE.

• Ashoka succeeded Bindusara as the emperor of the Mauryan Empire in 268 BCE after a succession struggle.

• Ashoka is historically renowned for his transformation after the Kalinga War and his promotion of Buddhism across his empire.

• Bindusara had multiple children, but Ashoka rose to prominence due to his administrative skills and military prowess.

Additional Information

• Bindusara: Known as Amitraghata, meaning "slayer of enemies," Bindusara expanded the Mauryan Empire inherited from his father Chandragupta Maurya.

• Ashoka's Transformation: After the Kalinga War, Ashoka adopted Buddhism and became a proponent of non-violence and dharma (righteousness).

• Chandragupta Maurya: Ashoka's grandfather, who established the Mauryan Empire in 321 BCE with the assistance of Chanakya, a renowned strategist and philosopher.

• Kalinga War: The pivotal war fought in 261 BCE, which led to Ashoka's spiritual awakening and his adoption of Buddhism.

• Rock and Pillar Edicts: Ashoka's inscriptions found across India and neighboring regions, spreading messages of Buddhism, tolerance, and welfare for his subjects.

Q23. Answer: (d) 7.5%

The correct answer is 0.075.

Key Points

• The UNEP Emissions Gap Report 2024 highlights that an annual reduction of 0.075 (7.5%) in global greenhouse gas emissions is necessary until 2035 to limit global warming to 1.5°C.

• The report emphasizes that this rate of reduction aligns with the goals of the Paris Agreement, which aims to keep global temperature rise well below 2°C and pursue efforts to limit it to 1.5°C.

• Current policies and pledges fall significantly short, requiring urgent action to bridge the emissions gap and achieve the 1.5°C target.

• Key sectors contributing to emissions include energy, industry, transportation, and agriculture, all of which need rapid decarbonization.

• Increased investments in renewable energy, energy efficiency, and carbon capture and storage (CCS) technologies are vital to achieve these reductions.

Additional Information

• Emissions Gap: The difference between the current trajectory of greenhouse gas emissions and the levels needed to meet the Paris Agreement targets.

• Paris Agreement: An international treaty adopted in 2015 to combat climate change and strengthen global responses by limiting global warming to well below 2°C, preferably 1.5°C, above pre-industrial levels.

• Greenhouse Gases (GHGs): Gases like carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) that trap heat in the

atmosphere and contribute to global warming.

• Carbon Neutrality: Achieving a balance between emitted carbon dioxide and its removal from the atmosphere, often referred to as "net zero" emissions.

• Renewable Energy: Sources like solar, wind, and hydropower that produce energy without depleting natural resources or causing significant environmental harm.

Q24. Answer: (a) Harmanpreet Kaur

The correct answer is Harmanpreet Kaur.

Key Points

• Harmanpreet Kaur led the Mumbai Indians women's team to victory in the Women's Premier League (WPL) 2025.

• She is a renowned Indian cricketer and the captain of the Indian Women's national team in limited-overs formats.

• Harmanpreet Kaur has played a pivotal role in popularizing women's cricket in India through her exceptional performances.

• Under her leadership, Mumbai Indians showcased remarkable teamwork and skill, securing the WPL 2025 title.

• Her captaincy was marked by strategic decision-making and inspiring leadership, leading the team to success.

Additional Information

• Women's Premier League (WPL):

• The WPL is a professional women's T20 cricket league in India, launched in 2023.

• It aims to promote women's cricket and provide a platform for talented female cricketers to showcase their skills.

• The league consists of franchise teams representing different cities, similar to the Indian Premier League (IPL).

• Harmanpreet Kaur's Achievements:

• She is the first Indian woman to score a century in a Women's T20 International match.

• Harmanpreet was awarded the prestigious Arjuna Award in 2017 for her contributions to Indian cricket.

• She played a historic knock of 171* against Australia in the 2017 Women's World Cup semi-final, earning global acclaim.

• Growth of Women’s Cricket in India:

• The WPL has significantly boosted the visibility and popularity of women's cricket in India.

• Increased investment and sponsorships have improved infrastructure and support for female cricketers.

• India's women cricketers are now recognized globally for their skill and contributions to the sport.

• Importance of Leadership in Sports:

• Effective leadership in sports ensures teamwork, morale, and strategic execution.

• Captains like Harmanpreet Kaur inspire players to perform at their best under pressure.

• Leadership plays a key role in achieving success in competitive tournaments like the WPL.

Q25. Answer: (c) 352

Shortcut Trick

For a circle inscribed in a rectangle, the diameter of the largest circle is equal to the smaller side of the rectangle.

Smaller side (d) = 112 m

Circumference = πd = (22/7) × 112

Circumference = 22 × 16 = 352 m

Therefore The correct answer is 352 m.

Alternate Method

Given:

Length of rectangle (L) = 281 m

Breadth of rectangle (B) = 112 m

Formula Used:

Diameter of the largest inscribed circle in a rectangle = Breadth (B)

Circumference of circle = π × diameter

Calculations:

=> Diameter (d) = 112 m

=> Radius (r) = d ÷ 2 = 112 ÷ 2 = 56 m

=> Circumference = 2 × π × r

=> Circumference = 2 × (22/7) × 56

=> Circumference = 2 × 22 × 8

=> Circumference = 44 × 8 = 352 m

Therefore The correct answer is 352 m.

Additional Information

Area of Inscribed Circle

The area of the largest circle that can be inscribed in a rectangle is $\pi \times (B/2)^2$, where B is the shorter side.

Circle in a Square

For a square of side 'a', the diameter of the inscribed circle is exactly 'a', and the diameter of the circumscribed circle is $a\sqrt{2}$.

Circumference and Radius Relations

If the radius is 7 units, the circumference is 44 units and the area is 154 square units. This ratio is very useful for fast calculations.

Q26. Answer: (c) 6

Shortcut Trick

Total Work (LCM of 3, 9, 27) = 27 units.

Efficiencies: Nick = 9, Kevin = 3, Joe = 1.

Work done in 1st day (all three) = 9 + 3 + 1 = 13 units. Remaining = 14 units.

Since Kevin left 2 days before completion, Joe worked alone for those last 2 days: 2 × 1 = 2 units.

Work left for Kevin and Joe together = 14 − 2 = 12 units. Time taken = 12 ÷ (3 + 1) = 3 days.

Total days = 1 (together) + 3 (Kevin & Joe) + 2 (Joe alone) = 6 days.

Therefore The correct answer is 6 days.

Alternate Method

Person	Days	Total Work	Efficiency
Nick	3	27	9
Kevin	9	3	
Joe	27	1	

Let the total number of days to complete the work be x.

=> Nick worked for 1 day: Work = 9 × 1 = 9 units.

=> Kevin worked for (x − 2) days: Work = 3 × (x − 2) units.

=> Joe worked for x days: Work = 1 × x = x units.

=> Total Work = 9 + 3(x − 2) + x = 27

=> 9 + 3x − 6 + x = 27

=> 4x + 3 = 27

=> 4x = 24

=> x = 6

Therefore The correct answer is 6 days.

Additional Information

Leaving Before Completion Trick

If a person leaves 'n' days before completion, add their (n × efficiency) to the total work and divide by the sum of efficiencies of active workers.

Work and Wages

Wages are always distributed in the ratio of the actual work done by each individual, which is (Efficiency × Time).

Efficiency and Time

Efficiency is inversely proportional to the time taken to complete the work (E prop. to 1/T).

Q27. Answer: (b) 5 km towards the north

Given:

Dhiraj starts from Point Y and drives 22 km towards the east.

He then takes a right turn, drives 33 km, turns left and drives 25 km.

He then takes a left turn and drives 51 km. He takes a left turn, drives 47 km.

He then turns left, drives 23 km and stops at Point Z.

Thus, He should derive 5 km towards the north in order to reach Point Y again,

Hence, the correct answer is "Option 2".

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Q28. Answer: (b) 132

Shortcut Trick

In the equation X/176 = 99/X, X is the mean proportional between 176 and 99.

Shortcut formula: X = √(a × b)

X = √(176 × 99) = √(11 × 16 × 11 × 9)

X = 11 × 4 × 3 = 132

Therefore The correct answer is 132.

Alternate Method

Given:

Equation: (X)/(176) = (99)/(X)

Requirement: Find the positive value of X.

Calculations:

=> X × X = 176 × 99

=> X^2 = 17424

=> X = √17424

=> X = √(16 × 11 × 9 × 11)

=> X = √(16 × 9 × 11^2)

=> X = 4 × 3 × 11

=> X = 132

Therefore The correct answer is 132.

Additional Information

Mean Proportional

If three numbers a, b, and c are in continued proportion such that a/b = b/c, then b is called the mean proportional and b = √(ac).

Cross-Multiplication Rule

For any proportion a/b = c/d, the product of the means equals the product of the extremes: a × d = b × c.

Square Root Extraction

To find the square root of large numbers, factorize them into perfect squares: √(176 × 99) = √(16 × 11 × 9 × 11) = 4 × 3 × 11 = 132.

Q29. Answer: (d) Governor of the State

The correct answer is Governor of the State.

Key Points

• The authority to specify an urban area as a 'large urban area', 'small urban area', or 'transitional area' in a state is vested with the Governor of the State.

• This classification is made under the provisions of the Constitution of India, specifically Article 243Q.

• The Governor acts based on the recommendations of the state government and relevant demographic and administrative factors.

• Such classifications are essential for determining governance structures and resource allocation in urban local bodies.

• The Governor's decision takes into account criteria such as population density, revenue generation, and infrastructure needs of the area.

Additional Information

• Article 243Q:

• This article deals with the constitution of municipalities in urban areas.

• It mandates the classification of areas into transitional, small, and large urban areas for governance.

• Urban Local Bodies:

• These include municipal corporations, municipalities, and Nagar Panchayats.

• The classification helps in determining the appropriate governance model for each type.

• Governor's Role:

• The Governor is the constitutional head of the state and acts on the advice of the Council of Ministers.

• In matters of urban area classifications, the Governor consults with state authorities for proper implementation.

• Demographic Considerations:

• Population density, infrastructure, and revenue generation are key factors in urban area classification.

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• Such classifications impact the development plans and funding allocations for urban areas.

• Urban Governance:

• Effective urban governance ensures better resource management and development planning.

• It also helps in addressing challenges such as urban poverty, sanitation, and housing.

Q30. Answer: (a) The President considers the advice of the Prime Minister and the Union council of ministers.

The correct answer is The President considers the advice of the Prime Minister and the Union council of ministers..

Key Points

• The President of India exercises executive powers based on the advice of the Prime Minister and the Union Council of Ministers as per Article 74 of the Indian Constitution.

• While the President has the right to seek information and clarification, he/she cannot act independently of the advice provided by the Council of Ministers.

• The President may request the Council of Ministers to reconsider their advice but is bound to act according to the reconsidered advice.

• This ensures that the President's role is largely ceremonial and decisions are aligned with parliamentary democracy principles.

Additional Information

• Article 74: Specifies that the President must act according to the advice of the Council of Ministers headed by the Prime Minister.

• Ceremonial Role: The President's role is primarily ceremonial, representing the unity and integrity of the nation.

• Reconsideration Power: The President can return a decision for reconsideration once, but the advice is binding if resubmitted.

• Checks and Balances: The system ensures that the executive authority remains with the elected representatives while maintaining constitutional decorum.

• Parliamentary Democracy: India follows a parliamentary system where executive decisions are made by the elected government, not the President.

Q31. Answer: (a) Rs. 128.03

Shortcut Trick

Rate per half-year = 1.1% ÷ 2 = 0.55%

1st Deposit (Jan 1) earns interest for 2 periods: Interest Factor = $(1.0055)^2 - 1 = 0.01103025$

2nd Deposit (July 1) earns interest for 1 period: Interest Factor = 0.0055

Total Interest = Rs. 7,745 × (0.01103025 + 0.0055) = Rs. 7,745 × 0.01653025

Total Interest ≈ Rs. 128.03

Therefore The correct answer is Rs. 128.03.

Alternate Method

Given:

Annual Interest Rate = 1.1% | Compounding = Half-yearly

Principal (P1) on Jan 1 = Rs. 7,745 | Principal (P2) on July 1 = Rs. 7,745

Formula: Interest = $P[(1 + r/100)^n - 1]$

=> Half-yearly rate (r) = 1.1% ÷ 2 = 0.55%

=> For the 1st deposit (n = 2 half-years):

=> $Interest1 = 7745 \times [(1 + 0.55/100)^2 - 1]$

=> $Interest1 = 7745 \times [(1.0055)^2 - 1] = 7745 \times [1.01103025 - 1]$ = Rs. 85.42928...

=> For the 2nd deposit (n = 1 half-year):

=> $Interest2 = 7745 \times [(1 + 0.55/100)^1 - 1]$

=> $Interest2 = 7745 \times 0.0055$ = Rs. 42.5975

=> Total Interest = Interest1 + Interest2 = 85.42928 + 42.5975 = Rs. 128.02678...

=> Rounded to 2 decimal places = Rs. 128.03

Therefore The correct answer is Rs. 128.03.

Additional Information

Compound Interest Formula

A = P(1 + r/n)^(nt), where A is amount, P is principal, r is annual rate, n is number of compounding periods per year, and t is time in years.

Half-Yearly Compounding

When interest is compounded half-yearly, the annual rate is divided by 2 and the total time (in years) is multiplied by 2.

Effective Annual Rate (EAR)

EAR = $(1 + r/n)^n - 1$. For 1.1% compounded half-yearly, EAR = $(1 + 0.0055)^2 - 1 \approx 1.103\%$.

Q32. Answer: (d) 30

Shortcut Trick

Relative speed (P and Q) = 78 − 62 = 16 kmph = 16 × (5/18) m/s.

Total distance (L_P + 120) = Speed × Time = (16 × 5/18) × (4.5 × 60) = 1200 m.

Length of P = 1200 − 120 = 1080 m.

Crossing R: Speed = 78 + 81 = 159 kmph; Distance = 1080 + 245 = 1325 m.

Time = 1325 ÷ (159 × 5/18) = (1325 × 18) ÷ (159 × 5) = 30 seconds.

Therefore The correct answer is 30 seconds.

Alternate Method

Given: $Speed_P$ = 78 km/hr, $Speed_Q$ = 62 km/hr, $Length_Q$ = 120 m, $Time_{(PQ)}$ = 4.5 min. $Speed_R$ = 81 km/hr, $Length_R$ = 245 m.

Formula: Relative Speed (Same) = S1 − S2 | Relative Speed (Opposite) = S1 + S2 | Distance = Speed × Time

=> Relative speed with Q = 78 − 62 = 16 km/hr = 16 × (5/18) = 40/9 m/s.

=> Time = 4.5 × 60 = 270 seconds.

=> Total Distance = $L_P + L_Q$ = (40/9) × 270 = 1200 m.

=> L_P = 1200 − 120 = 1080 m.

=> Relative speed with R = 78 + 81 = 159 km/hr = 159 × (5/18) m/s.

=> Total Distance to cross R = 1080 + 245 = 1325 m.

=> Required Time = 1325 ÷ (159 × 5 / 18) = (1325 × 18) ÷ 795 = 30 seconds.

Therefore The correct answer is 30 seconds.

Additional Information

Relative Speed Concept

When two objects move in the same direction, subtract their speeds (u − v). When they move in opposite directions, add their speeds (u + v).

Unit Conversion

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

Train Crossing Distance

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

Q33. Answer: (a) NP - RL

The logic followed here is:

Logic: -2 in the place value of the letters,

Option (1) 'NP - RL':

Option (2) 'EF - CD':

Option (3) 'CD - AB':

Option (4) 'IJ - GH':

Hence, the correct answer is "Option 1"

Q34. Answer: (a) 4

Shortcut Trick

Identify the most frequent observation in the given data set.

Observations: 8, 7, 4, 7, 9, 4, 5, 4, 7, 2, 4, 5, 8, 5, 4, 5

Frequency of 4 = 5 times (Highest frequency).

Frequency of 5 = 4 times.

Frequency of 7 = 3 times.

Therefore The correct answer is 4.

Alternate Method

Given: Observations = 8, 7, 4, 7, 9, 4, 5, 4, 7, 2, 4, 5, 8, 5, 4, 5

Formula: Mode is the value that occurs most frequently in a data set.

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Q35. Answer: (c) Justice Ajay Manik Rao Khanwilkar

The correct answer is Justice Ajay Manik Rao Khanwilkar.

Key Points

• Justice Ajay Manik Rao Khanwilkar was appointed as the Chairperson of Lokpal in India as of April 2025.

• Lokpal is an anti-corruption authority established under the Lokpal and Lokayuktas Act, 2013.

• The Chairperson of Lokpal is selected by a committee consisting of the Prime Minister, the Chief Justice of India, the Speaker of the Lok Sabha, and an eminent jurist nominated by the President.

• Justice Khanwilkar has previously served as a judge in the Supreme Court of India and has been known for his contributions to judicial reforms.

• The Lokpal consists of a Chairperson and members, including judicial and non-judicial members, who work to investigate cases of corruption against public servants.

Additional Information

• Lokpal and Lokayuktas Act, 2013: This act provides for the establishment of Lokpal at the central level and Lokayuktas at the state level to address corruption in governance.

• Composition of Lokpal: Lokpal includes a Chairperson and up to eight members, with at least 50% of them being judicial members and 50% belonging to SC/ST/OBC/minorities or women.

• Jurisdiction: Lokpal has jurisdiction over the Prime Minister (with certain safeguards), Ministers, Members of Parliament, and Group A, B, C, and D government officials.

• Investigation Process: The Lokpal can order a preliminary inquiry through its Inquiry Wing or direct a probe through the Central Bureau of Investigation (CBI).

• Significance: Lokpal is a vital institution in ensuring accountability and transparency in governance, strengthening the fight against corruption in India.

Q36. Answer: (c) Periodic oscillatory motion

The correct answer is Periodic oscillatory motion.

Key Points

• Periodic oscillatory motion involves the repetitive back-and-forth movement of an object about a mean position.

• This motion causes particles in the string to vibrate, thereby generating mechanical waves.

• In the case of a string, periodic oscillation produces transverse waves, where the displacement of the string is perpendicular to the direction of wave propagation.

• Such oscillations are triggered when the string is displaced from its equilibrium position and is subjected to a restoring force, such as tension.

• Examples of periodic oscillatory motion include plucking a guitar string, which initiates vibrational waves traveling along the string.

Additional Information

• Wave Types: Waves in a string are typically transverse waves, where the oscillation direction is perpendicular to the wave propagation.

• Restoring Force: The tension in the string acts as the restoring force, bringing the string back to its equilibrium position during oscillations.

• Frequency and Wavelength: The frequency of oscillation determines the pitch of the wave, while the wavelength determines its spatial characteristics.

• Energy Transmission: Waves in a string transfer mechanical energy from one point to another without any physical transfer of the string material.

• Applications: The principles of periodic oscillatory motion are utilized in musical instruments, scientific experiments, and engineering designs such as vibration testing.

Q37. Answer: (b) Abhinav Bharat

The correct answer is Abhinav Bharat.

Key Points

• Abhinav Bharat was a revolutionary secret society founded by Vinayak Damodar Savarkar in 1904.

• The organization aimed to overthrow British rule in India through armed revolution and militant activities.

• It was initially named Mitra Mela before being renamed Abhinav Bharat in 1906.

• Abhinav Bharat served as a platform for young revolutionaries to engage in nationalist activities, including training for armed resistance.

• The society drew inspiration from the Italian revolutionary Giuseppe Mazzini and his organization, Young Italy.

Additional Information

• Vinayak Damodar Savarkar:

• Known as Veer Savarkar, he was a prominent leader of the Indian independence movement.

• He authored the book "The First War of Indian Independence", highlighting the 1857 revolt.

• He advocated the concept of Hindutva and was a key figure in shaping nationalist ideology.

• Imprisoned in the Cellular Jail (Kalapani) in Andaman and Nicobar Islands for his revolutionary activities.

• Mitra Mela:

• Founded by Savarkar in 1899, it was a precursor to Abhinav Bharat.

• Focused on fostering patriotism and organizing youth for revolutionary activities.

• Giuseppe Mazzini:

• An Italian revolutionary whose ideas influenced Savarkar.

• Founder of Young Italy, an organization advocating for Italian unification and independence.

• Revolutionary Activities:

• Abhinav Bharat members were involved in plotting attacks against British officials and institutions.

• It laid the groundwork for future revolutionary groups like the Hindustan Socialist Republican Association.

• Legacy:

• Although disbanded by the 1910s, Abhinav Bharat inspired many freedom fighters in their struggle against British rule.

• Savarkar's vision of armed resistance influenced subsequent revolutionary movements in India.

Q38. Answer: (d) Three

As per the question,

Given Number: 37246895

Rules:

→ Add 1 to each even digit.

→ Subtract 2 from each odd digit.

Applying the rules to each digit:

Original Digit	**3**	**7**	**2**	**4**	**6**	**8**	**9**	**5**
Transformation	-2	-2	+1	+1	+1	+1	-2	-2
New Digit	1	5	3	5	7	9	7	3

New Number: 15357973

Digits that appear more than once: 5, 3, and 7.

Number of digits that appear more than once: Three

Hence, the correct answer is "Option 4".

Q39. Answer: (a) 24.82 crore

The correct answer is 24.82 crore.

Key Points

• According to a report by NITI Aayog, 24.82 crore Indians escaped multidimensional poverty between 2013-14 and 2022-23.

• This was revealed in the National Multidimensional Poverty Index (MPI) Report released in 2023.

• The reduction in multidimensional poverty was driven by improvements in areas such as health, education, and living standards.

• States like Bihar, Uttar Pradesh, Madhya Pradesh, Odisha, and Rajasthan witnessed the largest reductions in poverty levels.

• The MPI measures poverty across three dimensions: health, education, and standard of living, using 12 indicators.

Additional Information

• Multidimensional Poverty Index (MPI):

• It is a globally recognized measure developed by the United Nations Development Programme (UNDP) and the Oxford Poverty and Human Development Initiative (OPHI).

• MPI assesses poverty beyond income, focusing on health, education, and living standards.

• Indicators include nutrition, child mortality, years of schooling, sanitation, drinking water, and housing quality.

• Role of Government Schemes:

• Initiatives such as Ayushman Bharat, PM Awas Yojana, Swachh Bharat Mission, and Skill India contributed significantly to

poverty reduction.

• These schemes focused on improving access to healthcare, education, sanitation, and financial inclusion.

• State-wise Performance:

• States like Kerala and Tamil Nadu consistently rank high in poverty reduction due to better governance and social infrastructure.

• Bihar saw a significant drop in multidimensional poverty, although it still has a higher proportion of poor compared to other states.

• Global Perspective:

• India's success in reducing multidimensional poverty is seen as a major contributor to global poverty alleviation efforts.

• The country's efforts align with the Sustainable Development Goals (SDG 1) of eradicating poverty in all its forms.

Q40. Answer: (a) 219

The logic followed here is:

Thus, the missing term in the series is 219.

Hence, the correct answer is "Option 1";

Q41. Answer: (b) 12

Shortcut Trick

For any regular polygon, the number of sides (n) can be found by dividing the sum of interior angles by 180° and adding 2.

n = (Sum ÷ 180°) + 2

n = (1800° ÷ 180°) + 2

n = 10 + 2 = 12

Therefore The correct answer is 12.

Alternate Method

Given:

Sum of interior angles of a regular polygon = 1800°

Formula Used:

Sum of interior angles = (n − 2) × 180°

Calculations:

=> (n − 2) × 180° = 1800°

=> n − 2 = 1800° ÷ 180°

=> n − 2 = 10

=> n = 10 + 2

=> n = 12

Therefore The correct answer is 12.

Additional Information

Sum of Exterior Angles

For any convex polygon, the sum of all exterior angles is always 360°.

Each Interior Angle

In a regular polygon, each interior angle is given by [(n − 2) × 180°] ÷ n.

Each Exterior Angle

In a regular polygon, each exterior angle is given by 360&

Q42. Answer: (c) 10

Shortcut Trick

The Average is simply the sum of all values divided by the total number of items.

Sum = 8 + 12 + 10 + 14 + 6 = 50

Total Days = 5

Average = 50 ÷ 5 = 10

Therefore The correct answer is 10 mangoes.

Alternate Method

Given: Mangoes sold over five days are 8, 12, 10, 14, and 6.

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

=> Sum of mangoes = 8 + 12 + 10 + 14 + 6

=> Total sum = 50
=> Total number of days = 5
=> Average per day = 50 ÷ 5
=> Average per day = 10
Therefore The correct answer is 10 mangoes.
Additional Information
Arithmetic Mean
It is the most common type of average, calculated by dividing the sum of values by the count of values (n).
Weighted Average
When different items have different importance, the average is $\sum(w_i \times x_i) \div \sum w_i$.
Change in Average
If a constant 'k' is added to every observation in a set, the new average will be the old average + k.

Q43. Answer: (b) 1,200

Shortcut Trick
Income = 100%
Savings = 30% => Expenditure = 70%
Given: 70% = Rs. 840
100% = (840 ÷ 70) × 100 = 12 × 100 = Rs. 1,200
Therefore The correct answer is Rs. 1,200.
Alternate Method
Given:
Savings percentage = 30%
Expenditure value = Rs. 840
Formula Used:
Income = Expenditure + Savings
Calculations:
=> Let the total income be Rs. x.
=> Expenditure percentage = 100% − 30% = 70%
=> 70% of x = 840
=> (70 ÷ 100) × x = 840
=> x = (840 × 100) ÷ 70
=> x = 12 × 100
=> x = 1,200
Therefore The correct answer is Rs. 1,200.
Additional Information
Percentage Change
Percentage change = (Change ÷ Original Value) × 100. Useful for calculating hike or reduction in income.
Base Value Concept
In income-expenditure problems, the Total Income is always considered as the base (100%) for calculations.
Savings Ratio
Income : Expenditure : Savings = 100 : (100−s) : s, where s is the savings percentage.

Q44. Answer: (a) Rs. 184.80

Shortcut Trick
Ratio of quantities of Product A and Product B = 55 : 45 = 11 : 9.
Weighted Average Price = [(Price_A × Ratio_A) + (Price_B × Ratio_B)] ÷ Total Ratio
=> (156 × 11 + 220 × 9) ÷ (11 + 9)
=> (1716 + 1980) ÷ 20 = 3696 ÷ 20 = 184.80.
Therefore The correct answer is Rs. 184.80.
Alternate Method
Given:

Price of Product A (P1) = Rs. 156 | Weight (w1) = 55%

Price of Product B (P2) = Rs. 220 | Weight (w2) = 45%

Formula Used:

Weighted Average = (P1w1 + P2w2) ÷ (w1 + w2)

Calculations:

=> Weighted Average = (156 × 55 + 220 × 45) ÷ 100

=> Weighted Average = (8580 + 9900) ÷ 100

=> Weighted Average = 18480 ÷ 100

=> Weighted Average = Rs. 184.80

Therefore The correct answer is Rs. 184.80.

Additional Information

Weighted Average Concept

Unlike a simple average, the weighted average accounts for the relative importance or frequency of each value in the data set.

Deviation Method for Averages

Assume a base average (e.g., 156) and calculate the net deviation from the other values multiplied by their weights to find the adjustment.

Ratio in Averages

When percentages are given, you can simplify them into their lowest ratio form to make the calculations easier without changing the final result.

Q45. Answer: (b) European Union (EU)

The correct answer is European Union (EU).

Key Points

• The European Union (EU) has partnered with India to jointly address the issue of marine plastic litter and advance waste-to-hydrogen technologies.

• This collaboration is part of a larger initiative to tackle environmental challenges and promote sustainable technologies globally.

• India and the EU are focusing on joint research and innovation in the field of environmental sustainability.

• The partnership aligns with the EU's European Green Deal and India's Swachh Bharat Abhiyan objectives to combat pollution and promote clean energy solutions.

• Collaborative efforts include developing advanced technologies for plastic waste management and harnessing hydrogen as a clean energy resource.

Additional Information

• Marine Plastic Pollution: Refers to the accumulation of plastic waste in oceans, negatively affecting marine life, ecosystems, and human health.

• Waste-to-Hydrogen Technology: Converts waste materials into hydrogen gas, which can be used as a clean and renewable energy source.

• European Green Deal: A set of policy initiatives by the EU aimed at making Europe climate-neutral by 2050.

• Swachh Bharat Abhiyan: A nationwide campaign in India launched by PM Narendra Modi to eliminate open defecation and improve solid waste management.

• India-EU Strategic Partnership: Encompasses collaboration on trade, climate change, innovation, and sustainable development for mutual benefit.

Q46. Answer: (c) 12,600

Shortcut Trick

Ratio of Profit = (Investment × Time).

X: (3 × 12) = 36.

Y: (4 × 6) + (2 × 6) = 24 + 12 = 36.

Z: (10 × 3) + (6 × 9) = 30 + 54 = 84.

Simplified Ratio (X : Y : Z) = 36 : 36 : 84 = 3 : 3 : 7.

Total parts = 13. Given total profit = Rs. 23,400.

Share of Z = (7 ÷ 13) × 23,400 = 7 × 1,800 = Rs. 12,600.

Therefore The correct answer is Rs. 12,600.

Alternate Method

Given → Initial investment ratio X : Y : Z = 3 : 4 : 10. Total duration = 12 months.

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Formulas: Profit Share = Investment × Time Period | Total Profit = Sum of individual shares.

→ Let investments be 3k, 4k, and 10k.

→ X's share = 3k × 12 = 36k.

→ Y's share = (4k × 6) + (2k × 6) = 24k + 12k = 36k.

→ Z's share: Withdraws 40% (i.e., 4k) 9 months prior to completion. So, for the first 3 months investment was 10k, and for the remaining 9 months, it was 6k.

→ Z's share = (10k × 3) + (6k × 9) = 30k + 54k = 84k.

→ Ratio of shares = 36 : 36 : 84 = 3 : 3 : 7.

→ Sum of ratios = 3 + 3 + 7 = 13.

→ Value of 13 units = 23,400 => 1 unit = 1,800.

→ Z's share = 7 units × 1,800 = 12,600.

Therefore The correct answer is Rs. 12,600.

Additional Information

Partnership Ratio

When investments vary over different time periods, the profit is distributed in the ratio of the product of Capital and Time.

Withdrawals and Additions

Any change in capital must be accounted for by splitting the time period into segments where the effective capital remains constant.

Q47. Answer: (c) Promotion of co-operative societies

The correct answer is Promotion of co-operative societies.

Key Points

• Article 43B of the Constitution of India focuses on the promotion of cooperative societies as a Directive Principle of State Policy (DPSP).

• This provision emphasizes that the state shall endeavor to promote the formation and functioning of cooperative societies, ensuring their autonomy.

• Cooperative societies are recognized as instruments for socio-economic development, particularly in rural and agricultural sectors.

• The intent is to empower individuals and communities through collective efforts in areas such as agriculture, marketing, credit, and housing.

• This principle aligns with the broader goal of economic democracy and self-reliance enshrined in the Constitution.

Additional Information

• Directive Principles of State Policy (DPSP): DPSPs are guidelines for the government to frame policies and laws aimed at achieving social and economic justice.

• Cooperative Societies: These are autonomous associations of persons united voluntarily to meet common economic, social, and cultural needs through jointly owned enterprises.

• Role in Rural Development: Cooperative societies play a key role in rural credit, agricultural marketing, and ensuring fair prices for farmers.

• Constitutional Amendment: The 97th Constitutional Amendment Act (2011) explicitly included the promotion of cooperative societies under Article 43B.

• Autonomy and Accountability: The amendment also aimed to provide legal and institutional safeguards to ensure the autonomy and accountability of cooperative societies.

Q48. Answer: (b) Only 2 and 4

The correct answer is Only 2 and 4.

Key Points

• Exercise Tiger Triumph – 25 is a bilateral Tri-Service Humanitarian Assistance and Disaster Relief (HADR) exercise conducted between India and the United States, not the United Kingdom.

• The Harbour Phase of the exercise was scheduled at Visakhapatnam, and the Sea Phase and HADR operations were conducted off Kakinada.

• The exercise aimed at enhancing interoperability between the forces of participating nations and formulating Standard Operating Procedures (SOPs) for a Combined Coordination Centre during joint operations.

• Indian participation included major assets such as the INS Vikrant, along with other contingents from the Army and the Air Force.

• Statement 2 and 4 are correct, while statement 1 is incorrect as the exercise was not with the United Kingdom, and statement 3 is partially correct but not entirely specific to this exercise.

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Additional Information

• Exercise Tiger Triumph: A unique initiative that involves the Indian Armed Forces and the United States Armed Forces working together to improve disaster response capabilities.

• INS Vikrant: India’s first indigenously built aircraft carrier, commissioned in 2022. It plays a pivotal role in strengthening India's maritime capabilities.

• Humanitarian Assistance and Disaster Relief (HADR) Operations: These are operations conducted by military forces to provide relief during disasters like earthquakes, tsunamis, and cyclones, ensuring rapid and effective aid to affected areas.

• Visakhapatnam and Kakinada: Important coastal cities in Andhra Pradesh, India. Visakhapatnam serves as a significant naval base, while Kakinada is known for its strategic port activities.

• Interoperability: The ability of military forces from different nations to operate effectively together, involving the integration of procedures, equipment, and communication systems.

Q49. Answer: (b) 6

Shortcut Trick

Total Work (LCM of 5, 55, 66) = 330 units.

Efficiencies: A = 66, B = 6, C = 5 units/day.

Work done by A in 4 days = 66 × 4 = 264 units.

Remaining work done by B and C together = 330 − 264 = 66 units.

Total time taken = 66 ÷ (6 + 5) = 66 ÷ 11 = 6 days.

Therefore The correct answer is 6 days.

Alternate Method

Given: Time taken by A = 5 days, B = 55 days, C = 66 days. A leaves after 4 days.

Person	Days	Total Work	Efficiency
A	5	330	66
B	55	6	
C	66	5	

=> A worked for 4 days. Work done by A = 66 × 4 = 264 units.

=> B and C worked from the beginning until the work was completed.

=> Work remaining for B and C = 330 − 264 = 66 units.

=> Combined efficiency of B and C = 6 + 5 = 11 units/day.

=> Number of days B and C worked = 66 ÷ 11 = 6 days.

=> Since B and C worked throughout, the whole work was completed in 6 days.

Therefore The correct answer is 6 days.

Additional Information

Work and Efficiency

Efficiency is inversely proportional to the time taken. Total Work = Efficiency × Time.

Leaving Work Concepts

If a person leaves after starting, subtract their work from Total Work. If a person leaves before completion, add their potential work to Total Work.

Pipes and Cisterns

Follows the same logic as Time and Work, where outlet pipes have negative efficiency.

Q50. Answer: (c) Arts

The correct answer is Arts.

Key Points

• Kumudini Rajnikant Lakhia is a renowned Indian classical dancer and choreographer specializing in Kathak dance.

• She has played a pivotal role in modernizing and globalizing Kathak while preserving its traditional essence.

• Her work spans several decades, and she is recognized for revolutionizing Kathak through innovative choreography and group presentations.

• She founded the Kadamb Center for Dance and Music in Ahmedabad to nurture and promote the art of Kathak.

• The Padma Vibhushan, India's second-highest civilian award, was conferred upon her in 2025 for her exceptional contributions to the field of Arts.

Additional Information

• Kathak Dance: Kathak is one of the eight classical dance forms of India, characterized by intricate footwork, spins, and expressive gestures.

• Padma Vibhushan: Instituted in 1954, the Padma Vibhushan is India's second-highest civilian award, given for exceptional service in various fields.

• Kadamb Center for Dance and Music: Founded by Kumudini Lakhia, this institution is a hub for Kathak training, research, and innovation.

• Innovative Choreography: Kumudini Lakhia is celebrated for introducing group choreography to Kathak, a departure from its traditional solo performances.

• Contributions to Arts: Kumudini Lakhia's work has significantly influenced contemporary dance and inspired countless dancers globally.

Q51. Answer: (c) 75%

Shortcut Trick

Interest for 2 years (4 − 2 years) = Rs. 2,000 − Rs. 1,250 = Rs. 750.

Principal (P) = Amount after 2 years − Interest for 2 years = 1250 − 750 = Rs. 500.

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

R = (375 ÷ 500) × 100 = 75%.

Therefore The correct answer is 75%.

Alternate Method

Given:

Amount (A1) = Rs. 1,250 at Time (T1) = 2 years

Amount (A2) = Rs. 2,000 at Time (T2) = 4 years

Formula Used:

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

Amount (A) = Principal (P) + SI

Calculations:

=> SI for 2 years = A2 − A1

=> SI for 2 years = 2000 − 1250 = Rs. 750

=> Since SI is constant, SI for 1 year = 750 ÷ 2 = Rs. 375

=> Principal (P) = A1 − SI for 2 years

=> P = 1250 − 750 = Rs. 500

=> Now, using SI = (P × R × T) ÷ 100 for 1 year:

=> 375 = (500 × R × 1) ÷ 100

=> 375 = 5 × R

=> R = 375 ÷ 5 = 75%

Therefore The correct answer is 75%.

Additional Information

Simple Interest (SI) Property

In Simple Interest, the interest earned remains constant for every equal time interval because it is always calculated on the original Principal.

Rate of Interest Formula

Rate (R) = (SI × 100) ÷ (P × T). For 1 year, R = (Interest ÷ Principal) × 100.

Principal from Amount

Principal (P) = Amount (A) − Total Simple Interest (SI) accumulated over the given period.

Q52. Answer: (a) 0

As per the question,

Given Number: 7235614

Rules:

→ Add 1 to each odd digit.

→ Subtract 2 from each even digit.

Applying the rules to each digit:

Original Digit	7	2	3	5	6	1	4
Transformation	+1	-2	+1	+1	-2	+1	-2
New Digit	8	0	4	6	4	2	2

New Number: 8046422

Identifying the second digit from the left:

The second digit from the left in the new number is '0'.

Final Result: 0

Hence, the correct answer is "Option 1".

Q53. Answer: (a) 13,23,270

Shortcut Trick

Initial population in 1930 = 3,48,000.

Successive increase of 95% for two decades (1930 to 1950).

Multiplying factor for 95% increase = (100 + 95)/100 = 1.95.

Final population = 3,48,000 × 1.95 × 1.95 = 3,48,000 × 3.8025.

Final population = 13,23,270.

Therefore The correct answer is 13,23,270.

Alternate Method

Given:

Population in 1930 (P) = 3,48,000

Growth rate (r) = 95% per decade

Time period (n) = 1950 − 1930 = 2 decades

Formula Used:

Final Population = $P \times (1 + r/100)^n$

Calculations:

=> Final Population = $3,48,000 \times (1 + 95/100)^2$

=> Final Population = $3,48,000 \times (1.95)^2$

=> Final Population = 3,48,000 × 3.8025

=> Final Population = 1,323,270

Therefore The correct answer is 13,23,270.

Additional Information

Successive Percentage Change

If a value changes by x% and then by y% successively, the effective percentage change is given by [x + y + (xy/100)]%.

Population Growth Formula

Population after n years = $P(1 + r/100)^n$, where P is initial population and r is the annual growth rate.

Population Decrease

If the population decreases by r% each year, the population after n years is $P(1 − r/100)^n$.

Q54. Answer: (a) Ahmedabad

The correct answer is Ahmedabad.

Key Points

• The Prime Meridian is the 0° longitude line that passes through Greenwich, London, and is used as the reference point for global longitude measurements.

• Among the cities listed, Ahmedabad is geographically the closest to the Prime Meridian.

• Ahmedabad – ~72.6° E is actually closer to 0° longitude.

• Ahmedabad (72.6° E) is the closest to the Prime Meridian among the given cities.

Additional Information

• Prime Meridian: The Prime Meridian is the starting point for measuring longitude and divides the Earth into the Eastern and Western Hemispheres.

• Longitude: Longitude lines run vertically around the globe and are measured in degrees east or west of the Prime Meridian.

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• Geographical Proximity: When determining proximity to the Prime Meridian, cities with smaller absolute longitudes are closer, regardless of their latitude.

• Indian Cities: Indian cities like Delhi, Ahmedabad, and Kanyakumari are in the Eastern Hemisphere, with longitudes greater than 0°.

• Significance of the Prime Meridian: It serves as the basis for Coordinated Universal Time (UTC) and aids in global navigation and timekeeping systems.

Q55. Answer: (a) = UZV, % = FKG

Given:

: RWS :: INJ : %

Analysis of Options:

Option 1) # = UZV, % = FKG

For # (UZV) to RWS

The pattern derived from UZV to RWS is: (-3, -3, -3).

For INJ to % (FKG)

The pattern derived from INJ to FKG is: (-3, -3, -3).

Option 2) # = NGV, % = FLP

For # (NGV) to RWS

The pattern derived from NGV to RWS is: (+4, +16, -3).

For INJ to % (FLP)

The pattern derived from INJ to FLP is: (-3, -2, +6).

Since the pattern for NGV to RWS (+4, +16, -3) is not the same as the pattern for INJ to FLP (-3, -2, +6), Option 2 is incorrect.

Option 3) # = CDR, % = KJI

For # (CDR) to RWS

The pattern derived from CDR to RWS is: (+15, +19, +1).

For INJ to % (KJI)

The pattern derived from INJ to KJI is: (+2, -3, -1).

Since the pattern for CDR to RWS (+15, +19, +1) is not the same as the pattern for INJ to KJI (+2, -3, -1), Option 3 is incorrect.

Option 4) # = PIV, % = MJU

For # (PIV) to RWS

The pattern derived from PIV to RWS is: (+2, +14, -3).

For INJ to % (MJU)

The pattern derived from INJ to MJU is: (+4, -4, +11).

Since the pattern for PIV to RWS (+2, +14, -3) is not the same as the pattern for INJ to MJU (+4, -4, +11), Option 4 is incorrect.

Thus, the analogy holds true only for Option 1 where the pattern (-3, -3, -3) is consistent for both pairs.

Hence, the correct answer is "Option 1".

Q56. Answer: (d) 7 years

The correct answer is 7 years.

Key Points

• A Chief Judicial Magistrate (CJM) in India is empowered to pass sentences of imprisonment for a term of up to 7 years, as per Section 29(2) of the Code of Criminal Procedure (CrPC), 1973.

• The CJM also has the authority to impose fines and other penalties as prescribed by law, but the maximum term of imprisonment remains capped at 7 years.

• This jurisdiction of sentencing ensures that cases involving higher degrees of punishment are referred to Sessions Courts.

• The CJM typically handles cases classified as warrant cases, which involve offenses punishable with imprisonment exceeding 2 years but not exceeding 7 years.

• This limitation in sentencing authority is part of the tiered structure of the Indian judicial system, designed to distribute case handling based on the severity of offenses.

Additional Information

• Hierarchy of Magistrates:

• In India, Magistrates are categorized as Chief Judicial Magistrates (CJM), Judicial Magistrates of First Class, Judicial Magistrates of Second Class, and Executive Magistrates.

• The CJM is the highest-ranking judicial magistrate at the district level.

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• Code of Criminal Procedure (CrPC):

• The CrPC, 1973, governs the procedural aspects of criminal law in India, including the powers and functions of various courts and magistrates.

• Sessions Court:

• Cases requiring imprisonment exceeding 7 years, life imprisonment, or death penalty are tried at Sessions Courts, which have higher sentencing authority than CJMs.

• Warrant and Summons Cases:

• Warrant cases involve offenses punishable by imprisonment exceeding 2 years, while summons cases are for less severe offenses.

• CJMs primarily handle warrant cases within their sentencing jurisdiction.

Q57. Answer: (a) 9

Shortcut Trick

Find two factors of 36 whose sum is 15.

The factors of 36 are: (1, 36), (2, 18), (3, 12), (4, 9), (6, 6).

Checking the sums: 1+36=37, 2+18=20, 3+12=15, 4+9=13, 6+6=12.

The numbers are 12 and 3.

Difference = 12 − 3 = 9.

Therefore The correct answer is 9.

Alternate Method

Given:

Sum of numbers (x + y) = 15

Product of numbers (xy) = 36

Condition: x > y

Formula Used:

$(x - y)2 = (x + y)2 - 4xy$

Calculations:

$\Rightarrow (x - y)2 = (15)2 - 4 \times (36)$

$\Rightarrow (x - y)2 = 225 - 144$

$\Rightarrow (x - y)2 = 81$

$\Rightarrow x - y = \sqrt{81}$

$\Rightarrow x - y = 9$

Therefore The correct answer is 9.

Additional Information

Algebraic Identity for Sum and Difference

The relation between the square of the sum and the square of the difference is given by: $(x + y)2 - (x - y)2 = 4xy$.

Quadratic Equation Roots

If the sum (S) and product (P) of two numbers are known, the numbers are the roots of the quadratic equation: $t2 - St + P = 0$.

Sum of Squares

The sum of the squares of the numbers can be found using: $x2 + y2 = (x + y)2 - 2xy$. In this case, 225 − 72 = 153.

Q58. Answer: (d) Both conclusions (I) and (II) follow

Statements:

All sparrows are parrots.

All parrots are macau.

Some sparrows are dove.

The least possible venn diagram is given:

Conclusions:

(I) Some sparrows are macau - True(because, all sparrows are parrot and all parrots are macau, it implies some sparrows are macau).

(II) Some doves are parrots - True(because, all sparrows are parrot and some some dove are sparrow it implies that some dove are parrots)

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

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Hence, the correct answer is "Option 4".

Q59. Answer: (d) Section 23 of the Act allows the tribunals to cancel a property transfer if basic amenities are not provided.

The correct answer is Section 23 of the Act allows the tribunals to cancel a property transfer if basic amenities are not provided..

Key Points

• Section 23 of the Maintenance and Welfare of Parents and Senior Citizens Act, 2007 allows tribunals to cancel property transfers when basic amenities or maintenance are not provided by the transferee.

• The Supreme Court in the case of 'Urmila Dixit vs Sunil Sharan Dixit (January 2025)' upheld this provision, enabling senior citizens to seek redress for neglect.

• The ruling clarified that even property transferred through a gift deed can be revoked under Section 23 if the condition of providing maintenance is violated.

• This judgment reinforces the Act's aim to protect the rights and welfare of senior citizens, ensuring they are not left destitute or neglected.

• Tribunals under the Act are empowered to investigate complaints and take appropriate action, including reversing property transfers.

Additional Information

• Maintenance and Welfare of Parents and Senior Citizens Act, 2007: Designed to provide effective provisions for the maintenance and welfare of parents and senior citizens.

• Tribunal Powers: Tribunals established under the Act have the authority to order maintenance payments and cancel property transfers in cases of neglect.

• Key Objectives: The Act aims to ensure financial security, health care, and protection from abuse for senior citizens.

• Gift Deeds: A gift deed is a legal document transferring property as a gift. Section 23 allows revocation if maintenance conditions are violated.

• Legal Precedent: The Supreme Court's ruling in this case further solidifies the legal framework for safeguarding senior citizens' rights under the Act.

Q60. Answer: (c) Dornier

The correct answer is Dornier.

Key Points

• The Dornier aircraft is undergoing a significant midlife upgrade showcased at DRDO's outdoor display in Aero India 2025.

• This upgrade will enhance the operational capabilities of the Dornier, which is widely used by the Indian Armed Forces for surveillance and transport.

• The upgrades include advanced avionics, mission systems, and enhanced communication systems to meet modern operational demands.

• The Dornier aircraft has been a reliable platform for maritime reconnaissance, training, and light transport missions.

• The midlife upgrade will ensure the platform remains effective in the coming decades.

Additional Information

• Dornier Aircraft:

• A twin-turboprop aircraft manufactured by Hindustan Aeronautics Limited (HAL) under license from Dornier GmbH.

• Primarily used for maritime surveillance, transport, and training by the Indian Navy, Coast Guard, and Air Force.

• Midlife Upgrade:

• Refers to the process of modernizing and upgrading an aircraft's systems and capabilities to extend its operational life.

• Typically includes avionics upgrades, mission-specific equipment, and structural enhancements.

• DRDO (Defence Research and Development Organisation):

• India's premier defense R&D organization responsible for developing indigenous defense technologies and systems.

• Regularly showcases its advancements at Aero India, a premier aerospace exhibition held biennially.

• Aero India:

• A biennial air show and aviation exhibition organized by the Ministry of Defence, Government of India.

• It serves as a platform for showcasing the latest aerospace technologies and fostering collaborations in the defense sector.

Q61. Answer: (c) 0

As per the question,

Given Number: 7648135

Rules:

→ Add 1 to each odd digit.

→ Subtract 2 from each even digit.

Applying the rules to each digit:

Original Digit	7	6	4	8	1	3	5
Transformation	+1	-2	-2	-2	+1	+1	+1
New Digit	8	4	2	6	2	4	6

New Number: 8426246

Identifying the digits for difference:

→ Second digit from the left: 4

→ Second digit from the right: 4

Calculating the difference:

4 - 4 = 0

Final Result: 0

Hence, the correct answer is "Option 3".

Q62. Answer: (d) 17

Shortcut Trick

Let the HCF be H.

Numbers are 2H, 7H, and 13H.

Since 2, 7, and 13 are prime numbers, their LCM = 2 × 7 × 13 × H.

182 × H = 3094

H = 3094 ÷ 182 = 17.

Therefore The correct answer is 17.

Alternate Method

Given:

Ratio of numbers = 2 : 7 : 13

LCM of numbers = 3094

Formula Used:

LCM = HCF × (Product of ratios if ratios are co-prime)

Calculations:

=> Let the numbers be 2x, 7x, and 13x, where x is the HCF.

=> LCM(2x, 7x, 13x) = x × LCM(2, 7, 13)

=> Since 2, 7, and 13 are co-prime, their LCM = 2 × 7 × 13 = 182.

=> 182 × x = 3094

=> x = 3094 ÷ 182

=> x = 17

Therefore The correct answer is 17.

Additional Information

LCM and HCF Relationship

For two numbers a and b, a × b = HCF(a, b) × LCM(a, b). This rule only applies to exactly two numbers.

HCF of Ratios

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

Co-prime Numbers

If numbers are co-prime (HCF = 1), their LCM is simply the product of the numbers.

Q63. Answer: (d) Samudragupta

The correct answer is Samudragupta.

Key Points

• Harishena was the court poet of Samudragupta, one of the most illustrious rulers of the Gupta Empire.

• He composed the Allahabad Pillar Inscription, which provides detailed accounts of Samudragupta's conquests and

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achievements.

• The Allahabad Pillar Inscription is written in Sanskrit and consists of poetic verses in the classical kavya style.

• Harishena depicted Samudragupta as a great warrior, statesman, and patron of arts, earning him the title of "Napoleon of India."

• The inscription highlights Samudragupta's military campaigns, administrative prowess, and cultural contributions during his reign.

Additional Information

• Gupta Empire: The Gupta Empire (circa 320–550 CE) is considered a golden age of Indian culture, art, science, and literature.

• Samudragupta: Known for his military campaigns, he expanded the Gupta Empire significantly and established dominance over northern and central India.

• Allahabad Pillar Inscription: This inscription is a primary source for understanding the history and achievements of Samudragupta, written by his court poet Harishena.

• Classical Kavya Style: A refined poetic style in ancient Sanskrit literature, characterized by intricate wordplay, metaphors, and rhythmic structure.

• Patronage of Arts: Samudragupta was a celebrated patron of arts and culture, fostering advancements in music, poetry, and sculpture during his reign.

Q64. Answer: (a) Las Vegas

The correct answer is Las Vegas.

Key Points

• Max Verstappen sealed his fourth consecutive World Drivers' Championship at the 2024 Las Vegas Grand Prix on November 24, 2024.

• A P5 finish in Las Vegas gave him an unassailable 63-point lead over Lando Norris with two races remaining.

• The Las Vegas race was won by George Russell (Lewis Hamilton P2); Verstappen's P5 was enough to clinch the title.

• It was the third time an F1 title was decided in Las Vegas, after 1981 (Piquet) and 1982 (Rosberg).

Additional Information

• Miami is a separate U.S. race (first held in 2022) at the Miami International Autodrome in Miami Gardens—not where the title was clinched.

• Austin hosts the United States Grand Prix at Circuit of The Americas (since 2012), a different venue and event.

• Indianapolis last hosted the U.S. GP in 2007; F1 has not raced there since, ruling it out as the clinching venue.

Q65. Answer: (d) 3

The given code language is:

Thus, 'U' is coded as '3'.

Hence, the correct answer is "Option 4".

Q66. Answer: (c) 3 km to the east

Given:

Mr. Wax starts from Point A and drives 14 km towards the north.

He then takes a right turn, drives 9 km, turns right and drives 7 km.

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

He then takes a right turn and drives 15 km. He takes a final right turn, drives 4 km and stops at Point P.

Thus, he should drive 3 km to the east in order to reach Point A again.

Hence, the correct answer is "Option 3".

Q67. Answer: (a) BZ – KF

The logic followed here is.

Option (1) 'BZ - KF':

Option (2) 'IG - RL':

Option (3) 'RP - AU':

Option (4) 'NL - WQ':

Thus, option 1 is odd one.

Hence, the correct answer is "Option 1".

Q68. Answer: (c) Ellora caves

The correct answer is Ellora caves.

Key Points

• The Kailasa Temple is located in the Ellora Caves, situated in Maharashtra, India.

• It is a massive monolithic rock-cut temple dedicated to Lord Shiva, built during the reign of the Rashtrakuta king Krishna I in the 8th century CE.

• The temple was carved out of a single rock using the vertical excavation method, starting at the top and working downward.

• The Kailasa Temple is renowned for its intricate carvings, massive size, and architectural brilliance, making it one of the largest monolithic structures in the world.

• The Ellora Caves are a UNESCO World Heritage Site, consisting of 34 caves that include Hindu, Buddhist, and Jain monuments.

Additional Information

• Monolithic Architecture: Monolithic structures are carved out of a single piece of material, often stone, showcasing advanced engineering and artistic skills.

• Vertical Excavation Method: This technique involves carving structures from the top down, enabling precision and stability during construction.

• Rashtrakuta Dynasty: The Rashtrakutas were a prominent dynasty in South India, known for their contributions to art, architecture, and literature.

• UNESCO World Heritage Status: The Ellora Caves were designated as a UNESCO World Heritage Site in 1983 for their historical, cultural, and architectural significance.

• Ellora Caves Layout: The caves are divided into three groups: 12 Buddhist caves (1–12), 17 Hindu caves (13–29), and 5 Jain caves (30–34), reflecting India's pluralistic heritage.

Q69. Answer: (b) 1/2

Shortcut Trick

Apply Componendo and Dividendo directly: $(\sec\theta - \tan\theta + \sec\theta + \tan\theta) / (\sec\theta - \tan\theta - \sec\theta - \tan\theta) = (3 + 5) / (3 - 5)$.

$\Rightarrow 2\sec\theta / (-2\tan\theta) = 8 / (-2)$

$\Rightarrow \sec\theta / \tan\theta = 4$

$\Rightarrow (1/\cos\theta) / (\sin\theta/\cos\theta) = 4 \Rightarrow 1 / \sin\theta = 4$

$\Rightarrow \sin\theta = 1/4$

$\Rightarrow 2\sin\theta = 2 \times (1/4) = 1/2$

Therefore The correct answer is 1/2.

Alternate Method

Given: $(\sec\theta - \tan\theta) / (\sec\theta + \tan\theta) = 3 / 5$

Cross Multiplying:

$\Rightarrow 5(\sec\theta - \tan\theta) = 3(\sec\theta + \tan\theta)$

$\Rightarrow 5\sec\theta - 5\tan\theta = 3\sec\theta + 3\tan\theta$

$\Rightarrow 5\sec\theta - 3\sec\theta = 3\tan\theta + 5\tan\theta$

$\Rightarrow 2\sec\theta = 8\tan\theta$

$\Rightarrow \sec\theta / \tan\theta = 8 / 2 = 4$

$\Rightarrow (1 / \cos\theta) \times (\cos\theta / \sin\theta) = 4$

$\Rightarrow 1 / \sin\theta = 4$

$\Rightarrow \sin\theta = 1 / 4$

$\Rightarrow 2\sin\theta = 2 \times (1/4) = 1/2$

Therefore The correct answer is 1/2.

Additional Information

Componendo and Dividendo Rule

If $a/b = c/d$, then $(a + b) / (a - b) = (c + d) / (c - d)$. This is very useful in simplifying trigonometric ratios.

Trigonometric Identities

Key identities: $\sec^2\theta - \tan^2\theta = 1$, hence $(\sec\theta - \tan\theta) = 1 / (\sec\theta + \tan\theta)$.

Reciprocal Relations

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

Q70. Answer: (c) Four

Given: Seven boxes, D, E, F, G, S, T and U, are kept one over the other but not necessarily in the same order.

1) Only two boxes are kept below T.

2) Only one box is kept above U.

3) Only one box is kept between U and D.

4) G is kept immediately above S.

5) F is kept at some place below E.

E
U
F
D
T
G
S

After arranging the boxes, the number of boxes kept between E and G is Four.

Hence, the correct answer is "Option 3".

Q71. Answer: (a) VW −3

The logic followed here is:

For, VH 14 is related to YJ 7

For, PI 18 is related to SK 11

Similarly,

SU 4 is related to ?

Hence, the correct answer is "Option 1".

Q72. Answer: (a) 1,120

Shortcut Trick

Use the CP : MP relationship ratio: CP / MP = (100 − D%) / (100 + P%).

Ratio = (100 − 22) : (100 + 60) => 78 : 160.

Given Cost Price (CP) = 546. Since 78 × 7 = 546.

Therefore, Marked Price (MP) = 160 × 7 = 1,120.

Therefore The correct answer is Rs. 1,120.

Alternate Method

Given: CP = Rs. 546, Profit = 60%, Discount = 22%.

Formulas: SP = CP × (100 + P%) ÷ 100 | MP = SP × 100 ÷ (100 − D%).

=> Calculate Selling Price (SP) = 546 × (160 ÷ 100) = 546 × 1.6 = 873.6.

=> This SP is after a 22% discount on MP, so 78% of MP = 873.6.

=> MP = 873.6 ÷ 0.78 = 1,120.

Therefore The correct answer is Rs. 1,120.

Additional Information

Marked Price and Discount

Discount is always calculated on the Marked Price (MP). SP = MP − Discount.

CP to MP Ratio Formula

When both Profit% and Discount% are given, use MP/CP = (100 + Profit%)/(100 − Discount%) to save time.

Q73. Answer: (b) ZTA

The logic followed here is:

Thus, the missing term in the series is ZTA.

Hence, the correct answer is "Option 2";

Q74. Answer: (c) Topography and population density

The correct answer is Topography and population density.

Key Points

• Kerala’s topography and population density are key factors contributing to its higher road density compared to Rajasthan.

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• Kerala has a dense population of 859 persons per square kilometer (Census 2011), requiring a robust road network for connectivity.

• The state's topography is dominated by undulating terrain and coastal plains, which makes road construction more feasible than in Rajasthan's vast desert regions.

• Rajasthan, with a population density of 200 persons per square kilometer, has vast arid and desert areas, making road construction challenging and less economically viable.

• Kerala's high literacy rate and economic activities also demand better infrastructure, including roads, to support urbanization and trade.

Additional Information

• Road density: It is defined as the total length of roads per unit area or per unit population. Higher road density indicates better connectivity and infrastructure.

• Topography: The physical features of a region, such as plains, mountains, or deserts, significantly influence the feasibility and cost of road construction.

• Population density: Regions with higher population densities, like Kerala, require better connectivity to meet the transportation needs of the people.

• Desert terrain in Rajasthan: The Thar Desert covers a significant portion of Rajasthan, making road construction expensive and less practical in sparsely populated areas.

• Economic factors: Kerala's economic activities, such as tourism, trade, and agriculture, necessitate a dense and well-maintained road network for accessibility and development.

Q75. Answer: (c) Two

Given: A, B, C, D, R, S and T are sitting around a circular table facing the centre of the table.

T sits to the immediate right of D. Only three people sit between T and S when counted from the left of T.

Only three people sit between D and C. A sits to the immediate right of R.

Thus, Only two sit between B and R when counted from the left of R.

Hence, the correct answer is "Option 3".

Q76. Answer: (d) 44.32%

Shortcut Trick

Net discount for 20% and 20% = 20 + 20 − (20 × 20) ÷ 100 = 36%.

Now, net discount for 36% and 13% = 36 + 13 − (36 × 13) ÷ 100.

=> 49 − 468 ÷ 100 = 49 − 4.68 = 44.32%.

Therefore The correct answer is 44.32%.

Alternate Method

Given → Discounts are d1 = 20%, d2 = 13%, and d3 = 20%.

Formulas: Successive discount = a + b − (ab ÷ 100) | SP = MP × (100 − d1)% × (100 − d2)% × ...

=> Let Marked Price (MP) = 100.

=> After 1st discount: 100 − 20% of 100 = 80.

=> After 2nd discount: 80 − 13% of 80 = 80 − 10.4 = 69.6.

=> After 3rd discount: 69.6 − 20% of 69.6 = 69.6 − 13.92 = 55.68.

=> Single discount = MP − Final SP = 100 − 55.68 = 44.32%.

Therefore The correct answer is 44.32%.

Additional Information

Successive Discounts

When two or more discounts are allowed one after the other, they are called successive discounts. The order of applying these discounts does not change the final Selling Price.

Marked Price & Discount

Discount is always calculated on the Marked Price (MP). Formula: Discount = MP − SP.

Q77. Answer: (d) Ansh

Given: Ansh, Kautuk, Swati, Vansh, Navya, Deepak and Rani are sitting around a circular table, facing the centre.

Vansh sits to the immediate left of Ansh. Ansh sits second to the left of Swati.

Kautuk sits second to the right of Swati. Navya sits third to the right of Rani.

Thus, Ansh sits third to the left of Deepak.

Hence, the correct answer is "Option 4".

Q78. Answer: (b) Tourism for Inclusive Growth

The correct answer is Tourism for Inclusive Growth.

Key Points

• National Tourism Day in India is celebrated annually on 25th January to raise awareness about the significance of tourism for the country's economy and culture.

• The theme for National Tourism Day 2025 was Tourism for Inclusive Growth, which emphasizes creating opportunities for all, particularly marginalized communities.

• This theme aligns with the United Nations Sustainable Development Goals (SDGs), focusing on reducing inequalities and fostering social and economic development through tourism.

• Inclusive tourism practices ensure that local communities benefit from the economic and cultural opportunities provided by tourism, promoting equitable growth.

• The celebration of National Tourism Day 2025 included campaigns, workshops, and events aimed at highlighting the importance of sustainable and inclusive tourism practices.

Additional Information

• Tourism in India:

• India is one of the most visited countries globally, known for its cultural heritage, diverse geography, and historical landmarks.

• The tourism sector contributes significantly to India's GDP and employment, accounting for approximately 9.2% of GDP and supporting millions of jobs.

• Inclusive Growth:

• It refers to economic growth that is distributed fairly across society and creates opportunities for all.

• In tourism, this involves supporting local communities, creating equitable job opportunities, and promoting cultural exchange.

• United Nations World Tourism Organization (UNWTO):

• The UNWTO promotes sustainable and inclusive tourism globally.

• It works to ensure that tourism contributes to poverty reduction, environmental protection, and cultural preservation.

• National Tourism Policy 2022 (India):

• This policy aims to position India as a global leader in sustainable tourism by promoting responsible practices.

• It emphasizes eco-tourism, cultural tourism, and adventure tourism while integrating local communities into the tourism value chain.

Q79. Answer: (b) To uniquely identify a network interface controller (NIC) at the data link layer

The correct answer is To uniquely identify a network interface controller (NIC) at the data link layer.

Key Points

• The MAC (Media Access Control) address is a unique identifier assigned to a network interface controller (NIC) for communication at the data link layer.

• It is a 48-bit address typically represented in hexadecimal format (e.g., 00:1A:2B:3C:4D:5E).

• The MAC address is globally unique, ensuring that each device's NIC can be distinctly identified on a network.

• It is essential for facilitating communication between devices within a Local Area Network (LAN).

• MAC addresses are assigned by the manufacturer and are often referred to as the "hardware address" or "physical address."

Additional Information

• Data Link Layer: This is the second layer in the OSI model, responsible for node-to-node data transfer and error detection.

• IP Address vs. MAC Address: While the MAC address identifies the physical device, the IP address is a logical address used for routing across networks.

• Address Resolution Protocol (ARP): ARP is used to map an IP address to a MAC address within a local network.

• Types of MAC Addresses: There are two types: Unicast MAC (for single devices) and Multicast/Broadcast MAC (for multiple devices or all devices on a network).

• Role in Network Security: MAC addresses can be used for access control mechanisms like MAC filtering to restrict devices on a network.

Q80. Answer: (c) 100

Shortcut Trick

Given a : b :: b : c => $b^2 = ac$.

Substitute c = 25a and b = 20.

$(20)^2 = a \times 25a \Rightarrow 400 = 25a^2$.

$a^2 = 16 \Rightarrow a = 4$.

$c = 25 \times 4 = 100$.

Therefore The correct answer is 100.

Alternate Method

Given: $b = 20$, $c = 25a$

Formula Used: In a continued proportion $a : b :: b : c$, $b^2 = ac$

$\Rightarrow b^2 = a \times c$

$\Rightarrow (20)^2 = a \times (25a)$

$\Rightarrow 400 = 25a^2$

$\Rightarrow a^2 = 400 \div 25$

$\Rightarrow a^2 = 16$

$\Rightarrow a = \sqrt{16} = 4$

$\Rightarrow c = 25a = 25 \times 4$

$\Rightarrow c = 100$

Therefore The correct answer is 100.

Additional Information

Mean Proportional

In the proportion $a : b :: b : c$, b is called the mean proportional between a and c, where $b = \sqrt{ac}$.

Third Proportional

In the proportion $a : b :: b : c$, c is called the third proportional to a and b, where $c = b^2/a$.

Fourth Proportional

If four quantities a, b, c, d are in proportion ($a : b :: c : d$), then d is the fourth proportional, where $d = (b \times c) / a$.

Q81. Answer: (a) 768π cm²

Shortcut Trick

For a solid hemisphere, the total surface area is always $3 \times \pi \times r^2$.

Given radius (r) = 16 cm.

$TSA = 3 \times \pi \times (16)^2$

$TSA = 3 \times \pi \times 256 = 768\pi$ cm².

Therefore The correct answer is 768π cm².

Alternate Method

Given:

Radius (r) of the solid hemisphere = 16 cm.

Formula Used:

Total Surface Area (TSA) of a solid hemisphere = Curved Surface Area + Area of base

$TSA = 2\pi r^2 + \pi r^2 = 3\pi r^2$

Calculations:

$\Rightarrow TSA = 3 \times \pi \times (16)^2$

$\Rightarrow TSA = 3 \times \pi \times 256$

$\Rightarrow TSA = 768\pi$ cm²

Therefore The correct answer is 768π cm².

Additional Information

Curved Surface Area of Hemisphere

The CSA of a hemisphere is exactly half of a sphere: $CSA = 2\pi r^2$.

Volume of Hemisphere

The space occupied by a hemisphere is calculated as $Volume = (2/3)\pi r^3$.

Surface Area of a Sphere

For a full sphere, the total surface area is $4\pi r^2$.

Q82. Answer: (c) Rs. 54

Shortcut Trick

Reduce the first condition: 8 Pens + 2 Pencils = Rs. 96 => 4 Pens + 1 Pencil = Rs. 48.

Compare this with the second condition: 4 Pens + 7 Pencils = Rs. 72.

The difference is 6 Pencils = 72 − 48 = Rs. 24 => 1 Pencil = Rs. 4.

Calculate cost of 1 pen: 4 Pens = 48 − 4 = 44 => 1 Pen = Rs. 11.

Cost of 2 pens and 8 pencils = 2 × 11 + 8 × 4 = 22 + 32 = 54.

Therefore The correct answer is Rs. 54.

Alternate Method

Given:

Cost of 8 pens and 2 pencils = Rs. 96

Cost of 4 pens and 7 pencils = Rs. 72

Formula Used:

Simultaneous linear equations: ax + by = c

Calculations:

=> Let the cost of one pen be Rs. x and one pencil be Rs. y.

=> 8x + 2y = 96 — (Eq. 1)

=> 4x + 7y = 72 — (Eq. 2)

=> Divide (Eq. 1) by 2: 4x + y = 48 — (Eq. 3)

=> Subtract (Eq. 3) from (Eq. 2): (4x + 7y) − (4x + y) = 72 − 48

=> 6y = 24 => y = 4

=> Substitute y = 4 in (Eq. 3): 4x + 4 = 48 => 4x = 44 => x = 11

=> Cost of 2 pens and 8 pencils = 2x + 8y = 2(11) + 8(4)

=> Required Cost = 22 + 32 = 54

Therefore The correct answer is Rs. 54.

Additional Information

Linear Equations in Two Variables

Equations of the form ax + by + c = 0 where a and b are not zero are solved using elimination or substitution.

Method of Elimination

Multiplying one or both equations by suitable constants to make the coefficients of one variable equal, then adding or subtracting.

Consistency of Equations

A system has a unique solution if a1/a2 ≠ b1/b2, which is the case for most item-cost problems.

Q83. Answer: (c) 64.1%

The correct answer is 0.641.

Key Points

• As per the Global Gender Gap Report 2024, India has closed 64.1% of its overall gender gap.

• This marks a significant improvement in India's ranking and performance in addressing gender-based inequalities.

• The Global Gender Gap Index is published by the World Economic Forum (WEF) and evaluates gender parity across four key dimensions: Economic Participation, Educational Attainment, Health and Survival, and Political Empowerment.

• India ranks within the top 20% of countries globally in terms of political empowerment, largely due to the high representation of women in political leadership.

• Despite progress, challenges remain in areas such as labour force participation and economic opportunities for women.

Additional Information

• Global Gender Gap Index:

• Introduced by the World Economic Forum (WEF) in 2006 to track progress on gender parity globally.

• Ranks countries based on their performance across four dimensions: Economic Participation, Educational Attainment, Health and Survival, and Political Empowerment.

• The index uses a scale from 0 (imparity) to 1 (parity).

• India's Performance:

• In 2024, India has shown improvement in areas like political empowerment, driven by an increased number of women in leadership roles.

• However, challenges persist in the economic participation of women due to factors like wage gaps and employment opportunities.

• Global Insights:

• Iceland continues to top the Global Gender Gap Index, maintaining its position as the most gender-equal country.

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• On average, the world has closed 69% of the gender gap, with varying progress across regions.
• Key Challenges:
• Barriers such as limited access to education, healthcare, and financial resources for women continue to hinder progress in many nations.
• Efforts to close the gender gap require targeted policy interventions and societal change.

Q84. Answer: (b) Ranthambore National Park

The correct answer is Ranthambore National Park.

Key Points

• Ranthambore National Park is located in the Sawai Madhopur district of Rajasthan, India.
• It is one of the largest and most renowned national parks in Northern India.
• The park is famous for its significant population of Bengal tigers and provides a unique opportunity for tiger sightings in their natural habitat.
• Established in 1980, Ranthambore was declared a National Park under the Wildlife Protection Act.
• It is part of the larger Ranthambore Tiger Reserve, which is managed under India's Project Tiger initiative.

Additional Information

• Project Tiger:
• Launched in 1973, Project Tiger is India's flagship conservation program aimed at preserving Bengal tigers and their habitats.
• The initiative involves habitat restoration, anti-poaching measures, and community participation.
• Ranthambore National Park is one of the key tiger reserves under this project.
• Wildlife Protection Act of 1972:
• The act provides the legal framework for wildlife conservation and the establishment of National Parks and Wildlife Sanctuaries in India.
• Ranthambore National Park was designated under this act to protect its diverse flora and fauna.
• Geography of Ranthambore:
• The park spans an area of approximately 1,334 square kilometers, including the core and buffer zones.
• It features dry deciduous forests, open grasslands, and rocky terrains, making it a unique ecosystem.
• Key Attractions:
• Besides tigers, the park is home to leopards, sambar deer, chital, nilgai, and sloth bears.
• Popular landmarks include the Ranthambore Fort, Padam Talao (lake), and ancient banyan trees.

Q85. Answer: (d) Complementary Metal-Oxide Semiconductor

The correct answer is Complementary Metal-Oxide Semiconductor.

Key Points

• CMOS stands for Complementary Metal-Oxide Semiconductor, a technology used in electronic circuits.
• It is widely used in modern digital integrated circuits, including microprocessors, microcontrollers, and other digital logic circuits.
• CMOS technology is characterized by its low power consumption, making it ideal for battery-operated devices.
• In computer systems, CMOS refers to a small amount of memory on the motherboard that stores BIOS settings, such as system time and hardware configurations.
• The CMOS battery powers this memory, ensuring the stored settings are retained even when the computer is turned off.

Additional Information

• Metal-Oxide-Semiconductor Field-Effect Transistor (MOSFET):
• CMOS technology relies on MOSFETs, which are transistors that use an electric field to control the flow of current.
• These transistors are used in pairs (p-type and n-type) in CMOS circuits to minimize power consumption.
• Applications of CMOS:
• Commonly found in digital cameras, smartphones, and other portable electronic devices.
• Essential for the production of energy-efficient processors and memory chips.
• CMOS vs. TTL:
• TTL (Transistor-Transistor Logic) was a widely-used technology before CMOS.
• CMOS is preferred over TTL for modern applications due to its lower power consumption and higher integration density.
• CMOS Battery:
• The CMOS battery, typically a CR2032 lithium cell, provides power to the CMOS memory chip to store BIOS settings.
• If the CMOS battery dies, the system may lose its time and hardware configuration settings, requiring manual reconfiguration.

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Q86. Answer: (c) Mandapa

The correct answer is Mandapa.

Key Points

• The Mandapa is the pillared hall in front of the sanctum of a Hindu temple where devotees gather for prayers or rituals.

• It serves as a transitional space between the outer world and the sanctum (Garbhagriha) of the temple.

• Mandapas can be used for various religious and cultural activities, including congregations, dances, and discourses.

• Architecturally, the Mandapa is often ornately decorated with carvings and sculptures depicting mythological stories or deities.

• In larger temples, there may be multiple Mandapas, each serving a specific purpose, such as the Ardha-Mandapa (entrance porch) and Maha-Mandapa (great hall).

Additional Information

• Garbhagriha:

• The sanctum sanctorum of a Hindu temple where the main deity resides.

• It is the most sacred and innermost part of the temple.

• Access to the Garbhagriha is often restricted to priests or devotees during specific ceremonies.

• Amalaka:

• A stone disc, often ribbed, placed atop the temple shikhara (tower).

• It symbolizes the sun and is considered an important architectural and spiritual element in temple design.

• Antarala:

• A vestibule or intermediary space between the Garbhagriha and the Mandapa.

• It serves as a transitional area and provides visual as well as spiritual separation between the sanctum and the outer hall.

• Temple Architecture:

• Hindu temples are broadly categorized into Nagara (North Indian), Dravida (South Indian), and Vesara (mixed) styles.

• Each style has unique features, such as the shikhara in Nagara style and the gopuram in Dravida style.

• Role of Mandapa in Rituals:

• The Mandapa is often used for Vedic rituals, yajnas, weddings, and other religious ceremonies.

• It is also a space for devotees to sing bhajans (devotional songs) and meditate.

Q87. Answer: (a) 66

Shortcut Trick

Assume the first distance is 88 km. Then the second distance is 176 km (double). Return distance is 88 + 176 = 264 km.

Total Distance = 88 + 176 + 264 = 528 km.

Total Time = Total Distance ÷ Average Speed = 528 ÷ 33 = 16 hours.

Time for first two parts = (88 ÷ 88) + (176 ÷ 16) = 1 + 11 = 12 hours.

Return speed = Return Distance ÷ Remaining Time = 264 ÷ (16 − 12) = 264 ÷ 4 = 66 km/hr.

Therefore The correct answer is 66 km/hr.

Alternate Method

Given: First speed = 88 km/hr, Second speed = 16 km/hr, Average speed = 33 km/hr.

Formula: Average Speed = Total Distance ÷ Total Time

=> Let distances be d, 2d, and 3d (return).

=> Total Distance = d + 2d + 3d = 6d

=> Total Time = (d/88) + (2d/16) + (3d/v) = (d/88) + (d/8) + (3d/v)

=> Average Speed = 6d ÷ [(d/88) + (11d/88) + (3d/v)] = 33

=> 6 ÷ [(12/88) + (3/v)] = 33

=> 6/33 = (3/22) + (3/v)

=> 2/11 = 3/22 + 3/v

=> 4/22 − 3/22 = 3/v

=> 1/22 = 3/v

=> v = 22 × 3 = 66 km/hr

Therefore The correct answer is 66 km/hr.

Additional Information

Average Speed (Equal Distances)

If two equal distances are covered at speeds a and b, Average Speed = 2ab/(a+b). For three equal distances, Average Speed =

3abc/(ab+bc+ca).

Relative Speed

When two objects move in the same direction, relative speed is |v1 − v2|. In opposite directions, it is (v1 + v2).

Unit Conversion

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

Q88. Answer: (c) Pepsinogen (converted to pepsin)

The correct answer is Pepsinogen (converted to pepsin).

Key Points

• Pepsinogen is secreted by the chief cells of the stomach and is an inactive precursor enzyme (zymogen).

• It is converted into its active form, pepsin, in the presence of hydrochloric acid (HCl) secreted by the parietal cells.

• Pepsin is the primary enzyme responsible for breaking down proteins into smaller peptides in the acidic environment of the stomach.

• The activation of pepsinogen ensures that protein digestion begins in the stomach, which is essential for nutrient absorption in later stages of digestion.

• The stomach's acidic pH (approximately 1.5–3.5) is crucial for the activation and function of pepsin.

Additional Information

• Chief Cells: Specialized cells located in the stomach lining that produce pepsinogen and gastric lipase.

• Hydrochloric Acid (HCl): Secreted by parietal cells in the stomach, HCl lowers the pH and facilitates the activation of pepsinogen into pepsin.

• Protein Digestion: Proteins are broken into smaller peptides by pepsin, and later into amino acids by enzymes in the small intestine like trypsin and chymotrypsin.

• Trypsinogen vs. Pepsinogen: Trypsinogen is secreted by the pancreas and activated into trypsin in the small intestine, while pepsinogen is activated into pepsin in the stomach.

• Zymogen Activation: Zymogens like pepsinogen are inactive forms of enzymes, activated under specific conditions to prevent self-digestion of the tissue that produces them.

Q89. Answer: (a) 10

Given:

Find the value of √0.04/√0.0004

Formula used:

√a/√b = √(a/b)

Calculation:

√0.04/√0.0004

=> √(0.04/0.0004)

=> √100

=> 10

Therefore The correct answer is option (1).

Q90. Answer: (c) 80

Given:

Simplify: [160 ÷ {30 + 7 × (2 - 6)}]

Formula used:

BODMAS Rule (Brackets, Orders, Division/Multiplication, Addition/Subtraction)

Calculation:

Expression: [160 ÷ {30 + 7 × (2 - 6)}]

=> [160 ÷ {30 + 7 × (-4)}]

=> [160 ÷ {30 - 28}]

=> [160 ÷ 2]

=> 80

Therefore The correct answer is option (3).

Q91. Answer: (c) Home → Bullets → Define New Bullet

The correct answer is Home → Bullets → Define New Bullet.

Key Points

• In MS Word, bullet customization is done under the Home tab, which provides access to formatting tools.

• Select Bullets → Define New Bullet to create customized bullet styles.

• Users can choose from various options such as symbols, pictures, or fonts to define a new bullet style.

• Customizing bullets enhances the visual appeal and readability of lists in Word documents.

• This feature allows flexibility in formatting, catering to personal preferences or professional requirements.

Additional Information

• Bullets and Numbering in MS Word

• Bullets are used to create unordered lists, while numbering is used for ordered lists.

• Both features are found under the Home tab in the Paragraph group.

• Users can switch between bullets and numbers, depending on the context of the list.

• Define New Bullet Options

• Symbol: Choose from a wide range of characters to use as a bullet.

• Picture: Import a custom image to use as a bullet.

• Font: Customize bullet appearance by applying specific font styles and sizes.

• Shortcut for Bullets

• Press Ctrl + Shift + L to quickly add default bullets to a list.

• Use the Tab key to indent and Shift + Tab to outdent bullets within the list.

• Importance of Formatting

• Proper formatting with bullets or numbering improves document organization and readability.

• Customized bullets can align with branding or design themes, adding professionalism to presentations and reports.

• It reduces confusion and ensures clarity in conveying information.

Q92. Answer: (c) Orissa

The correct answer is Orissa.

Key Points

• The Green Revolution in India began in the 1960s and primarily focused on increasing agricultural productivity through the adoption of new technologies, such as high-yield variety (HYV) seeds, chemical fertilizers, and irrigation.

• The first phase of the Green Revolution significantly benefited regions with well-established irrigation systems and favorable agricultural conditions, such as Punjab, Haryana, and western Uttar Pradesh.

• Orissa, a state with limited irrigation facilities and a predominantly rain-fed agricultural system, was least impacted during the first phase of the Green Revolution.

• The focus of the Green Revolution on wheat cultivation further marginalized states like Orissa, where rice is the primary crop.

• The lack of infrastructure and technological advancements in Orissa during the initial phase hindered its ability to benefit from the Green Revolution compared to states in northern India.

Additional Information

• Green Revolution: A period of agricultural transformation initiated in the 1960s to increase food production using modern techniques such as HYV seeds, fertilizers, pesticides, and irrigation systems.

• High-Yield Variety Seeds: These seeds were central to the Green Revolution and provided significantly higher yields, especially for crops like wheat and rice.

• Focus on Northern States: The Green Revolution primarily benefited states like Punjab and Haryana due to their advanced irrigation systems and focus on wheat cultivation.

• Limitations in Eastern India: States like Orissa and Bihar faced challenges due to inadequate irrigation infrastructure and reliance on rain-fed agriculture, limiting the impact of the Green Revolution.

• Second Phase of Green Revolution: The later phase focused on extending the benefits to eastern and southern states, aiming to address disparities in agricultural development.

Q93. Answer: (c) 6

As per the question,

Given Numbers: 815 497 460 637 147

Rule: Subtract the second digit of the highest number from the third digit of the lowest number.

→ Highest number: 815

→ Second digit of the highest number: 1

→ Lowest number: 147

→ Third digit of the lowest number: 7

Resultant:

(Third digit of lowest) - (Second digit of highest)

7 - 1 = 6

Hence, the correct answer is "Option 3".

Q94. Answer: (c) Rs. 143 lakh crore

The correct answer is Rs. 143 lakh crore.

Key Points

• According to CRISIL's Infrastructure Yearbook 2023, the projected infrastructure spending in India over the next seven years is estimated at Rs. 143 lakh crore.

• This spending is aligned with the government's focus on achieving its 'Vision 2047', aimed at transforming India into a developed nation by the 100th year of independence.

• The infrastructure investment will focus on key sectors such as transportation, power, urban development, and digital infrastructure.

• Public-private partnerships (PPPs) are expected to play a significant role in executing these projects, emphasizing enhanced efficiency and resource optimization.

• These investments are seen as critical drivers of economic growth, employment creation, and strengthening India's global competitiveness.

Additional Information

• CRISIL:

• CRISIL (Credit Rating Information Services of India Limited) is a leading global analytics company providing ratings, research, and risk advisory services.

• Its Infrastructure Yearbook is a comprehensive annual report that analyzes trends and projections in the infrastructure sector.

• Vision 2047:

• 'Vision 2047' is a long-term strategy by the Government of India to make the country a developed economy by 2047, the centenary of India's independence.

• It focuses on key areas like infrastructure development, energy transition, technological advancement, and social progress.

• Public-Private Partnerships (PPPs):

• PPPs are collaborative agreements between government entities and private companies for funding and managing infrastructure projects.

• They are critical in mobilizing private sector expertise and investment to complement public sector resources.

• Key Infrastructure Sectors:

• Transportation includes highways, railways, airports, and ports.

• Power sector projects focus on renewable energy, transmission, and distribution.

• Urban development involves water supply, sanitation, and affordable housing.

• Digital infrastructure covers broadband connectivity and smart city initiatives.

• Economic Impact:

• Infrastructure investments are expected to contribute significantly to GDP growth, with a multiplier effect on other sectors.

• It will also improve India's ease of doing business and enhance its attractiveness as an investment destination.

Q95. Answer: (b) Delhi

The correct answer is Delhi.

Key Points

• The Delhi Government announced its Electric Vehicle (EV) Policy 2.0 in August 2023 to strengthen its efforts to combat air pollution and promote clean mobility.

• The policy aims to make Delhi a leading state/UT in EV adoption by achieving a target of 80% electrification in new vehicle registrations by 2026.

• Incentives such as subsidies for EV buyers, tax exemptions, and reduced registration fees are part of the policy framework to boost EV adoption.

• Under EV Policy 2.0, Delhi plans to expand charging infrastructure by setting up charging stations and battery swapping facilities across the city.

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• The initiative is aligned with India's broader goals of achieving sustainable and green transportation solutions and reducing dependence on fossil fuels.

Additional Information

• Electric Vehicle (EV) Terminology:

• Battery Electric Vehicles (BEVs): Fully electric vehicles powered by rechargeable battery packs with zero emissions.

• Hybrid Electric Vehicles (HEVs): Vehicles combining a conventional internal combustion engine with an electric propulsion system.

• Plug-in Hybrid Electric Vehicles (PHEVs): Hybrid vehicles with rechargeable batteries that can be charged externally.

• Impact of EV Adoption:

• Reduces greenhouse gas emissions and air pollution, contributing to better public health and environmental sustainability.

• Decreases dependency on fossil fuels, enhancing energy security in the region.

• Charging Infrastructure:

• Delhi’s EV Policy 2.0 emphasizes the deployment of charging stations at strategic locations, including public places and residential complexes.

• Battery swapping stations aim to improve convenience for EV users, facilitating quick changes of depleted batteries.

• Government Role in EV Promotion:

• Subsidies and tax exemptions play a key role in reducing the initial cost of EVs.

• Awareness campaigns and partnerships with private entities are critical to accelerating EV adoption.

Q96. Answer: (a) 2

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

1) Only three boxes are kept below B.

2) Only two boxes are kept between B and A.

3) Only C is kept immediately above E.

4) D is kept at some place below F and at some place above G.

C
E
F
B
D
G
A

After arranging the boxes, the number of boxes kept above F is 2.

Hence, the correct answer is "Option 1".

Q97. Answer: (b) 8

As per the question,

Given Number: 7526318

Rules:

→ Add 2 to each odd digit.

→ Subtract 1 from each even digit.

Applying the rules to each digit:

Original Digit	**7**	**5**	**2**	**6**	**3**	**1**	**8**
Transformation	+2	+2	-1	-1	+2	+2	-1
New Digit	9	7	1	5	5	3	7

New Number: 9715537

Identifying the highest and lowest digits:

→ Highest digit: 9

→ Lowest digit: 1

Calculating the difference:

9 - 1 = 8

Hence, the correct answer is "Option 2".

Q98. Answer: (d) 2

The given code language is:

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

Hence, the correct answer is "Option 4".

Q99. Answer: (c) PO -5

The logic followed here is:

For, HT 17 is related to GQ 6

For, LX 9 is related to KU -2

Similarly,

QR 6 is related to ?

Hence, the correct answer is "Option 3".

Q100. Answer: (a) Salvarsan

The correct answer is Salvarsan.

Key Points

• Salvarsan, also known as Arsphenamine, was discovered by Paul Ehrlich in 1909 as the first effective treatment for syphilis.

• It was marketed as the "magic bullet" for its ability to target disease-causing pathogens without harming the host.

• Salvarsan is an organoarsenic compound, and its discovery marked a significant breakthrough in chemotherapy.

• The drug was revolutionary in reducing mortality and morbidity associated with syphilis, which was a major public health issue at the time.

• Paul Ehrlich's discovery laid the foundation for modern targeted drug therapy, influencing the development of antibiotics and other treatments.

Additional Information

• Syphilis: A sexually transmitted bacterial infection caused by the spirochete Treponema pallidum. It progresses through primary, secondary, latent, and tertiary stages.

• Paul Ehrlich: A German physician and scientist known for his work in immunology, chemotherapy, and the discovery of Salvarsan.

• Ehrlich's concept of creating drugs that specifically target pathogens without damaging host cells, which became a cornerstone of pharmacology.

• Organometallic Compounds: Salvarsan was one of the first organometallic compounds used in medicine, showcasing the potential of synthetic chemistry in drug discovery.

• Antibiotics Development: While Salvarsan was effective, the later discovery of Penicillin in 1928 by Alexander Fleming overshadowed it due to Penicillin's broader spectrum and fewer side effects.

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