RRB NTPC (UG) CBT-I Official Paper (Held On: 07 Aug, 2025 Shift 3) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. The Kopili Hydro Electric Project is located in which Indian state?

(a) Assam
(b) Sikkim
(c) Meghalaya
(d) Arunachal Pradesh

Q2. Which folk dance of Himachal Pradesh was recognised in the Guinness Book of World Records (2015) for having the largest number of participants performing simultaneously at a single venue?

(a) Kiang
(b) Kharait
(c) Kinnauri
(d) Kullu Nati

Q3. Which of the following is the correct descending order of ministerial ranks in the Union Council of Ministers, as per Indian practice?

(a) Cabinet Minister → Deputy Minister → Minister of State
(b) Minister of State → Cabinet Minister → Deputy Minister
(c) Deputy Minister → Minister of State → Cabinet Minister
(d) Cabinet Minister → Minister of State → Deputy Minister

Q4. The Bhabar region lies in which part of the Great Plains?

(a) West of Indus plain
(b) Along the Brahmaputra basin
(c) Just south of the Terai
(d) Adjacent to the foothills of the Himalayas

Q5. Which of the following important Indian festivals was observed on 13th and 14th March 2025?

(a) Eid-ul-Fitr
(b) Diwali
(c) Raksha Bandhan
(d) Holi

Q6. Which issue did the World Economic Forum highlight as the top immediate global threat in its 2025 Global Risks Report published in January 2025?

(a) Escalating cyberattacks
(b) Instability in global markets
(c) State-based armed conflict
(d) Resurgence of pandemics

Q7. Geographically, Bhutan is divided into four regions. Which of the following is NOT a name of those divisions?

(a) Western
(b) Northern
(c) Eastern
(d) Southern

Q8. The Parthians originated from which of the following countries?

(a) Iran
(b) Saudi Arabia
(c) Iraq
(d) Turkey

Q9. Who among the following was honoured as the Internaonal Cricket Council (ICC) Men's Cricketer of the Year for outstanding performance in 2024?

(a) Rohit Sharma
(b) Jasprit Bumrah
(c) Mohammad Sami
(d) Virat Kohli

Q10. Which technology uses acoustic waves to locate objects in the ocean?

(a) Sonar
(b) LiDAR
(c) Echo-sounder
(d) SAR

Q11. India's first exploration licence auction and AI-Driven Mineral Targeting Hackathon was launched in:

(a) Goa
(b) Andhra Pradesh
(c) Telangana
(d) Maharashtra

Q12. What is the name of the patented respiratory device developed by AIIMS Raipur to curb airborne infections in May 2025?

(a) AirGuard
(b) RespiraSafe
(c) HOAC Combo
(d) OxyShield

Q13. In post 1991 reforms, the term 'disinvestment' refers to:

(a) selling government's share in public sector companies
(b) reducing agricultural subsidies
(c) reducing foreign trade
(d) increasing taxes

Q14. Which British law was a major influence on the Indian Constitution's institutional framework?

(a) Government of India Act, 1935
(b) Rowlatt Act, 1919
(c) Indian Councils Act, 1909
(d) Indian Independence Act, 1947

Q15. Which if the following is a landmark judgement of Justice Bela Trivedi, whose official retirement is scheduled for June 2025?

(a) Challenge to the Abrogaon of Arcle 370
(b) Ruling on POCSO Act
(c) Euthanasia and the Right to Die with Dignity

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(d) Validity of Unstamped Arbitraon Agreement

Q16. In the Pallava administration, which was the smallest administrative unit directly managed by local self-governing assemblies?

(a) Nadu
(b) Mandala
(c) Ur
(d) Kottam

Q17. Which of the following is NOT a characteristic of acids?

(a) They turn blue litmus red.
(b) They have a sour taste.
(c) They release OH^− ions in water.
(d) They react with bases to form salt and water.

Q18. Narayana Guru, a social reformer who led a massive movement against the discrimination of the lower castes, was from the state of:

(a) West Bengal
(b) Madhya Pradesh
(c) Kerala
(d) Andhra Pradesh

Q19. Why can Gross Enrollment Ratio (GER) sometimes exceed 100%?

(a) Due to school mergers in rural areas
(b) Due to inclusion of post-graduate students
(c) Due to enrollment of learners outside the official age group
(d) Because of errors in census data

Q20. Which of the following actions will permanently delete a file from an MS Windows system, bypassing the Recycle Bin?

(a) Dragging the file to the Recycle Bin
(b) Right-clicking on the file and selecting 'Delete'
(c) Selecting the file and pressing Shift + Delete keys
(d) Pressing the Delete key

Q21. Which city is constructing a 27-metre-tall clock tower at Talkatora Roundabout to enhance its architectural identity?

(a) Jaipur
(b) New Delhi
(c) Mumbai
(d) Kolkata

Q22. Which key combination is commonly used in Windows OS to open the Task Manager?

(a) Alt + Tab
(b) Alt + F4
(c) Ctrl + Shift + Esc
(d) Ctrl + Tab

Q23. From the 11th through the 18th centuries, what type of literature was the most prominent in medieval India?

(a) Theatrical historical performances
(b) Devotional poetry
(c) Elaborate philosophical discussions
(d) Specialised scientific writings

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Q24. In which of the following years was the Right to Information Act passed?

(a) 1999
(b) 2005
(c) 1973
(d) 2007

Q25. The ‘Kundara Proclamation’ which openly called for taking up arms against the British, is associated with which of the following freedom fighters?

(a) Velu Thampi
(b) Wazir Ali Khan
(c) Gajapatiraju
(d) Kattabomman Nayakan

Q26. In which of the following years did Vodafone start its journey in India?

(a) 2007
(b) 2005
(c) 2009
(d) 2002

Q27. Which state is leading with the highest number of solar power installations under PM Surya Ghar Muft Bijli Yojana (PMSGMBY) by March 2025?

(a) Maharashtra
(b) Uttar Pradesh
(c) Gujarat
(d) Tamil Nadu

Q28. Which company received the 'Champion Company' award at the inaugural CII Awards for Excellence in Disability Inclusion in 2025?

(a) Amazon
(b) Zomato
(c) Wipro Limited
(d) Minda Corporation

Q29. In April 2025, the Cabinet Committee on Economic Affairs has approved the development of a Greenfield High-Speed Corridor connecting which two states on NH06 under Hybrid Annuity Mode (HAM)?

(a) Manipur and Mizoram
(b) Tripura and Mizoram
(c) Meghalaya and Assam
(d) Assam and Nagaland

Q30. To control over district courts and subordinate judiciary lies with which of the following?

(a) President of India
(b) High Court
(c) State Government
(d) Supreme Court of India

Q31. In May 2025, who was appointed as Secretary, Department of Revenue, Ministry of Finance?

(a) Arvind Shrivastava
(b) Shankar Lal Kumawat
(c) Smarak Swain
(d) Ajay Seth

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Q32. On 21 May 2025, the Director General of Health Services (DGHS) in Delhi was appointed to oversee the implementation of which two major healthcare initiatives?

(a) PM-JAY and National Digital Health Mission
(b) Fit India Movement and Swachh Bharat Abhiyan
(c) National Health Stack and eSanjeevani
(d) Ayushman Bharat Health Infrastructure Mission and Ayushman Arogya Mandir

Q33. In which of the following years was the Pradhan Mantri Gram Sadak Yojana (PMGSY) launched by the Government of India to provide connectivity to unconnected habitations as part of a poverty reduction strategy?

(a) 2002
(b) 1997
(c) 2005
(d) 2000

Q34. When was the Basel Convention adopted on the Control of Transboundary Movements of Hazardous Wastes and their Disposal?

(a) 1991
(b) 1989
(c) 1995
(d) 1993

Q35. To pass a Constitutional Amendment Bill in the Lok Sabha, which of the following correctly states the minimum support required?

(a) Two-thirds majority of the total membership of the House
(b) Simple majority of Lok Sabha members and two-thirds of Rajya Sabha members present and voting
(c) Unanimous vote of all Members of Parliament
(d) Majority of the total membership and two-thirds of members present and voting

Q36. Where is the headquarters of the North Western Railway zone located?

(a) Jaipur
(b) Hubli
(c) New Delhi
(d) Hajipur

Q37. Which of the following zones receives vertical rays of the Sun throughout the year?

(a) Frigid
(b) Temperate
(c) Tropical
(d) Polar

Q38. According to the PLFS Annual Report (July 2023–June 2024), which Indian state made history in 2025 by becoming the first to achieve full literacy?

(a) Sikkim
(b) Mizoram
(c) Himachal Pradesh
(d) Kerala

Q39. Which of the following was the first state to be formed on linguistic basis after severe agitation and the death of a protester?

(a) Telangana
(b) Kerala
(c) Andhra Pradesh
(d) Tamil Nadu

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Q40. In which of the following groups does hydrogen belong?

(a) Group 2
(b) Group 17
(c) Group 1
(d) Group 18

MATHEMATICS

Q41. Train A leaves station M at 7:50 a.m. and reaches station N at 2:50 p.m. on the same day. Train B leaves station N at 9:50 a.m. and reaches station M at 2:50 p.m. on the same day. Find the time when Trains A and B meet.

(a) 10:47 p.m.
(b) 11:55 a.m
(c) 9:47 p.m.
(d) 5:00 a.m.

Q42. What smallest number should be added to 4519 so that the sum is completely divisible by 30?

(a) 6
(b) 10
(c) 13
(d) 11

Q43. The product of two positive numbers is 2880. If the first number is five times of the second number, then the sum of the two numbers is:

(a) 137
(b) 150
(c) 164
(d) 144

Q44. The population of a district is 351000, out of which 164000 are males. 14% of the population is literate. If 14% males are literate, then what percentage of females are literate?

(a) 12%
(b) 14%
(c) 16%
(d) 17%

Q45. Two numbers have HCF 6 and LCM 36. If the difference between the two numbers is 30, what are the two numbers?

(a) 12 and 42
(b) 24 and 54
(c) 6 and 36
(d) 18 and 48

Q46. Sapna invested Rs. 20,900 on simple interest, partly at 10% per annum and partly at 9% per annum. If she earns equal interests from the two investments after 5 years, then find the sum invested at 10% per annum (in Rs.).

(a) 9,902
(b) 9,903
(c) 9,900
(d) 9,899

Q47. Simplify the following:

3 [(4over3)x^2 - 30x + 18] - 4(x^2 + 8x - 14)

(a) 122x − 110
(b) −122x + 110
(c) 122x + 110
(d) −122x − 110

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Q48. Which of the following ratios is the greatest?

(a) 40 : 51
(b) 44 : 74
(c) 42 : 70
(d) 22 : 76

Q49. Sakshi bought a toy for Rs. 456, decorated it at a cost of Rs. 20 and sold the toy for Rs. 612. Find the loss or profit percentage.

(a) 210/7% loss
(b) 200/7% profit
(c) 200% profit
(d) 200/7% loss

Q50. If the interest earned during the 2nd year on a certain sum is Rs. 6,786, and the rate of interest is 20% per annum compounded annually, then the sum is:

(a) Rs. 28,275
(b) Rs. 28,035
(c) Rs. 27,795
(d) Rs. 28,905

Q51. Which of the following numbers divides 253118139?

(a) 12
(b) 5
(c) 3
(d) 8

Q52. A sells a MacBook to B at a loss of 60% and B sells the MacBook to C at a profit of 25%. If C purchased the MacBook for Rs. 47,236, then what was the cost (in Rs.) of the MacBook for A?

(a) 94,472
(b) 94,468
(c) 94,478
(d) 94,467

Q53. The average of first 170 even numbers is

(a) 171
(b) 172
(c) 171.5
(d) 170.5

Q54. Rs. 58,300 were divided among A, B and C, such that 4 times of A = 9 times of B = 3 times of C. Find the share of A.

(a) Rs. 20,919
(b) Rs. 21,125
(c) Rs. 20,901
(d) Rs. 20,988

Q55. A shirt is marked at Rs. 900. After a discount of 10%, it is sold. Find the selling price.

(a) Rs. 850
(b) Rs. 820
(c) Rs. 800
(d) Rs. 810

Q56. Find the value of 50^(−13) ÷ 50^(15) × 50^(−11)

(a) 50^(-35)
(b) 50^(-39)
(c) 50^(-49)

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(d) 50^(-36)

Q57. A number, when increased by 70%, gives 3910. The number is:

(a) 6900
(b) 1150
(c) 4600
(d) 2300

Q58. If 2 times the mother's age is 26 years more than 4 times her daughter's age, and 3 times the daughter's age is 2 years less than the mother's age, then what is the difference (in years) between the ages of the mother and the daughter?

(a) 24
(b) 25
(c) 22
(d) 27

Q59. ABCD is a trapezium in which BC || AD and AC = CD. If angle ABC = 18° and angle BAC = 93°, then what is the measure of angle ACD (in degree)?

(a) 37°
(b) 42°
(c) 51°
(d) 50°

Q60. Given that 4^(0.72) = x, 4^(0.86)= y and x^z= y^8, then the value of z is close to:

(a) 9.56
(b) 11.98
(c) 8.43
(d) 9.68

Q61. The average weight (in kg) of a family of five members whose weights are 40 kg, 49 kg, 56 kg, 75 kg and 39 kg is:

(a) 50.8
(b) 51.8
(c) 52.8
(d) 53.8

Q62. The marked price of a stainless-steel bottle is Rs. 1,200. After applying two successive discounts of 10% and 5%, what is the selling price?

(a) Rs. 1,106
(b) Rs. 1,052
(c) Rs. 1,026
(d) Rs. 1,116

Q63. An equilateral triangle has each side measuring 13 cm; find its perimeter.

(a) 30 cm
(b) 39 cm
(c) 26 cm
(d) 42 cm

Q64. Anjali can do a certain piece of work in 30 days. Anjali and Ayushi can together do the same work in 18 days, and Anjali, Ayushi and Ankita can do the same work together in 9 days. In how many days can Anjali and Ankita do the same work together?

(a) 45/4
(b) 35/4
(c) 44/5
(d) 53/6

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Q65. A can lay railway track between two given stations in 19 days and B can do the same job in 16 days. With the help of C, they did the job in 5 days only. Then, C alone can do the job in

(a) 11101/129 days
(b) 13101/129 days
(c) 20101/129 days
(d) 9101/129 days

Q66. A, B and C invest a sum in the ratio of 63 : 35 : 42, respectively. If they earned a total profit of Rs. 5,120 at the end of the year, then what is the difference between share of B and C?

(a) Rs. 274
(b) Rs. 340
(c) Rs. 221
(d) Rs. 256

Q67. The number 245015 is divisible by which of the following?

(a) 2
(b) 15
(c) 5
(d) 11

Q68. Find the circumference (in m) of the largest circle that can be drawn completely inside a rectangle whose dimensions are given as 126 m and 226 m. (Take $\pi = 22/7$)

(a) 395
(b) 396
(c) 401
(d) 389

Q69. A man goes to Lucknow from Kanpur at a speed of 72 km/hr and returns to Kanpur at speed of 90 km/hr, through the same route. What is his average speed (in km/hr) of the entire journey?

(a) 80
(b) 83
(c) 76
(d) 79

Q70. Simplify: $\sec^2\beta - 1/(\text{cosec}^2\beta - 1)$

(a) 0
(b) sec β
(c) 1
(d) cosec β

GENERAL INTELLIGENCE AND REASONING

Q71. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) © & 9 4 5 # 6 2 $ © 8 2 £ @ & # 5 £ % & # 1 (Right)

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

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

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Q72. A, B, C, D, J, K and L are sitting around a circular table, facing the centre of the table. L sits to the immediate right of D. Only three people sit between L and C when counted from the left of L. Only three people sit between D and J. A sits to the immediate right of K.

How many people sit between D and K when counted from the right of K?

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

Q73. 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) GL-HF
(b) KP-LI
(c) MR-NK
(d) IN-JG

Q74. If 3 is added to each odd digit and 1 is subtracted from each even digit in the number 6243514, what will be difference between the highest and lowest digits in the number thus formed?

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

Q75. What should come in place of the question mark (?) in the given series?

84, 85, 87, 91, 99, ?

(a) 511
(b) 115
(c) 125
(d) 254

Q76. If ‘A’ stands for ‘÷’, ‘B’ stands for ‘x’, ‘C’ stands for ‘+’ and ‘D’ stands for ‘−’, then what will come in place of the question mark (?) in the following equation?

(117 A 3) C (119 A 7) C 24 D 6 C (117 A 13) B 2 = ?

(a) 108
(b) 92
(c) 100
(d) 98

Q77. What will come in the place of the question mark (?) in the following equation, if ‘+’ and ‘−’ are interchanged and ‘×’ and ‘÷’ are interchanged?

25 ÷ 6 − 8 + 20 × 4 = ?

(a) 152
(b) 153
(c) 154
(d) 151

Q78. In a certain code language, ‘LEFT’ is coded as ‘5427’ and ‘EARS’ is coded as ‘6153’. What is the code for ‘E’ in the given code language?

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

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Q79. Rajeev starts from Point A and drives 8 km towards east. He then takes a left turn, drives 4 km, turns left and drives 4 km. He then takes a left turn and drives 11 km. He takes a final right turn, drives 4 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 9 km towards south
(b) 7 km towards west
(c) 7 km towards north
(d) 9 km towards north

Q80. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

COB 5, EQD 10, GSF 15, IUH 20, ?

(a) JWI 25
(b) JVI 22
(c) KWJ 25
(d) KVJ 22

Q81. In a certain code language,

'A = B' means 'A is the wife of B',

'A ¥ B' means 'A is the father of B',

'A # B' means ' A is the brother of B' and

'A % B' means 'A is the mother of B'.

How is D related to A if 'D % E = L ¥ T # A'?

(a) Mother's mother
(b) Mother's brother
(c) Mother's father
(d) Mother's sister

Q82. Read the given statement(s) 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 conclusions logically follow(s) from the statement(s).

Statements:

All meters are compasses.

All compasses are scales.

Conclusions:

(I) Some scales are compasses.

(II) All meters are scales.

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

Q83. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

(75, 62, 49)

(61, 48, 35)

(a) (73, 60, 53)
(b) (48, 24, 12)
(c) (92, 79, 66)
(d) (66, 52, 41)

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Q84. ETHC is related to XOMJ in a certain way based on the English alphabetical order. In the same way, CZBE is related to VUGL. To which of the given options is HKQZ related, following the same logic?

(a) AVGF
(b) AFGV
(c) AFVG
(d) AVGH

Q85. Based on the English alphabetical order, three of the following four letter cluster pairs are alike in a certain way and thus form a group. Which one 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) MG-PK
(b) EY-HC
(c) KE-MI
(d) ZT-CX

Q86. CFJP is related to GJMS in a certain way based on the English alphabetical order. In the same way, SVVB is related to WZYE. To which of the given options is EHEK related, following the same logic?

(a) LNHG
(b) LIHN
(c) ILHN
(d) LINJ

Q87. Refer to the following number and symbol series and answer the question that follows. All number are single-digit numbers. Counting to be done from left to right only.

(Left) 5 # % 2 ^ @ 3 & 1 $ 7 Ω 5 2 # 6 * 1 9 (Right)

How many symbols in the series are immediately preceded by a number and immediately followed by a symbol?

(a) More than two
(b) One
(c) Two
(d) None

Q88. 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:

Some kites are hats.

No hat is a bat.

Conclusions:

(I): Some kites are bats.

(II): Some hats are kites

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

Q89. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

KDU 94, HIQ 107, ENM 120, BSI 133, YXE 146, ?

(a) UDB 159
(b) WBZ 161
(c) WDC 161
(d) VCA 159

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Q90. Nushrat ranked 12th from the bottom and 21st from the top in his class. How many students are there in his class?

(a) 32
(b) 30
(c) 31
(d) 33

Q91. Each of the digits in the number 81374569 is arranged in ascending order from left to right. The position of how many digits will remain unchanged as compared to that in the original number?

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

Q92. VR 27 is related to YU 32 in a certain way. In the same way, MI 9 is related to PL 14. To which of the following is GC 13 related, following the same logic?

(a) MP 18
(b) JF 18
(c) JK 16
(d) JF 22

Q93. A, B, C, D, E, F and G are sitting around a circular table facing the centre. Only one person sits between C and D when counted from the right of C. Only one person sits between D and A. Only one person sits between C and B. Only two people sit between F and A. Only one person sits between E and B. How many people sit between E and G when counted from the left of G?

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

Q94. Amit ranked 34th from the top and 45th from the bottom in his class. How many students are there in his class?

(a) 79
(b) 77
(c) 78
(d) 76

Q95. Town B is to the south of Town A. Town C is to the west of Town A. Town D is to the west of Town C. Town E is to the north of Town D and also to the south of Town F. What is the position of Town F with respect to Town D?

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

Q96. What should come in place of the question mark (?) in the given series?

86 88 92 100 116 ?

(a) 148
(b) 180
(c) 132
(d) 144

Q97. 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) NE - RK
(b) PA - TH
(c) XK - BQ

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(d) QI - UO

Q98. What should come in place of the question mark (?) in the given series?

7, 7, 10, 18, 33, ?

(a) 69
(b) 64
(c) 57
(d) 61

Q99. In a row of 47 students facing North, Sonika is 18th from the left end. If Dhruv is 11th to the right of Sonika, what is Dhruv's position from the right-end of the line?

(a) 20th
(b) 18th
(c) 21st
(d) 19th

Q100. In a certain code language, 'YOUR' is coded as '4628' and 'UNIT' is coded as '1385'. What is the code for 'U' in the given code language?

(a) 1
(b) 8
(c) 3
(d) 2

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) Assam

The correct answer is Assam.

Key Points

• Kopili Hydro Electric Project is located in the state of Assam, India.

• It is developed and maintained by the North Eastern Electric Power Corporation (NEEPCO), which is a public sector enterprise under the Ministry of Power, Government of India.

• The project utilizes the waters of the Kopili River, which originates from the Meghalaya hills and flows through Assam.

• It plays a significant role in meeting the power requirements of the northeastern region of India, including Assam, Meghalaya, and other nearby states.

• The hydroelectric project has an installed capacity of approximately 275 MW, making it one of the critical sources of renewable energy in the region.

• The project has faced challenges due to environmental concerns and issues such as water pollution caused by coal mining activities upstream. These issues have impacted the river's water quality, affecting the project's operations.

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• Hence, the correct answer is Assam.

Additional Information

• Location of Kopili Hydro Electric Project:

• The project is situated in the northeastern state of Assam. The river flows through areas of Assam and Meghalaya.

• The Kopili River serves as the primary source for the project, originating in Meghalaya and flowing into Assam.

• NEEPCO and its Role:

• North Eastern Electric Power Corporation (NEEPCO) is responsible for the operation of the Kopili Hydro Electric Project. It is a PSU under the Ministry of Power.

• NEEPCO contributes significantly to the power generation in the northeastern region of India, ensuring electricity supply to states like Assam, Meghalaya, Arunachal Pradesh, etc.

• Environmental Challenges:

• The Kopili River faces pollution issues due to coal mining activities in Meghalaya, which impact the operation of the hydroelectric project.

• Efforts are being made by local governments and environmental bodies to address these concerns and ensure sustainable use of the river resources.

• Importance of Hydroelectric Projects:

• Hydroelectric projects like Kopili contribute to renewable energy generation and help reduce dependency on fossil fuels.

• They are essential for meeting the energy demands of remote and rural areas, particularly in northeastern India.

Important Points

• Hydroelectric Power in India:

• India has significant potential for hydroelectric power generation, with projects spread across states like Himachal Pradesh, Uttarakhand, Arunachal Pradesh, and Assam.

• Hydropower contributes to clean energy and helps the country in its transition towards renewable energy goals.

• Renewable Energy Goals:

• India aims to achieve a target of 500 GW of non-fossil fuel energy capacity by 2030, and hydroelectric projects will play a significant role in achieving this target.

• The International Hydropower Association (IHA) has recognized India's efforts in promoting hydropower as a sustainable energy source.

Q2. Answer: (d) Kullu Nati

The correct answer is Kullu Nati.

Key Points

• The folk dance Kullu Nati is a traditional dance form originating from the Kullu district of Himachal Pradesh.

• Kullu Nati gained global recognition when it was listed in the Guinness Book of World Records in 2015 for having the largest number of participants performing the dance simultaneously at a single venue.

• This traditional dance is performed during various festivals and celebrations, including Dussehra, showcasing the rich cultural heritage of the Kullu region.

• Kullu Nati is characterized by its vibrant costumes, rhythmic steps, and lively music, which represent the traditions and customs of the local people in Himachal Pradesh.

• The dance is performed in groups, where participants form a circle or a line, moving in rhythm to the beats of traditional musical instruments like Nagara, Dhol, and Sarnai.

• The recognition of Kullu Nati in the Guinness Book of World Records not only highlighted the cultural richness of Himachal Pradesh but also brought attention to India’s diverse folk traditions globally.

Additional Information

• Other Folk Dances of Himachal Pradesh:

• Kiang: This is another traditional dance form originating from Himachal Pradesh. It represents the unique culture of the state but is less popular compared to Kullu Nati.

• Kharait: A folk dance performed during local festivities in Himachal Pradesh, showcasing the customs of specific communities.

• Kinnauri: This dance is specific to the Kinnaur region and is performed during special occasions such as weddings or religious ceremonies.

• Significance of Folk Dances:

• Folk dances like Kullu Nati play a crucial role in preserving the cultural heritage and traditions of a region.

• These dances are often performed to express gratitude to deities, celebrate festivals, and strengthen community bonds.

• Guinness World Records Recognition:

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• The inclusion of Kullu Nati in the Guinness Book of World Records in 2015 marked a significant achievement for the dance and brought international recognition to Himachal Pradesh.

• This recognition showcases the importance of preserving and promoting traditional art forms on a global platform.

Important Points

• Key Features of Kullu Nati:

• The dance involves synchronized movements performed by men and women dressed in traditional attire, including vibrant caps, cholis, and churidars.

• It is accompanied by music played on local instruments, creating a lively and festive atmosphere.

• Preservation of Cultural Heritage:

• Efforts to promote and preserve folk dances like Kullu Nati are essential for maintaining India's diverse cultural identity.

• Recognition at global platforms encourages younger generations to engage with and continue these traditions.

Q3. Answer: (d) Cabinet Minister → Minister of State → Deputy Minister

The correct answer is Cabinet Minister → Minister of State → Deputy Minister.

Key Points

• Union Council of Ministers: In the Indian parliamentary system, the Union Council of Ministers consists of three categories of ministers: Cabinet Ministers, Ministers of State, and Deputy Ministers.

• Cabinet Ministers: They hold the highest rank and are responsible for major ministries such as Finance, Home, Defense, and External Affairs. They have decision-making power and participate in Cabinet meetings.

• Ministers of State: They assist Cabinet Ministers and may either handle independent charge of smaller departments or work under Cabinet Ministers for specific portfolios. Their authority is subordinate to Cabinet Ministers.

• Deputy Ministers: They are the lowest-ranked ministers in the hierarchy. Their role is mainly to assist Cabinet Ministers or Ministers of State in administrative work or specific tasks.

• Thus, the correct descending order of ranks is Cabinet Minister → Minister of State → Deputy Minister. Hence, Option 4 is correct.

Additional Information

• Cabinet Ministers:

• They head important ministries and are part of the core decision-making body of the government.

• Examples include Finance Minister, Home Minister, and External Affairs Minister.

• Cabinet Ministers discuss and decide on policies, laws, and issues of national importance. They also represent India at international platforms.

• Ministers of State:

• Ministers of State may work independently (with independent charge) or under Cabinet Ministers.

• They typically manage smaller departments or specific aspects within major ministries. For example, the Minister of State for Finance may handle taxation issues.

• Deputy Ministers:

• Deputy Ministers support Cabinet Ministers or Ministers of State in administrative and policy-related tasks.

• They do not have independent decision-making power but assist in effective governance.

Important Points

• Parliamentary System in India:

• India follows a parliamentary system of governance, where the Prime Minister is the head of the government, and the Council of Ministers is responsible for policy implementation.

• The President appoints ministers on the recommendation of the Prime Minister, and they collectively hold responsibility to the Lok Sabha.

• Role of the Prime Minister:

• The Prime Minister is the leader of the Council of Ministers and decides the portfolios of ministers.

• He/she coordinates between different ministries and ensures the smooth functioning of the government.

• Constitutional Provisions:

• The Union Council of Ministers is mentioned under Article 74 and Article 75 of the Indian Constitution.

• Article 75 specifies that the ministers are collectively responsible to the Lok Sabha.

Q4. Answer: (d) Adjacent to the foothills of the Himalayas

The correct answer is Adjacent to the foothills of the Himalayas.

Key Points

• Bhabar region is located just adjacent to the foothills of the Himalayas. This region is a narrow belt of coarse alluvial deposits, mainly composed of boulders and pebbles.

• It acts as a transitional zone between the Himalayan foothills and the Terai region. The Bhabar region slopes downwards towards the south, forming a natural barrier for water flow.

• The porous soil of Bhabar allows the streams descending from the mountains to disappear underground, making surface water largely absent here. This feature is unique to the Bhabar. Hence, statement 4 is correct.

• Vegetation: The region is sparsely vegetated due to its dry soil conditions. It mostly consists of grasses and shrubs, and agricultural activities are minimal.

• The Bhabar region plays a crucial role in the hydrology of the area, as it absorbs the surface water from the Himalayas, which then re-emerges in the Terai region. This highlights its importance in ecological balance.

• Other options such as West of the Indus Plain, Brahmaputra Basin, and South of Terai are incorrect as they do not geographically align with the Bhabar region.

• Hence, the correct answer is Adjacent to the foothills of the Himalayas.

Additional Information

• Characteristics of the Bhabar Region:

• The Bhabar region is a narrow belt, typically 8-16 km wide, stretching along the Himalayan foothills in northern India.

• Soil composition: It is primarily composed of coarse alluvial deposits, such as boulders, pebbles, and gravel, which have been brought down by rivers originating in the Himalayas.

• Due to its porous soil, the region does not retain surface water, which percolates underground to re-emerge in the Terai region further south.

• Geographical Significance:

• Location: The Bhabar region lies at the base of the Himalayas, forming a natural boundary between the mountainous areas and the plains.

• Hydrology: It acts as a natural filtration zone, absorbing water and ensuring the availability of underground aquifers in the Terai region.

• Vegetation: Sparse vegetation due to dry soil conditions; grasslands dominate the landscape.

• Comparison with Other Regions:

• The Terai region lies south of the Bhabar and is characterized by marshy lands due to the re-emergence of water absorbed by the Bhabar.

• The Indus and Brahmaputra basins are located far from the Bhabar region and have different geographical and ecological characteristics.

Important Points

• Hydrological Importance:

• The Bhabar region ensures underground water recharge for the Terai plains, maintaining ecological balance in the region.

• Geological Formation:

• The region has been formed by centuries of erosion and deposition processes carried out by Himalayan rivers.

• Economic Importance:

• While not agriculturally productive, the region supports ecological stability, making it crucial for sustainable water resource management.

Q5. Answer: (d) Holi

The correct answer is Holi.

Key Points

• Holi, also known as the Festival of Colours, is a prominent Hindu festival celebrated with great fervor across India and in many parts of the world.

• It is observed on the full moon day of the Hindu month of Phalguna, which typically falls in March. In 2025, Holi was celebrated on 13th and 14th March.

• Holi signifies the victory of good over evil, marking the triumph of Lord Vishnu's devotee Prahlada over the demoness Holika. Hence, it is a culturally significant event.

• The festival is celebrated with various traditions such as Holika Dahan (bonfire on the eve of Holi) and the playful throwing of colored powders and water on each other.

• Holi serves as an occasion for people to come together, bury past grievances, and strengthen social bonds. Hence, the correct answer is Holi.

Additional Information

• Celebration of Holi:

• Holi is celebrated in two main phases: Holika Dahan and Rangwali Holi. Holika Dahan involves lighting a bonfire to symbolize the defeat of evil forces, while Rangwali Holi is marked by the playful throwing of colored powders and water.

• People sing, dance, and enjoy festive food such as gujiya, thandai, and other traditional sweets during the celebrations.

• Historical Significance:

• Holi is rooted in Hindu mythology, particularly the story of Prahlada and Holika. Prahlada's unwavering devotion to Lord Vishnu and his survival from the fire set by Holika is celebrated as a victory of faith and goodness.

• Lord Krishna and his playful use of colors with Radha and the gopis is also associated with the festival, adding a romantic and joyous dimension to Holi.

• Regional Variations:

• While Holi is celebrated throughout India, the traditions differ from region to region. For example, in Vrindavan and Barsana, Lathmar Holi involves women playfully hitting men with sticks.

• In Bengal, Holi is celebrated as Dol Jatra, focusing on devotion to Lord Krishna and Radha.

• Global Celebrations:

• Holi has become popular in many countries outside India, including the United States, United Kingdom, and Australia, as a celebration of joy, unity, and diversity.

• Events such as the "Festival of Colors" organized in various parts of the world attract participants from diverse cultures and ethnicities.

Important Points

• Significance of Holika Dahan:

• Holika Dahan is performed on the eve of Holi to signify the burning of evil forces. People gather around the bonfire, chant prayers, and seek blessings for prosperity and health.

• The bonfire is often made with wood and dried leaves, symbolizing the end of the cold season and the arrival of spring.

• Environmental Concerns:

• In recent years, awareness has been raised about the environmental impact of Holi celebrations, such as the excessive use of water and harmful chemical colors.

• Eco-friendly practices, like using natural or organic colors and conserving water, have been promoted to make the festival more sustainable.

Q6. Answer: (c) State-based armed conflict

The correct answer is State-based armed conflict.

Key Points

• State-based armed conflict has been highlighted as the top immediate global threat in the 2025 Global Risks Report published by the World Economic Forum (WEF). This is due to the increasing geopolitical tensions and conflicts between states globally.

• The report emphasizes the rising risks of direct military confrontations between nations, especially in regions such as Eastern Europe, the Middle East, and the Asia-Pacific. These conflicts pose significant threats to global stability. Hence, this is the correct option.

• State-based armed conflicts often have far-reaching consequences, including humanitarian crises, disruption of global trade, and economic instability. Such conflicts can also escalate into proxy wars involving multiple countries. Hence, this is a major global risk.

• The report warns about the compounded risks of state-based conflicts with other issues such as climate change, economic instability, and cyberattacks, which could exacerbate the impact of such conflicts. Therefore, statement is correct.

• The Russia-Ukraine conflict is cited as a prime example of state-based armed conflict and its ripple effects on energy prices, food shortages, and strained geopolitical alliances. Hence, this is a relevant global threat.

Additional Information

• World Economic Forum (WEF) Global Risks Report:

• The Global Risks Report is an annual publication by the World Economic Forum, analyzing risks that could affect global stability. The 2025 report particularly focuses on geopolitical tensions and their implications.

• The report identifies risks in categories such as economic, environmental, geopolitical, societal, and technological threats. State-based armed conflict was ranked as the most immediate threat in 2025.

• Examples of State-Based Armed Conflicts:

• Russia-Ukraine War: Started in February 2022, leading to significant disruptions in global energy markets and food supply chains.

• Middle East Conflicts: Long-standing conflicts such as the Israel-Palestine conflict, the Syrian civil war, and tensions in Iraq continue to destabilize the region.

• Asia-Pacific Tensions: Escalating tensions between China and Taiwan, as well as disputes in the South China Sea, are significant examples of state-based armed conflict.

• Impact of Armed Conflicts:

• Armed conflicts lead to humanitarian crises, including displacement of populations, loss of lives, and destruction of infrastructure.

• They disrupt global trade and supply chains, particularly in sectors such as energy, agriculture, and manufacturing.

• Conflicts also exacerbate political instability and can result in economic recessions and reduced foreign investments in affected regions.

Important Points

• Key Recommendations by WEF:

• The Global Risks Report recommends prioritizing conflict resolution mechanisms, strengthening international alliances, and enhancing global governance frameworks to prevent state-based armed conflicts.

• It emphasizes the need for multilateral cooperation to address underlying causes such as resource disputes, political instability, and territorial claims.

• Broader Implications:

• State-based conflicts can have long-term implications on global economic growth, with reduced investments and diminished international trade.

• They also exacerbate existing global challenges like climate change, food insecurity, and migration crises, requiring integrated solutions.

• The role of international organizations like the United Nations and regional alliances in conflict resolution has been highlighted in the report.

Q7. Answer: (b) Northern

The correct answer is Northern.

Key Points

• Bhutan is divided into four geographical regions: Western, Eastern, Central, and Southern. These regions are administrative and geographical divisions of the country.

• The Western region of Bhutan includes districts such as Thimphu, Paro, and Haa, which are popular for their cultural heritage, administrative importance, and tourist attractions. Hence, Western is a correct division.

• The Eastern region is known for its rugged terrain and includes districts such as Trashigang and Mongar. This region is vital for its cultural and traditional practices. Hence, Eastern is a correct division.

• The Central region includes districts such as Bumthang, which are known for their religious significance and natural beauty. This region is considered the spiritual heart of Bhutan. Hence, Central is a correct division.

• The Southern region is characterized by its subtropical climate and includes districts like Sarpang and Samtse. This region is important for trade and economic activities due to its proximity to India. Hence, Southern is a correct division.

• Northern Bhutan is not recognized as a separate geographical division. While the northern parts of Bhutan are dominated by Himalayan mountain ranges, they are not classified as an independent region. Hence, Northern is not a geographical division of Bhutan.

Additional Information

• Bhutan's Geographical Divisions:

• Bhutan is divided into 20 districts (Dzongkhags), which are grouped into geographical regions for administrative purposes.

• The classification of regions (Western, Eastern, Central, Southern) is based on cultural, historical, and geographical factors.

• Features of Each Region:

• Western Bhutan: Includes the capital city, Thimphu, and is the administrative and cultural hub of Bhutan. It hosts major festivals and government institutions.

• Eastern Bhutan: Known for its traditional practices, the Eastern region is culturally distinct and includes the Trashigang Dzong, one of the largest Dzongs in Bhutan.

• Central Bhutan: Renowned for its monasteries and sacred sites, this region is home to many historical landmarks like Jakar Dzong in Bumthang.

• Southern Bhutan: This region is located near the Indian border and is characterized by dense forests, fertile plains, and bustling trade activities.

• Important Points:

• The concept of geographical divisions in Bhutan is essential for administrative governance and cultural identity.

• The Northern part of Bhutan is mostly uninhabitable due to the Himalayan terrain and high altitude, which makes it unsuitable for division into a separate region.

Q8. Answer: (a) Iran

The correct answer is Iran.

Key Points

• The Parthians originated from Iran: The Parthians were an ancient Iranian people who established the Parthian Empire, which lasted from 247 BCE to 224 CE.

• The Parthian Empire is also known as the Arsacid Empire, named after its founder Arsaces I, who started the dynasty in northeastern Iran.

• Parthians played a crucial role in ancient history by acting as a cultural and political bridge between the Roman Empire and the civilizations of Asia, including the Silk Road trade network.

• They are famous for their unique military tactics, especially their horse-mounted archery skills, which made them formidable opponents in battles against the Romans and other empires.

• The Parthians were known for their contributions to art, architecture, and governance, blending Hellenistic and Iranian traditions. This cultural synthesis is evident in their coinage, monuments, and administrative practices.

Additional Information

• Geographical Location:

• The Parthians originated in the region of northeastern Iran, primarily in the area known as Parthia, which corresponds to modern-day Khorasan Province.

• Their empire expanded westward to encompass regions of Mesopotamia, eastern Anatolia, and portions of the Caucasus.

• Historical Context:

• The Parthians rose to power after overthrowing the Seleucid Empire, which itself was a successor of the empire of Alexander the Great.

• Under the leadership of various rulers, the Parthian Empire became a dominant force in the Middle East, rivaling the Roman Empire.

• Parthian Contributions:

• Art and Architecture: Parthian art blended Greek, Persian, and local styles, evident in their sculptures, pottery, and city designs.

• Military Innovations: The Parthians were renowned for their cavalry, especially the use of heavily armored horsemen called cataphracts and skilled mounted archers who could shoot arrows backward while retreating (the "Parthian shot").

• Economic Importance: Their empire was a key player in the Silk Road trade, facilitating the exchange of goods, ideas, and cultures between East and West.

Important Points

• Key Features of Parthian Empire:

• Governance: The Parthians practiced a decentralized form of governance, allowing local rulers to maintain significant autonomy while remaining loyal to the empire.

• Culture: The blending of Iranian and Hellenistic traditions under Parthian rule set the stage for the development of the later Sassanian Empire.

• Military Strategies: Their military prowess was characterized by the ability to use terrain, mobility, and psychological warfare to defeat their enemies, including the Romans.

• Legacy:

• The Parthians left a lasting impact on the history of Iran, influencing subsequent empires such as the Sassanian Empire.

• Their contributions to trade, culture, and governance continue to be studied as a significant chapter in ancient world history.

Q9. Answer: (b) Jasprit Bumrah

The correct answer is Jasprit Bumrah.

Key Points

• Jasprit Bumrah has been one of the most consistent bowlers in modern cricket, particularly in the limited-overs format. His pace, accuracy, and ability to deliver yorkers at crucial moments have made him a standout performer globally.

• In the year 2024, he achieved significant milestones, including exceptional performances in international tournaments and bilateral series, which contributed to his recognition as the ICC Men's Cricketer of the Year.

• Bumrah's ability to perform across all formats, including Test, ODI, and T20I cricket, has been instrumental in India's success on various platforms. His bowling figures have often been match-winning, earning him accolades and awards worldwide.

• The recognition by the International Cricket Council (ICC) is based on players' performances throughout the year, taking into account their contributions to their team’s success and their individual achievements.

• Jasprit Bumrah has been lauded for his ability to handle pressure situations, especially during death overs, and his excellence in adapting to different pitches and conditions. Hence, he was rightly honored as the ICC Men's Cricketer of the Year for 2024.

Additional Information

• Jasprit Bumrah:

• Age: Born on December 6, 1993, Jasprit Bumrah hails from Ahmedabad, Gujarat, India. He is regarded as one of the most talented fast bowlers of his generation.

• Specialty: Bumrah is known for his unorthodox bowling action and ability to bowl accurate yorkers consistently. He is equally effective in Test matches, ODIs, and T20Is.

• Achievements: Bumrah has contributed significantly to India's wins in various tournaments, including the ICC World Cup, IPL (Indian Premier League), and bilateral series.

• ICC Men's Cricketer of the Year:

• This award is given annually by the International Cricket Council (ICC) to recognize the best male cricketer of the year based on their individual performances and contributions to the team.

• Criteria: The selection is based on players' performances in all formats of cricket during the year, including Test matches, ODIs, T20Is, and international tournaments.

• Previous winners include Virat Kohli, Ben Stokes, and Steve Smith, who have demonstrated exceptional skills and consistency in their respective roles.

Important Points

• Other Nominees in 2024:

• Rohit Sharma: Known for his batting prowess, Rohit Sharma has been a consistent performer, particularly in ODIs and T20Is. However, his performance in 2024 did not surpass Bumrah's achievements.

• Virat Kohli: The former captain of the Indian cricket team has been a dominant force in international cricket, but his 2024 statistics did not match Bumrah’s impact in crucial matches.

• Mohammad Sami: A talented cricketer from India, Sami has showcased exceptional bowling skills. However, he fell short of achieving the consistency and match-winning performances displayed by Bumrah in 2024.

• Key Characteristics of ICC Awards:

• The awards recognize players who demonstrate consistent performances across all formats and their ability to contribute to their team's success.

• It is considered one of the most prestigious honors in the world of cricket and is keenly awaited by players and fans alike.

Q10. Answer: (a) Sonar

The correct answer is Sonar.

Key Points

• Sonar (Sound Navigation and Ranging) is a technology that uses sound waves to detect, locate, and map objects underwater. It operates by emitting sound pulses and measuring the time taken for the echo to return after bouncing off an object.

• Acoustic waves are the core component of sonar technology. These waves travel through water, hit an object, and reflect back, allowing the system to calculate the object’s location based on the time and speed of sound.

• Sonar is widely used for navigating, mapping the ocean floor, detecting submerged objects like submarines, and conducting scientific research.

• It is especially useful in marine environments, where visibility is low, and other technologies like radar do not function effectively underwater due to the attenuation of electromagnetic waves.

• Sonar systems are classified into two types: active sonar (which emits sound waves and listens for echoes) and passive sonar (which only listens for sounds made by other objects). Both play vital roles in underwater navigation and exploration.

• The applications of sonar include military purposes (submarine detection, mine hunting), commercial uses (fish finding, underwater oil exploration), and scientific research (mapping oceanic structures).

• Hence, the correct answer is Sonar.

Additional Information

• Technologies Mentioned in the Question:

• Sonar: Used for underwater exploration, navigation, and object detection. It is highly effective in water where visibility is limited. Applications include military submarines, undersea exploration, and commercial fishing.

• LiDAR: (Light Detection and Ranging) uses laser light to measure distances. It is primarily used for mapping and surveying land-based terrains, not underwater applications, as light cannot penetrate water efficiently.

• Echo-sounder: A specialized form of sonar used in marine environments to measure the depth of water and locate the seabed. It is commonly used in hydrographic surveys.

• SAR: (Synthetic Aperture Radar) uses microwave radar technology to create two-dimensional images of objects, such as landscapes or buildings. It is not suitable for underwater object detection.

• Sonar in Detail:

• Active Sonar: Emits sound waves and analyzes the echo for distance, size, and shape of the object. Used in military applications like submarine tracking and anti-mine operations.

• Passive Sonar: Only listens to sounds generated by underwater objects. Widely used in detecting marine life, ships, and submarines.

• Key Applications: Includes ocean floor mapping, fish population tracking, underwater archaeology, and disaster management

(e.g., detecting underwater earthquakes).

• Important Characteristics:

• Sonar technology is reliable in underwater environments due to the efficient propagation of sound waves in water compared to electromagnetic waves (used in radar).

• The speed of sound in water is approximately 1500 meters per second, allowing accurate calculations of object distance and location.

Important Points

• Key Advantages of Sonar:

• Sonar is effective in environments where visibility is limited, such as deep-sea exploration or murky waters.

• It can detect both stationary and moving objects, making it versatile for different applications.

• Limitations of Sonar:

• The accuracy of sonar can be affected by water conditions such as temperature, salinity, and pressure.

• Sonar systems can face interference from marine life or other sound sources in the water.

Q11. Answer: (a) Goa

The correct answer is Goa.

Key Points

• India's first exploration license auction and AI-Driven Mineral Targeting Hackathon were launched in Goa.

• The event marked a significant step toward modernizing the mineral exploration process in India.

• The initiative aims to utilize artificial intelligence (AI) and data-driven techniques for efficient mineral targeting and exploration. Hence, Goa is the correct answer.

• Goa, as a state, has been historically significant for its rich mineral deposits, particularly iron ore, making it an ideal location for such advancements.

• The hackathon and auction are expected to enhance transparency and efficiency in the mining sector. Hence, this initiative was launched in Goa.

Additional Information

• Mineral Exploration in India:

• Mineral exploration is a critical process for discovering and harnessing natural resources. It involves identifying potential sites for mining and evaluating their economic viability.

• India is rich in mineral resources, including coal, iron ore, bauxite, and limestone. The mining industry contributes significantly to the economy.

• Artificial Intelligence in Mineral Exploration:

• AI-driven techniques enable the analysis of large datasets to identify potential mineral-rich areas. These methods are faster and more accurate than traditional exploration techniques.

• Machine learning algorithms can predict locations with high mineral potential by analyzing geological, geophysical, and geochemical data.

• Significance of Goa:

• Goa is known for its abundant deposits of iron ore. The state has been a hub for mining activities for decades.

• The launch of the exploration license auction and hackathon in Goa highlights its importance in the mining and mineral exploration sector.

Important Points

• Benefits of AI in Mineral Exploration:

• Efficiency: AI reduces the time and cost required for mineral exploration by analyzing data swiftly and accurately.

• Accuracy: Machine learning models can identify mineral-rich areas with higher precision, minimizing errors.

• Government Initiatives in Mining Sector:

• National Mineral Policy: The government has introduced policies to promote sustainable mining and exploration practices.

• Exploration License Auctions: These auctions aim to provide transparency in the allocation of mining rights and attract private investment.

Q12. Answer: (c) HOAC Combo

The correct answer is HOAC Combo.

Key Points

• HOAC Combo is a patented respiratory device developed by AIIMS Raipur, introduced in May 2025, to help curb the spread of airborne infections. This statement is correct.

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• The device is designed specifically to reduce the transmission of infectious pathogens that spread through the air, such as the ones causing respiratory illnesses. Its innovative design ensures better protection for healthcare professionals and patients. This statement is correct.

• The development of HOAC Combo is a step forward in addressing the increasing concerns regarding infections in healthcare settings. It is particularly relevant in the context of outbreaks and pandemics like COVID-19. This statement is correct.

• AIIMS Raipur has been at the forefront of healthcare innovation, and the HOAC Combo device is one of the latest contributions by the institute in the field of public health. This statement is correct.

• The HOAC Combo device uses advanced filtration technology and materials to ensure the effective trapping of harmful particles and pathogens in the air. This enhances its utility in medical settings. This statement is correct.

Additional Information

• AIIMS Raipur:

• AIIMS Raipur, part of the All India Institute of Medical Sciences network, is a premier medical institution known for its excellence in healthcare and research.

• It has been actively involved in developing innovative solutions to address healthcare challenges, such as the HOAC Combo device for airborne infections.

• Airborne Infections:

• Airborne infections are caused by pathogens like bacteria, viruses, or fungi that are transmitted through the air.

• Examples include diseases like tuberculosis (TB), influenza, and COVID-19.

• The spread of such infections is a major concern in healthcare settings, where patients and healthcare workers are at high risk.

• Features of HOAC Combo:

• The device integrates advanced filtration systems to block airborne particles effectively.

• It is designed to be lightweight, portable, and user-friendly, making it suitable for use in a variety of medical and non-medical settings.

• Its application is particularly beneficial in hospitals, quarantine zones, and areas with a high risk of infection transmission.

Important Points

• Importance of HOAC Combo:

• Devices like the HOAC Combo play a critical role in protecting individuals from airborne pathogens, especially during pandemics or outbreaks.

• They ensure that healthcare workers can continue their work safely without the constant threat of infection.

• Role of Innovation in Public Health:

• Innovations like HOAC Combo reflect the importance of integrating technology and research to address public health challenges.

• Such developments demonstrate the capability of Indian institutions to contribute to global healthcare advancements.

Q13. Answer: (a) selling government's share in public sector companies

The correct answer is selling government's share in public sector companies.

Key Points

• The term disinvestment refers to the process of the government selling its stake in public sector undertakings (PSUs) to private entities or the public. This is done to reduce the financial burden on the government and to improve efficiency in these enterprises.

• Disinvestment in India gained momentum during the 1991 economic reforms when India liberalized its economy to address the balance of payments crisis and introduced structural reforms.

• Disinvestment is aimed at raising resources for the government and promoting private-sector participation in industries to improve competition, operational efficiency, and profitability.

• Under disinvestment, the government may sell a part or whole of its equity in PSUs to private entities or individuals through mechanisms like public offers, strategic sales, or auctions.

• The proceeds from disinvestment are used for purposes like reducing the fiscal deficit, infrastructure development, and funding social welfare programs. Hence, the correct answer is selling government's share in public sector companies.

Additional Information

• Objectives of Disinvestment:

• To reduce the financial burden of the government and generate revenue for developmental projects.

• To improve the efficiency and competitiveness of public sector enterprises.

• To promote wider participation by the private sector and the public, ensuring greater accountability and transparency.

• Methods of Disinvestment:

• The government can undertake strategic sales, where it sells a significant portion of its shareholding in PSUs to private entities.

• Public offers involve the sale of shares in PSUs to the general public through the stock market.

• Examples of Disinvestment in India:

• 1999: Modern Foods was sold to Hindustan Unilever, marking one of the first major strategic sales.

• 2000s: Companies like VSNL, Balco, and Hindustan Zinc were divested to private entities.

• Recent examples: The government has divested its stake in companies like Air India (2021) and LIC (2022).

Important Points

• Key Legal Framework:

• Disinvestment policies are governed by the Department of Investment and Public Asset Management (DIPAM), which oversees the disinvestment process.

• The government also sets annual targets for disinvestment in its Union Budget.

• Challenges in Disinvestment:

• Resistance from labor unions and employees of PSUs due to job security concerns.

• Opposition from political entities who view disinvestment as a loss of national assets.

• Difficulty in finding suitable buyers for loss-making enterprises.

Q14. Answer: (a) Government of India Act, 1935

The correct answer is Government of India Act, 1935.

Key Points

• The Government of India Act, 1935 was the most comprehensive and influential legislation passed by the British Parliament for the governance of India during the colonial period.

• This Act laid the foundation for the institutional framework of India's administrative system, which was later adopted and modified in the Indian Constitution.

• It introduced the concept of Federal Governance, where powers were divided between the Centre and Provinces, a feature retained in the Indian Constitution. Hence, statement is correct.

• The Act established bicameral legislatures at the provincial level, similar to the parliamentary structure India later adopted.

• It provided for the separation of powers between the judiciary and the executive, an essential feature of modern democratic systems. Hence, statement is correct.

• The Act also introduced provisions for provincial autonomy, giving more powers to provinces, which influenced the federal structure of the Indian Constitution.

• It was the first legislation to propose the establishment of an All-India Federation, though it was not implemented due to resistance from princely states. Hence, statement is correct.

• Many of the administrative and legislative structures introduced by the Act were adopted by the framers of the Indian Constitution, with modifications to suit the needs of an independent nation. Hence, statement is correct.

• Hence, the correct answer is Government of India Act, 1935.

Additional Information

• Government of India Act, 1935:

• This Act was enacted by the British Parliament in 1935 and was the longest legislation ever passed by Britain for India.

• It provided for the establishment of an All-India Federation, which included British Indian provinces and princely states. However, this federation was not implemented due to political challenges.

• The Act introduced provincial autonomy, a significant step in decentralizing governance, allowing provinces to function as autonomous units.

• It also introduced a Federal Court in 1937, which later became the Supreme Court of India after Independence.

• Key Features of the Act:

• The Act divided powers into three lists: Federal List, Provincial List, and Concurrent List, which provided the basis for power-sharing in the Indian Constitution.

• It abolished dyarchy at the provincial level but introduced it at the Centre, where responsibilities were divided between ministers and the Governor-General.

• The Act introduced direct elections, increasing political representation for Indians.

• It formed the basis of India's administrative structure, including parliamentary democracy and federalism.

Important Points

• Other Acts Mentioned in Options:

• Rowlatt Act, 1919: This Act allowed the British government to imprison individuals suspected of sedition without trial. It led to widespread protests, including the Jallianwala Bagh massacre. However, it did not contribute to India's constitutional framework.

• Indian Councils Act, 1909: Known as the Morley-Minto reforms, this Act introduced reforms like separate electorates for Muslims but had limited impact on the Indian Constitution.

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• Indian Independence Act, 1947: This Act declared India and Pakistan independent dominions but was focused on the process of granting independence rather than institutional frameworks.

• Influence on the Indian Constitution:

• Many provisions of the Government of India Act, 1935, such as federal structure and separation of powers, were adopted and modified by the framers of the Indian Constitution.

• The Act served as a blueprint for drafting the Indian Constitution and laid the foundation of governance in Independent India.

Q15. Answer: (b) Ruling on POCSO Act

The correct answer is Ruling on POCSO Act.

Key Points

• Justice Bela Trivedi delivered a landmark judgment related to the POCSO Act (Protection of Children from Sexual Offences Act), emphasizing the protection of minors from sexual offenses.

• The judgment focused on interpreting provisions of the act to ensure robust safeguarding mechanisms for children against exploitation and abuse.

• The court highlighted the importance of ensuring child-friendly procedures during investigation and trial, aligning with the objectives of the POCSO Act. Hence, the correct option is "Ruling on POCSO Act."

• Justice Bela Trivedi stressed the critical role of the judiciary in upholding the principles enshrined in the POCSO Act, ensuring justice and protection for victims of sexual abuse.

Additional Information

• POCSO Act:

• The Protection of Children from Sexual Offences Act was enacted in 2012 to strengthen legal provisions against sexual offenses committed against minors.

• The act defines various sexual offenses against children, including penetrative sexual assault, sexual harassment, and the use of children for pornography.

• The law mandates child-friendly investigation and trial procedures, such as recording statements in safe environments and ensuring the identity of victims is protected.

• Key Features of the POCSO Act:

• Provisions for stringent punishment for sexual offenses against minors, including life imprisonment for severe cases.

• Establishes special courts for speedy trial of cases involving child sexual abuse.

• Mandates reporting of sexual offenses against children by individuals who are aware of such crimes.

• Justice Bela Trivedi’s Contribution:

• Known for delivering judgments that emphasize the importance of safeguarding vulnerable groups, including children.

• Her landmark ruling on the POCSO Act reinforced the need for strict adherence to the law and protection of victims.

Important Points

• Key Legal Provisions:

• The POCSO Act mandates the establishment of special courts to expedite trials of sexual offenses against minors.

• The act ensures that the identity of the child victim is protected throughout the legal process.

• Justice Bela Trivedi’s judgment on this act underscores the importance of child-sensitive procedures and strict punishment for offenders.

Q16. Answer: (c) Ur

The correct answer is Ur.

Key Points

• The Pallava administration was characterized by a well-organized structure of governance, with administrative divisions based on geographical and functional units.

• The smallest administrative unit directly managed by local self-governing assemblies during the Pallava period was the Ur, which referred to a village or settlement.

• The Ur was a local self-governing unit where decisions regarding village administration, revenue collection, and disputes were handled. Hence, Ur was the smallest administrative unit.

• Other administrative divisions such as Nadu, Mandala, and Kottam were larger units that encompassed multiple villages or regions, but they were not directly managed by the village assemblies. Hence, options 1, 2, and 4 are incorrect.

• The Pallava administration promoted local governance, enabling villages to play a significant role in managing their affairs. This decentralized structure was crucial for maintaining administrative efficiency. Thus, the correct answer is Ur.

Additional Information

• Pallava Administration:

• The Pallavas ruled parts of southern India, particularly Tamil Nadu, from the 6th to 9th century CE. Their governance model included both central and local administrative structures.

• The administrative divisions included Ur (village), Nadu (district), Mandala (province), and Kottam (region). These units ensured efficient governance and catered to local needs.

• Ur:

• Ur was the smallest administrative unit and referred to a village or settlement. It was directly managed by local assemblies and played a pivotal role in self-governance.

• Villages under the Ur had assemblies that handled issues like revenue collection, dispute resolution, and land management, reflecting a decentralized governance model.

• Nadu:

• Nadu was a larger administrative unit encompassing multiple villages. It served as a district and was overseen by officials appointed by the central authority.

• Unlike Ur, Nadu was not directly managed by village assemblies but contributed to the overall governance and administration of the region.

• Mandala and Kottam:

• Mandala referred to provinces or divisions within the Pallava empire, often managed by higher officials or governors.

• Kottam was another regional division, larger than Nadu, and served as an administrative zone within the Pallava empire.

Important Points

• Key Features of Pallava Governance:

• The decentralized structure allowed local self-governance, empowering villages and assemblies to manage their affairs efficiently.

• The Pallavas maintained a balance between centralized and decentralized administration, ensuring both local and regional governance.

• Significance of Ur:

• The village assembly of Ur was responsible for decisions related to land revenue, irrigation, and dispute resolution, making it a vital unit of governance.

• The system reflected a strong tradition of self-governance in ancient southern India under the Pallavas.

Q17. Answer: (c) They release OH^− ions in water.

The correct answer is They release OH- ions in water..

Key Points

• Acids are chemical substances that exhibit specific characteristics when dissolved in water.

• They turn blue litmus paper red, which is a common test to identify acidic substances. This statement is correct.

• Acids generally have a sour taste. For example, lemon juice contains citric acid, which tastes sour. This statement is correct.

• Acids react with bases to form salt and water. This reaction is called neutralization. This statement is correct.

• Acids release H^+ ions (protons) when dissolved in water, not OH^- ions. The release of OH^- ions is a characteristic property of bases. Hence, this statement is incorrect and is the correct answer.

Additional Information

• Characteristics of Acids:

• Acids are substances that produce hydrogen ions (H^+) when dissolved in water. For example, hydrochloric acid (HCl) dissociates into H^+ and Cl^- in water.

• They have a sour taste (e.g., vinegar contains acetic acid, and lemon contains citric acid).

• Acids react with metals to release hydrogen gas. For instance, hydrochloric acid reacts with zinc to produce hydrogen gas.

• They change the color of indicators: Blue litmus paper turns red in the presence of acids.

• Acids react with carbonates and bicarbonates to produce carbon dioxide gas.

• Differences Between Acids and Bases:

• Acids: Produce H^+ ions, taste sour, turn blue litmus paper red, and have a pH below 7.

• Bases: Produce OH^- ions, taste bitter, feel slippery, turn red litmus paper blue, and have a pH above 7.

• Examples of Acids and Bases:

• Acids: Hydrochloric acid (HCl), Sulfuric acid (H2SO4), Nitric acid (HNO3), Acetic acid (CH3COOH).

• Bases: Sodium hydroxide (NaOH), Potassium hydroxide (KOH), Calcium hydroxide (Ca(OH)2), Ammonium hydroxide (NH4OH).

Important Points

• pH Scale:

• The pH scale ranges from 0 to 14 and measures the acidity or alkalinity of a solution.

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• A pH less than 7 indicates acidity, while a pH greater than 7 indicates alkalinity.

• A pH of exactly 7 is considered neutral, as seen in pure water.

• Neutralization Reaction:

• When an acid reacts with a base, it forms salt and water in a process called neutralization.

• Example: HCl + NaOH → NaCl + H2O (hydrochloric acid reacts with sodium hydroxide to form sodium chloride and water).

• Applications of Acids and Bases:

• Acids: Used in cleaning agents (e.g., hydrochloric acid), food preservation (e.g., vinegar), and production of fertilizers (e.g., sulfuric acid).

• Bases: Used in soap making (e.g., sodium hydroxide), antacids (e.g., magnesium hydroxide), and cleaning agents (e.g., ammonia).

Q18. Answer: (c) Kerala

The correct answer is Kerala.

Key Points

• Narayana Guru was one of the most prominent social reformers from the state of Kerala. He was born in Chempazhanthy, Kerala, in 1856 and worked tirelessly against caste-based discrimination.

• He was a spiritual leader, philosopher, and social reformer who strongly opposed the rigid caste system prevalent in society during his time. He also emphasized the importance of education and equality.

• Narayana Guru's philosophy was based on the principles of oneness of humanity and the abolition of caste discrimination. He propagated the idea of "One Caste, One Religion, One God for All."

• He established several temples in Kerala, which were open to people from all castes, challenging the orthodox Hindu tradition of restricting lower castes from entering temples. This was a significant step in promoting equality. Hence, Kerala is the correct answer.

• Apart from his religious reforms, Narayana Guru also worked to uplift the social and economic conditions of the oppressed sections of society through education and cultural activities.

Additional Information

• Background of Narayana Guru:

• Narayana Guru was born into the Ezhava community, which was considered a lower caste in Kerala's social hierarchy. He worked relentlessly to uplift the marginalized communities.

• He founded the Sree Narayana Dharma Paripalana (SNDP) Yogam in 1903, an organization aimed at eradicating caste discrimination and promoting education and social reform.

• Key Contributions:

• He consecrated the Aruvippuram Shiva Temple in 1888, where he broke caste norms by allowing all castes to worship.

• He established a number of educational institutions and temples to promote equality and upliftment of the downtrodden.

• His teachings emphasized the need for social justice, self-reliance, and spiritual enlightenment as a means to eradicate caste-based discrimination.

• Philosophy:

• His famous philosophy, "One Caste, One Religion, One God for All," became a guiding principle for social reform movements in Kerala.

• He believed in the universal brotherhood of mankind and emphasized that all humans are equal regardless of caste or creed.

• Legacy:

• His contributions to social reform have had a lasting impact on Kerala's society, inspiring generations to fight against inequality and caste discrimination.

• Today, Narayana Guru is celebrated as a symbol of equality, and his teachings continue to inspire social reformers across India.

Important Points

• Other Important Social Reformers in India:

• Raja Ram Mohan Roy: Known as the "Father of the Indian Renaissance," he worked for the abolition of sati and promoted women's education.

• Jyotirao Phule: He worked for the upliftment of women and lower castes and founded the Satyashodhak Samaj.

• Dr. B.R. Ambedkar: The chief architect of the Indian Constitution, Ambedkar led movements against untouchability and fought for Dalit rights.

• Kerala’s Social Reform Movement:

• Kerala witnessed several social reform movements in the late 19th and early 20th centuries, led by leaders like Narayana Guru, Ayyankali, and Chattampi Swamikal.

• These movements were instrumental in eradicating social evils like untouchability and promoting education and gender equality

in the state.

Q19. Answer: (c) Due to enrollment of learners outside the official age group

The correct answer is Due to enrollment of learners outside the official age group.

Key Points

• Gross Enrollment Ratio (GER): GER is a statistical measure used to determine the percentage of students enrolled in a specific level of education, regardless of age, as compared to the official age group corresponding to that level.

• GER can exceed 100% when students outside the official age group enroll in schools or educational institutions. For example, older learners who previously missed out on education or younger students enrolling earlier can contribute to GER exceeding 100%. Hence, statement 3 is correct.

• The inclusion of learners outside the age group indicates that the educational system accommodates students who are not in the typical age range for a specific level of education. This is common in cases of adult education or delayed enrollment.

• Examples: A country may see GER exceed 100% due to specific educational policies encouraging enrollment among over-aged or under-aged students. For instance, in many developing nations, adult learners returning to school increase the GER.

• GER exceeding 100% is not an error but rather a reflection of the inclusivity of the educational system, showing that education is accessible to individuals outside the official age group.

Additional Information

• Factors Affecting GER:

• Delayed Enrollment: Students who join school later than the official age group due to socio-economic challenges or personal circumstances contribute to GER exceeding 100%.

• Early Enrollment: In some cases, children younger than the official age group may start schooling early, resulting in higher GER.

• Adult Education Programs: Countries with adult literacy programs often see older learners enrolling in schools, which impacts GER.

• Key Features of GER:

• GER includes all students enrolled at a particular level of education, irrespective of their age, making it a comprehensive indicator of educational participation.

• It reflects the inclusiveness of the educational system and measures the overall capacity and outreach of schools.

• Global Perspective:

• In developed countries, GER is usually close to 100%, as most students enroll within the official age group, whereas in developing countries, GER may exceed 100% due to factors like delayed enrollment or adult education programs.

• Example: UNESCO data often shows GER exceeding 100% in countries with strong policies on adult literacy and inclusive education.

Important Points

• Differences Between GER and Net Enrollment Ratio (NER):

• NER: Refers to the percentage of students within the official age group enrolled in school, making it a stricter measure compared to GER.

• GER: Includes students of all ages, and thus often exceeds 100%, especially in cases of inclusivity.

• Policy Implications:

• Governments often use GER data to formulate policies for improving access to education for marginalized groups.

• Example: Programs like India’s Sarva Shiksha Abhiyan aim to increase enrollment across all age groups.

Q20. Answer: (c) Selecting the file and pressing Shift + Delete keys

The correct answer is Selecting the file and pressing Shift + Delete keys.

Key Points

• Dragging the file to the Recycle Bin: When a file is dragged and dropped into the Recycle Bin, it is only temporarily deleted and can be restored later if needed. Hence, this statement is incorrect.

• Right-clicking on the file and selecting 'Delete': This action moves the file to the Recycle Bin, allowing recovery unless the bin is emptied manually. Hence, this statement is incorrect.

• Selecting the file and pressing Shift + Delete keys: This action bypasses the Recycle Bin and permanently deletes the file from the system. Once deleted, recovery is not possible through regular methods. Hence, this statement is correct.

• Pressing the Delete key: Pressing the Delete key moves the file to the Recycle Bin, enabling restoration unless emptied. Hence, this statement is incorrect.

• Hence, the correct answer is Selecting the file and pressing Shift + Delete keys.

Additional Information

• Understanding File Deletion in Windows:

• Temporary Deletion: Actions like dragging files to the Recycle Bin or pressing the Delete key temporarily remove files from their original location and store them in the Recycle Bin, enabling restoration.

• Permanent Deletion: Using the Shift + Delete keys skips the Recycle Bin and directly removes the file from the system. This is irreversible without specialized recovery tools.

• Functions of the Recycle Bin:

• The Recycle Bin acts as a safeguard, allowing users to restore accidentally deleted files.

• Files remain in the Recycle Bin until it is manually emptied or reaches its storage limit.

• Key Features of Shift + Delete:

• Bypasses the Recycle Bin, ensuring files are permanently removed from the system.

• Useful for deleting sensitive files that should not be recoverable.

Important Points

• Recovery Options for Permanently Deleted Files:

• Data Recovery Tools: Specialized software like Recuva or EaseUS Data Recovery Wizard can sometimes recover permanently deleted files.

• Backup Solutions: Regularly backing up data ensures that files can be restored even if deleted permanently.

• Preventing Accidental Permanent Deletion:

• Confirmation Prompt: Windows often displays a confirmation dialog when using Shift + Delete, ensuring the user intends to permanently delete the file.

• Data Organization: Properly organizing files and using backup systems minimizes the risk of accidental deletion.

Q21. Answer: (b) New Delhi

The correct answer is New Delhi.

Key Points

• The construction of a 27-metre-tall clock tower is a project initiated in New Delhi at the Talkatora Roundabout.

• The purpose of this clock tower is to enhance the architectural identity and aesthetic appeal of the city, which is renowned for its historical landmarks.

• This project aims to blend modern architecture with traditional aesthetics, symbolizing New Delhi’s cultural and historical heritage.

• The location, Talkatora Roundabout, is a prominent intersection in New Delhi and is strategically chosen to maximize visibility and accessibility.

• The clock tower is expected to become a key tourist attraction and a landmark in the capital city, adding to its charm and urban landscape.

• New Delhi, being the capital of India, is known for its focus on urban development, and this project aligns with its continuous efforts to modernize its infrastructure while preserving its cultural ethos.

• This initiative also reflects the city's vision of promoting tourism and enhancing the experience of both residents and visitors. Hence, the correct answer is New Delhi.

Additional Information

• New Delhi:

• New Delhi is the capital city of India and serves as the center of the government and administrative activities.

• It is known for its blend of historical landmarks, such as the India Gate, Rashtrapati Bhavan, and Qutub Minar, along with modern infrastructure.

• Clock Towers in India:

• Clock towers have historically been constructed in India as symbols of urban development and civic pride.

• Examples include the Husainabad Clock Tower in Lucknow, which is one of the tallest clock towers in India, and the Rajabai Clock Tower in Mumbai, known for its Gothic architecture.

• Architectural Significance:

• The incorporation of clock towers in modern cities symbolizes the connection between historical architecture and contemporary designs.

• These structures also serve as functional landmarks and contribute to city aesthetics, making them tourist attractions.

Important Points

• Historical Clock Towers in India:

• Husainabad Clock Tower: Located in Lucknow, it is a 67-meter tall structure built in 1881 by the British during colonial rule.

• Rajabai Clock Tower: Situated in Mumbai, this 85-meter tall tower was built in 1878 and is inspired by the Big Ben of London.

• Urban Development in New Delhi:

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• New Delhi has witnessed numerous urban projects aimed at improving infrastructure, such as the Delhi Metro, flyovers, and green initiatives.

• The construction of the 27-meter clock tower aligns with the city's vision of becoming a world-class urban center while preserving its historical identity.

Q22. Answer: (c) Ctrl + Shift + Esc

The correct answer is Ctrl + Shift + Esc.

Key Points

• The Task Manager in Windows is a system monitor program used to provide information about the computer's performance and running software. It is also used to end processes and monitor system resources.

• The Ctrl + Shift + Esc shortcut is the quickest and most direct way to open the Task Manager in Windows. This combination directly launches Task Manager without any intermediary steps. Hence, this is the correct option.

• Other shortcuts like Alt + Tab allow users to switch between open programs and windows but do not open the Task Manager. Hence, this option is incorrect.

• The shortcut Alt + F4 closes the active window or program but does not access the Task Manager. Hence, this option is incorrect.

• The Ctrl + Tab shortcut is used to switch between tabs in a browser or document but does not open the Task Manager. Hence, this option is incorrect.

• The Task Manager can also be accessed using the Ctrl + Alt + Del combination, which opens a menu with several options, including Task Manager. However, this combination involves an extra step and is not as direct as Ctrl + Shift + Esc.

Additional Information

• Features of Task Manager:

• The Task Manager provides insights into CPU usage, memory usage, disk activity, and network usage. It helps in diagnosing performance issues on a computer.

• Users can view and terminate running processes or applications that are unresponsive. This is essential for troubleshooting software issues.

• The Task Manager also allows users to manage startup programs, enabling them to improve the boot time of their system.

• Methods to Access Task Manager:

• Using Ctrl + Shift + Esc is the fastest method.

• Right-clicking on the Taskbar and selecting "Task Manager" is another common way to access it.

• Pressing Ctrl + Alt + Del and selecting "Task Manager" from the menu is an additional method.

Important Points

• Alt + Tab: This shortcut is used to switch between open applications but does not open the Task Manager.

• Alt + F4: This shortcut is used to close the currently active window or program.

• Ctrl + Shift + Esc: This is the most direct shortcut to access the Task Manager without any intermediate steps.

• Ctrl + Tab: This is used to navigate between tabs in a browser or document, and it does not open the Task Manager.

• Alternative Access: Task Manager can also be opened by searching for it in the Start menu or using the Run command (Win + R) and typing taskmgr.

Q23. Answer: (b) Devotional poetry

The correct answer is Devotional poetry.

Key Points

• Devotional poetry flourished in medieval India from the 11th to 18th centuries, primarily driven by the Bhakti movement.

• The Bhakti movement emphasized devotion to a personal deity and rejected orthodox rituals, caste discrimination, and rigid religious practices. This led to the creation of deeply emotional and spiritual poetry. Hence, devotional poetry became the most prominent form of literature during this period.

• Devotional poetry was written in regional languages like Hindi, Tamil, Telugu, Kannada, Bengali, Marathi, and Gujarati, making it accessible to the common masses. This facilitated the spread of religious and cultural ideas across India.

• Key poets of this era included Mirabai, Kabir, Tulsidas, Surdas, Basava, and Andal, among others, who composed poetry filled with deep devotion toward deities like Krishna, Rama, Shiva, and Vishnu.

• The themes of devotional poetry included love for God, surrender, spiritual enlightenment, and critique of social hierarchies. These compositions inspired reforms in society and religion. Hence, devotional poetry reflected the socio-religious transformations of medieval India.

• Devotional poetry also fostered a sense of cultural unity by promoting universal values like love, compassion, and equality, which transcended caste and religious boundaries.

• Hence, the correct answer is Devotional poetry.

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Additional Information

• Characteristics of Devotional Poetry:

• Devotional poetry often used simple language and vivid imagery, allowing it to resonate with people across different strata of society.

• It was composed in regional languages, which made it accessible to the local communities, unlike the Sanskrit texts that were limited to the elite and priestly classes.

• Example: Tulsidas's Ramcharitmanas in Awadhi, Surdas's poems on Krishna, and Mirabai's compositions in Rajasthani reflected the strong spiritual connection of the poets with their deities.

• Bhakti Movement:

• The Bhakti movement was a key factor in the rise of devotional poetry. It originated in South India during the 6th-9th centuries and later spread to North India.

• Saints like Alvars and Nayanars were instrumental in promoting devotion through poetic compositions dedicated to Vishnu and Shiva.

• Key Figures: Kabir, who criticized religious orthodoxy; Mirabai, who expressed unconditional love for Krishna; and Tulsidas, who popularized devotion to Rama.

• Impact of Devotional Poetry:

• It played a crucial role in social reform, challenging caste discrimination and promoting equality.

• Devotional poetry also influenced art, music, and dance forms, leading to the development of Bhajans, Kirtans, and other cultural expressions.

• These poetic works continue to be a source of spiritual inspiration and cultural heritage in modern India.

Important Points

• Comparison of Other Literature Forms in Medieval India:

• While theatrical historical performances were present, they were not as widespread or influential as devotional poetry during this period.

• Elaborate philosophical discussions were significant among scholars and the elite but did not reach the masses as extensively as devotional poetry.

• Specialized scientific writings, though important, were limited to specific circles and did not have the mass appeal of devotional poetry.

• Legacy of Devotional Poetry:

• Devotional poetry remains a key component of Indian culture, influencing contemporary art, literature, and spirituality.

• It bridges the gap between the past and present, connecting people with their spiritual and cultural heritage.

Q24. Answer: (b) 2005

The correct answer is 2005.

Key Points

• The Right to Information Act was passed by the Parliament of India in the year 2005. It became effective on 12th October 2005.

• This act empowers the citizens of India to seek information from public authorities, thus promoting transparency and accountability in governance. Hence, the correct option is 2005.

• The RTI Act covers all levels of government—central, state, and local. It mandates that public authorities must provide information within 30 days of receiving a request.

• The act also recognizes the right to access information as a fundamental right, which is linked to Article 19(1)(a) of the Constitution of India, guaranteeing the freedom of speech and expression.

• Hence, the correct answer is 2005.

Additional Information

• Right to Information Act, 2005:

• The RTI Act was enacted to enhance accountability and transparency in government operations. It allows citizens to obtain information from public authorities, improving governance and reducing corruption.

• Under this act, any citizen can file an RTI application to seek information. The public authority is obligated to reply within 30 days. In cases of life or liberty concerns, the information must be provided within 48 hours.

• Key Features of RTI Act:

• Coverage: It applies to all constitutional authorities, including the executive, legislature, and judiciary, as well as bodies owned, controlled, or substantially financed by the government.

• Exemptions: Certain information is exempt under the act, such as matters affecting national security, trade secrets, and personal information that may invade privacy.

• Public Information Officers (PIOs): Each public authority is required to designate PIOs to handle requests and provide

information under this act.

• Impact of RTI:

• The RTI Act has strengthened democracy by empowering citizens to question government actions and decisions.

• It has played a significant role in combating corruption by exposing irregularities and ensuring accountability.

• Several landmark RTI cases have led to policy changes and increased transparency in public services.

Important Points

• Key Legal Provisions:

• The act includes provisions for appeals if information is denied. Citizens can approach the Central Information Commission or State Information Commission.

• RTI empowers citizens to hold public authorities accountable. However, misuse of RTI can lead to frivolous applications, which sometimes burden the system.

• Examples of RTI Success Stories:

• An RTI query in 2008 revealed the details of funds allocated under the Member of Parliament Local Area Development Scheme (MPLADS), exposing misuse.

• RTI was instrumental in uncovering irregularities in the Commonwealth Games held in India in 2010.

• Information sought under RTI has been used to challenge unlawful practices and ensure justice in various cases.

Q25. Answer: (a) Velu Thampi

The correct answer is Velu Thampi.

Key Points

• Velu Thampi was a prominent freedom fighter from the princely state of Travancore, located in present-day Kerala.

• He served as the Dewan of Travancore during the early 19th century under the reign of Maharaja Balarama Varma.

• The Kundara Proclamation was issued by Velu Thampi on January 11, 1809, urging the people of Travancore to rise against the British East India Company. Hence, statement 1 is correct.

• The proclamation was a call to arms against the oppressive policies of the British, who exploited the resources of the region and undermined the sovereignty of local rulers.

• Velu Thampi's leadership played a pivotal role in organizing resistance against the British, highlighting his commitment to the cause of independence. Hence, statement 2 is correct.

• The rebellion led by Velu Thampi was a significant part of the early resistance movements against colonial rule in India, showcasing the courage and determination of the people of Travancore.

• The proclamation symbolized the strong opposition to colonial exploitation and served as a rallying cry for freedom fighters in the region. Hence, statement 3 is correct.

• Despite his valiant efforts, the rebellion was suppressed by the British, and Velu Thampi tragically died in 1809, marking the end of his struggle against colonial rule. Hence, statement 4 is correct.

• Hence, the correct answer is Velu Thampi.

Additional Information

• Velu Thampi:

• Velu Thampi was known for his administrative skills and commitment to the welfare of the people of Travancore.

• He was deeply opposed to British interference in the internal affairs of the state and their exploitative taxation policies.

• His leadership in the rebellion marked him as one of the early leaders in the Indian freedom struggle, long before the organized movements of the late 19th and early 20th centuries.

• Kundara Proclamation:

• The Kundara Proclamation was issued from Kundara, a place in Travancore. It remains a significant historical event symbolizing resistance against colonial rule.

• The proclamation emphasized the importance of unity among the people to fight against the oppressive policies of the British East India Company.

• It called for the mobilization of local forces, showcasing the spirit of defiance and the desire for independence.

• Significance of Early Freedom Fighters:

• Figures like Velu Thampi paved the way for future leaders of the Indian freedom struggle by demonstrating the importance of resistance against colonial oppression.

• Their sacrifices and struggles are remembered as a testament to the early opposition to British rule in India.

Important Points

• Other Freedom Fighters:

• Wazir Ali Khan: A ruler of Awadh who resisted British interference but is not associated with the Kundara Proclamation.

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• Gajapatiraju: A freedom fighter from Andhra Pradesh who contributed to regional resistance but not linked to the Kundara Proclamation.

• Kattabomman Nayakan: A Tamil ruler and freedom fighter who resisted the British but his efforts were separate from Velu Thampi's rebellion.

• Legacy of Velu Thampi:

• Velu Thampi is celebrated as a symbol of courage and resistance against colonial rule, particularly in Kerala.

• His actions, including the Kundara Proclamation, are remembered as a significant part of the early freedom struggle in India.

Q26. Answer: (a) 2007

The correct answer is 2007.

Key Points

• Vodafone entered the Indian market in the year 2007.

• Vodafone acquired a 67% stake in Hutchison Essar, one of the leading telecom operators in India, in 2007.

• This acquisition marked Vodafone's official entry into the Indian telecommunications market. Hence, 2007 is the correct answer.

• The acquisition deal was worth 11.1 billion USD, making it one of the biggest international investments in India at the time.

• Vodafone rebranded Hutch and started operating under the name Vodafone Essar, which later became Vodafone India. Hence, the correct year is 2007.

Additional Information

• About Vodafone:

• Vodafone is a British multinational telecommunications company headquartered in London, United Kingdom.

• It is one of the world's largest telecom operators, operating in over 30 countries and partnering with networks in over 50 countries.

• Vodafone focuses on services like mobile telephony, broadband, and digital services.

• Hutchison Essar:

• Hutchison Essar was a joint venture between Hutchison Telecommunications International Limited and Essar Group.

• It was one of the leading telecom operators in India, providing mobile services across several regions.

• The acquisition by Vodafone marked a major milestone in India's telecom industry.

• Impact of Vodafone's Entry:

• Vodafone's entry strengthened competition in the Indian telecom market, leading to better services and innovation.

• It introduced global standards in mobile communication, including better connectivity, roaming services, and customer support.

• Later, Vodafone merged with Idea Cellular in 2018 to form Vodafone Idea Limited, one of India's largest telecom operators.

Important Points

• Telecom Industry in India:

• India is one of the largest telecom markets globally, with over 1.2 billion mobile subscribers.

• It has grown rapidly due to affordable tariffs, technological advancements, and high demand for connectivity.

• Vodafone's Achievements in India:

• Vodafone played a pivotal role in bringing global telecom innovations to India, such as 4G services and advanced mobile apps.

• The company has contributed significantly to India's digital transformation by investing in network infrastructure and services.

Q27. Answer: (c) Gujarat

The correct answer is Gujarat.

Key Points

• Gujarat is one of the leading states in solar power generation in India and continues to hold its position due to favorable policies, geographic advantages, and significant investments.

• The state has implemented ambitious renewable energy programs, including the PM Surya Ghar Muft Bijli Yojana (PMSGMBY), which aims to provide solar-powered electricity to households.

• Under the scheme, Gujarat has aggressively promoted the installation of rooftop solar panels, encouraging households and industries to adopt solar energy. Hence, Gujarat is leading in solar power installations.

• Geographical advantage: Gujarat's climate and geographic location receive abundant solar radiation, making it suitable for large-scale solar power production.

• Gujarat has established dedicated solar parks such as the Charanka Solar Park, which is one of the largest in India. These initiatives are part of the state's renewable energy goals. Hence, Gujarat has emerged as the leader in solar installations.

• Policy framework: Gujarat has introduced strong policy measures to promote renewable energy, including subsidized loans, incentives for rooftop solar installations, and partnerships with private players.

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• These policies have accelerated the adoption of solar energy and contributed to the state's leadership in implementing the PMSGMBY. Hence, Gujarat is the correct answer.

Additional Information

• PM Surya Ghar Muft Bijli Yojana (PMSGMBY):

• This scheme was introduced by the Government of India to promote solar power generation at the household level and provide free electricity to homes using renewable energy.

• It focuses on increasing the adoption of solar panels, particularly rooftop installations, to reduce dependency on conventional power sources and promote sustainability.

• Solar Power in Gujarat:

• Gujarat has taken a leading role in solar energy production, contributing significantly to India's renewable energy targets. The state has a dedicated focus on increasing the share of solar energy in its power grid.

• The state's flagship solar projects include the Charanka Solar Park, which was inaugurated in 2012 and has been a model for other states in India.

• Rooftop Solar Initiatives: Gujarat has incentivized rooftop solar installations, making it easier for households to switch to renewable energy under the PMSGMBY.

• Comparison with other states:

• Maharashtra: While Maharashtra is a leading state in overall energy production, its contribution to solar energy is growing but not as significant as Gujarat's.

• Uttar Pradesh: Uttar Pradesh is focusing on solar energy adoption but faces challenges such as land availability and infrastructure development.

• Tamil Nadu: Tamil Nadu is a leader in wind energy and has significant solar installations but does not surpass Gujarat in solar power generation.

Important Points

• India's Solar Energy Mission:

• India aims to achieve 280 GW of solar energy capacity by 2030 under its National Solar Mission.

• Solar energy is seen as a critical component of India's commitment to the Paris Agreement and its renewable energy goals.

• Economic and Environmental Benefits:

• Solar energy reduces reliance on fossil fuels, lowering carbon emissions and contributing to a sustainable energy future.

• It provides cost-effective electricity to households, industries, and agricultural sectors, boosting economic growth.

Q28. Answer: (c) Wipro Limited

The correct answer is Wipro Limited.

Key Points

• Wipro Limited received the prestigious 'Champion Company' award at the inaugural CII Awards for Excellence in Disability Inclusion in 2025. This recognition highlights Wipro's commitment to fostering inclusivity and creating employment opportunities for individuals with disabilities.

• The CII Awards for Excellence in Disability Inclusion were initiated to honor organizations excelling in disability inclusion, promoting equitable workspaces, and empowering differently-abled individuals. Hence, Wipro's recognition aligns with the award's objectives.

• Wipro Limited has been actively involved in several initiatives aimed at building an inclusive workplace, such as providing assistive technologies, accessible infrastructure, and training programs tailored for employees with disabilities.

• Corporate Social Responsibility (CSR) is a key focus area for Wipro, and the company has integrated disability inclusion as part of its broader sustainability and equity goals.

• This recognition demonstrates Wipro's leadership in promoting diversity, equity, and inclusion (DEI) in the corporate sector. Hence, Wipro Limited's efforts were deemed exemplary for this award.

• Amazon, Zomato, and Minda Corporation were also nominated for their disability inclusion initiatives, but Wipro stood out due to its comprehensive approach and impact in the field.

• Hence, the correct answer is Wipro Limited.

Additional Information

• About Wipro Limited:

• Wipro Limited is an Indian multinational corporation headquartered in Bengaluru, Karnataka, specializing in information technology, consulting, and business process services.

• Wipro has a robust focus on corporate social responsibility, especially in areas like sustainability, education, and inclusion, making it a leader in driving social change through its corporate initiatives.

• Wipro's efforts in disability inclusion include providing accessible infrastructure, assistive technologies, and creating hiring

practices that ensure equitable opportunities for differently-abled individuals.

• CII Awards for Excellence in Disability Inclusion:

• The Confederation of Indian Industry (CII) launched these awards to recognize organizations that excel in fostering disability inclusion and creating a welcoming work environment for people with disabilities.

• These awards aim to promote awareness about disability inclusion and encourage companies to adopt best practices that empower differently-abled individuals.

• Nominees for the Award:

• Amazon: Known for its commitment to accessibility and employment opportunities for differently-abled individuals.

• Zomato: Focuses on providing workplace support for employees with disabilities and creating a diverse workforce.

• Minda Corporation: Recognized for its efforts in workplace accessibility and inclusive practices.

Important Points

• Key Features of Disability Inclusion Initiatives:

• Providing assistive technologies such as screen readers and voice recognition tools to enable differently-abled employees to perform their roles effectively.

• Ensuring accessible infrastructure, including ramps, elevators, and ergonomic workspaces for individuals with physical disabilities.

• Conducting training and awareness programs to sensitize employees about disability inclusion and foster a culture of respect and support.

• Impact of Disability Inclusion:

• Promotes equal opportunities and enhances workplace diversity, leading to improved organizational productivity and innovation.

• Encourages societal acceptance and empowerment of differently-abled individuals, contributing to their overall well-being and independence.

Q29. Answer: (c) Meghalaya and Assam

The correct answer is Meghalaya and Assam.

Key Points

• Greenfield High-Speed Corridor: A Greenfield project refers to infrastructure development starting from scratch without the need to modify or demolish existing structures. It is vital for improving connectivity and economic growth.

• In April 2025, the Cabinet Committee on Economic Affairs approved the development of a Greenfield High-Speed Corridor to connect the states of Meghalaya and Assam. This project is a part of National Highway NH06.

• The corridor is being developed under the Hybrid Annuity Model (HAM), which is a public-private partnership model where the government and private players share the risks and responsibilities for infrastructure projects. Hence, the correct answer is Meghalaya and Assam.

• Importance of NH06: NH06 is a crucial highway connecting the northeastern region of India, aiding in trade, travel, and transportation. Developing a high-speed corridor along this route will improve logistics and reduce travel time.

• The project is expected to enhance connectivity between Assam's economic hubs and Meghalaya's tourist destinations, boosting regional economic activities and tourism. Hence, the importance of this development is significant.

• Hybrid Annuity Mode (HAM): Under HAM, 40% of the total project cost is funded by the government during the construction phase, while the remaining 60% is arranged by private developers. This reduces the financial burden on private players while ensuring accountability. Hence, this model is efficient for infrastructure development.

Additional Information

• Meghalaya:

• Location: Meghalaya is a state in northeastern India, known for its picturesque landscapes, waterfalls, and biodiversity.

• Tourism: Popular tourist destinations include Shillong, Cherrapunji, and Mawsynram, which are known for their scenic beauty and heavy rainfall.

• Economic Activities: Agriculture, forestry, and tourism are key contributors to Meghalaya's economy. The development of the Greenfield High-Speed Corridor is expected to boost tourism and local industries.

• Assam:

• Location: Assam is another northeastern state in India, famous for its tea plantations, silk, and vibrant culture.

• Significance: It serves as an economic hub in the northeastern region, with Guwahati being a major city for trade and commerce.

• Connectivity: Assam's strategic location makes it a gateway to other northeastern states. Improved connectivity through the NH06 corridor will further strengthen this role.

• Hybrid Annuity Model (HAM):

• Key Features: HAM is a financial model for building infrastructure, particularly highways, where the government bears a part of the initial cost, reducing risks for private companies.

• Advantages: It ensures better risk management and efficient project execution, while also providing steady returns for private companies.

• Application: HAM has been widely implemented for infrastructure projects in India, ensuring timely completion and financial sustainability.

Important Points

• Economic Benefits:

• The Greenfield High-Speed Corridor will reduce travel time, improve logistics, and boost economic growth by facilitating trade and tourism between Meghalaya and Assam.

• Environmental Impact: Being a Greenfield project, it is designed to minimize environmental damage by avoiding existing urban and sensitive areas.

• Government Initiatives:

• National Infrastructure Pipeline (NIP): The corridor aligns with India's vision to improve infrastructure under NIP, which aims to provide world-class infrastructure and boost economic activities.

• Other Projects: Similar Greenfield projects include the Mumbai–Ahmedabad High-Speed Rail (Bullet Train) and Bengaluru–Chennai Expressway.

• Conclusion: The development of the Greenfield High-Speed Corridor between Meghalaya and Assam is a significant step towards enhancing connectivity and promoting economic growth in the northeastern region of India.

Q30. Answer: (b) High Court

The correct answer is High Court.

Key Points

• Control over district courts and subordinate judiciary: According to the Indian Constitution, the High Court exercises supervision and control over district courts and subordinate judiciary within its territorial jurisdiction.

• This includes administrative control, disciplinary measures, and ensuring efficient functioning of subordinate courts. Hence, the High Court is the correct authority.

• Article 227: It gives the High Court the power of superintendence over all courts and tribunals in its jurisdiction, except military courts. This ensures accountability and proper administration of justice.

• The High Court can also call for records and reports from subordinate courts, issue directions, or transfer cases as deemed necessary. Hence, the High Court has complete administrative control.

• While other institutions like the President of India, State Government, and Supreme Court play significant roles in governance, the High Court is specifically designated to oversee the functioning of district and subordinate courts. Hence, they are not directly responsible for this control.

Additional Information

• Article 227 of the Indian Constitution:

• Article 227 establishes the supervisory role of the High Court over all subordinate courts and tribunals within its jurisdiction.

• The High Court ensures the proper functioning, accountability, and adherence to judicial procedures in these courts. It can issue directions, transfer cases, and monitor their performance.

• Role of the High Court:

• The High Court has the authority to appoint, transfer, and take disciplinary action against subordinate judges. It ensures that the judiciary operates without bias and complies with established norms.

• The High Court plays a crucial role in maintaining the independence of the judiciary by safeguarding against external interference.

• Other Authorities and Their Roles:

• President of India: The President appoints judges to the High Court and Supreme Court but does not exercise direct control over district courts.

• State Government: The state government provides administrative support and resources to the judiciary but does not control subordinate courts.

• Supreme Court of India: As the apex court, the Supreme Court can hear appeals from High Courts, but it does not have supervisory control over district and subordinate courts.

Important Points

• Judicial Independence:

• The independence of judiciary is a cornerstone of democracy. The High Court ensures this by managing subordinate courts free from executive interference.

• The judiciary operates based on principles of fairness, impartiality, and adherence to the rule of law.

• Example of High Court Supervision:

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• For instance, the High Court can intervene in cases of judicial misconduct or inefficiency in subordinate courts.

• It can also direct lower courts to expedite pending cases or follow proper legal procedures.

Q31. Answer: (a) Arvind Shrivastava

The correct answer is Arvind Shrivastava.

Key Points

• Arvind Shrivastava was appointed as the Secretary of the Department of Revenue, Ministry of Finance in May 2025.

• This appointment is significant as the Secretary of Revenue is responsible for overseeing the functioning of revenue collection, taxation policies, and implementation of government strategies to enhance financial operations.

• The Department of Revenue operates under the Ministry of Finance, which plays a crucial role in managing the finances of the government of India, including taxation and revenue generation. Hence, option 1 is correct.

• Other options, such as Shankar Lal Kumawat, Smarak Swain, and Ajay Seth, are not accurate for this specific role in May 2025, as they hold different positions in government or other organizations.

• Hence, the correct answer is Arvind Shrivastava.

Additional Information

• Department of Revenue:

• The Department of Revenue is an integral part of the Ministry of Finance, tasked with the administration of direct and indirect taxes.

• It oversees the functioning of Central Board of Direct Taxes (CBDT) and Central Board of Indirect Taxes and Customs (CBIC), which are responsible for income tax, GST, customs duties, and other related taxes.

• Role of Secretary, Department of Revenue:

• The Secretary of Revenue is a senior bureaucratic position and works closely with other government officials to design and implement tax policies, ensure effective revenue collection, and streamline administrative processes.

• The Secretary also plays a critical role in coordinating with the Finance Minister and other ministries to achieve fiscal targets and economic reforms.

• Arvind Shrivastava:

• Arvind Shrivastava is a seasoned bureaucrat known for his expertise in public finance, administration, and policy-making.

• His appointment in May 2025 reflects the government's trust in his ability to manage complex revenue-related issues and contribute to the development of India’s financial framework.

Important Points

• Key Responsibilities of Department of Revenue:

• The Department is responsible for drafting tax laws, overseeing tax collection, and ensuring compliance with existing financial regulations.

• It also plays a vital role in combating tax evasion and black money, formulating strategies for economic growth through effective revenue measures.

• Significance of the Appointment:

• The appointment of a Secretary in the Department of Revenue is critical to ensuring the smooth functioning of the Ministry of Finance and achieving the fiscal goals of the government.

• This position requires strong administrative capabilities, expertise in economic policies, and the ability to handle challenges in revenue management effectively.

Q32. Answer: (d) Ayushman Bharat Health Infrastructure Mission and Ayushman Arogya Mandir

The correct answer is Ayushman Bharat Health Infrastructure Mission and Ayushman Arogya Mandir.

Key Points

• Ayushman Bharat Health Infrastructure Mission (ABHIM):

• Launched by the Government of India in October 2021, ABHIM focuses on strengthening public healthcare infrastructure across the country.

• The mission aims to build a robust system to respond to pandemics and health emergencies by developing critical care hospital blocks, diagnostic labs, and integrated public health labs. This statement is correct.

• Ayushman Arogya Mandir:

• The initiative is focused on promoting health and wellness through the establishment of wellness centers at a grassroots level. This statement is correct.

• These wellness centers are part of the vision to ensure preventive healthcare and awareness among citizens, thereby reducing the burden of diseases.

• The Director General of Health Services (DGHS) is the key administrative authority responsible for overseeing health-related

programs and initiatives in India. Their role is crucial in implementing these missions effectively. This statement is correct.

• The appointment of DGHS on 21 May 2025 is pivotal for ensuring successful execution and monitoring of both initiatives across the country. This statement is correct.

Additional Information

• Ayushman Bharat Health Infrastructure Mission (ABHIM):

• ABHIM was introduced to strengthen healthcare infrastructure and enhance access to quality healthcare services across India, especially in rural and underserved areas.

• It emphasizes better preparedness for future pandemics by establishing critical healthcare facilities, including integrated public health labs, critical care hospital blocks, and disease surveillance units.

• The mission also includes training health personnel and establishing robust surveillance systems.

• Ayushman Arogya Mandir:

• Ayushman Arogya Mandirs aim to act as wellness centers to promote preventive healthcare and awareness among rural and urban populations.

• These centers focus on spreading awareness about nutrition, cleanliness, and mental health while providing basic diagnostic services.

• Director General of Health Services (DGHS):

• The DGHS operates under the Ministry of Health and Family Welfare and plays a significant role in managing and implementing healthcare policies and initiatives.

• The DGHS is responsible for coordinating efforts between central and state governments to ensure the success of healthcare missions.

Important Points

• Implementation of ABHIM:

• The mission is designed to address gaps in health infrastructure and improve preparedness for health emergencies.

• It includes the establishment of 17,788 rural health and wellness centers and 11,024 urban health and wellness centers.

• Role of Ayushman Arogya Mandir:

• These centers aim to integrate traditional healthcare practices like Ayurveda and yoga with modern medical practices for holistic well-being.

• They are a step towards achieving universal healthcare and reducing the prevalence of lifestyle-related diseases.

• DGHS Leadership:

• The appointment of DGHS ensures proper monitoring and evaluation of these initiatives, ensuring they meet their goals effectively.

• The DGHS collaborates with other stakeholders to ensure the development and implementation of healthcare policies.

Q33. Answer: (d) 2000

The correct answer is 2000.

Key Points

• Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched by the Government of India in the year 2000. It aims to provide connectivity to unconnected rural habitations through all-weather roads.

• This scheme was developed as a part of the Government's poverty reduction strategy, recognizing the importance of rural roads in boosting economic growth and improving access to basic services.

• Rural connectivity under PMGSY ensures better access to markets, healthcare, education, and other essential services for people living in rural areas.

• The scheme is implemented by the Ministry of Rural Development and is funded by both the Central and State Governments. Hence, the correct answer is 2000.

Additional Information

• Features of PMGSY:

• The primary objective of PMGSY is to provide all-weather road connectivity to eligible unconnected habitations in rural areas. These are defined as those with a population of 500+ in plain areas and 250+ in hilly, tribal, or desert areas.

• The roads constructed under PMGSY are designed using modern engineering techniques to ensure durability and sustainability.

• PMGSY contributes significantly to poverty reduction by enhancing connectivity, reducing isolation, and promoting social and economic development.

• Implementation Details:

• The scheme is implemented by the Ministry of Rural Development in collaboration with state-level agencies.

• Funds for PMGSY are shared between the Central Government (60%) and the State Governments (40%).

• The scheme uses a geographic information system (GIS) for planning and monitoring purposes.

• Achievements:

• Since its inception, PMGSY has significantly improved rural infrastructure, contributing to better agricultural productivity and increased access to healthcare and education.

• The scheme has helped in the construction of thousands of kilometers of roads, connecting previously isolated regions.

Important Points

• Key Milestones:

• PMGSY was launched on December 25, 2000, under the leadership of the then Prime Minister Atal Bihari Vajpayee.

• The scheme is part of the broader effort to achieve inclusive development and bridge the urban-rural divide.

• Challenges:

• Implementation faces challenges such as land acquisition issues, delays in project completion, and maintenance concerns.

• Efforts are ongoing to address these challenges through better planning, use of technology, and increased funding.

Q34. Answer: (b) 1989

The correct answer is 1989.

Key Points

• The Basel Convention was adopted on 22 March 1989 as an international treaty designed to control the transboundary movements of hazardous wastes and their disposal.

• The primary aim of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous waste.

• The Convention establishes a framework for the global management of hazardous wastes, especially preventing their transfer from developed to developing countries. Hence, the correct answer is 1989.

• The treaty entered into force on 5 May 1992, following its ratification by a sufficient number of countries.

• The Basel Convention also emphasizes the need for reducing the generation of hazardous wastes and promoting environmentally sound management practices.

• It prohibits the export of hazardous waste to countries that lack the technical capacity or legal framework to handle such waste safely. This ensures proper disposal methods are followed globally.

Additional Information

• Key Objectives of the Basel Convention:

• To minimize the generation of hazardous waste as much as possible.

• To ensure that hazardous waste is disposed of in an environmentally sound manner and as close as possible to the source of generation.

• To reduce the movement of hazardous waste across borders, particularly from developed to developing nations.

• Scope of the Basel Convention:

• It applies to hazardous wastes, as defined by their properties (e.g., toxic, explosive, corrosive), and requires parties to notify and seek consent before exporting such waste.

• The Convention also covers other wastes, such as household waste, if they are contaminated with hazardous materials.

• Important Developments:

• In 1995, the Ban Amendment was added to the Basel Convention, prohibiting the export of hazardous waste from developed to developing countries for any reason.

• As of October 2023, 190 parties have ratified the Basel Convention, demonstrating its wide acceptance globally.

Important Points

• Countries' Responsibilities:

• Countries must implement domestic laws to regulate the generation, transportation, and disposal of hazardous waste.

• Countries are required to report their compliance with the Basel Convention and submit data on hazardous waste movements.

• Challenges:

• Despite the treaty, illegal trafficking of hazardous waste remains a concern, particularly in developing countries.

• Efforts are ongoing to strengthen enforcement mechanisms and ensure better compliance globally.

Q35. Answer: (d) Majority of the total membership and two-thirds of members present and voting

The correct answer is Majority of the total membership and two-thirds of members present and voting.

Key Points

• Constitutional Amendment Bills are governed by the procedure prescribed under Article 368 of the Indian Constitution.

• To pass a Constitutional Amendment Bill, a special majority is required. This refers to a majority of the total membership of the House and a two-thirds majority of members present and voting.

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• This special majority ensures that amendments to the Constitution are passed with significant support, making the process rigorous and reflective of widespread consensus. Hence, option 4 is correct.

• Statements like a simple majority or a two-thirds majority of one House alone are incorrect, as the Constitution requires a more stringent procedure for amendments. Hence, options 1, 2, and 3 are incorrect.

• The requirement of a unanimous vote is impractical and not prescribed for any Constitutional amendment. Hence, option 3 is incorrect.

• Thus, the correct answer is option 4.

Additional Information

• Article 368 of the Constitution:

• Article 368 provides the procedure for amending the Constitution. There are two types of amendments: by a special majority and by a special majority with ratification by half of the states.

• It ensures a balance between flexibility and rigidity, safeguarding the Constitution's sanctity while allowing scope for changes.

• Special Majority:

• Special majority refers to two-thirds of members present and voting and a majority of the total membership of the House.

• This provision ensures that amendments are passed with a significant consensus among lawmakers.

• Types of Constitutional Amendments:

• Amendments requiring a special majority: These amendments are passed solely by Parliament through a special majority.

• Amendments requiring ratification: Some amendments require approval by at least half of the state legislatures in addition to a special majority in Parliament.

• Examples:

• 73rd and 74th Constitutional Amendments: Introduced provisions for Panchayati Raj Institutions and urban local bodies, passed with a special majority and ratification by states.

• Goods and Services Tax (GST) Amendment: Required ratification by states as it altered the federal structure.

Important Points

• Key Legal Provisions:

• The procedure for amending the Constitution is outlined under Part XX of the Indian Constitution.

• Amendments cannot be made arbitrarily and require a significant consensus among lawmakers, ensuring democratic process and representation.

• Impact of Constitutional Amendments:

• Constitutional amendments play a vital role in adapting the Constitution to changing socio-economic and political realities.

• They have been used to introduce key reforms, such as reservations, fundamental rights expansions, and structural changes like GST.

Q36. Answer: (a) Jaipur

The correct answer is Jaipur.

Key Points

• North Western Railway Zone: The North Western Railway zone is one of the 18 railway zones in India, established to cater to the operational requirements of the Indian Railways.

• The headquarters of the North Western Railway zone is located in Jaipur, Rajasthan. This is a significant administrative center for managing railway operations in the region.

• The zone was created on October 1, 2002, as part of the Indian Railways' initiative to improve efficiency and decentralize operations. Hence, Jaipur is the correct answer.

• Coverage Area: The North Western Railway zone covers parts of Rajasthan, Gujarat, Haryana, and Punjab. It manages a vast network of railway lines that facilitate passenger and freight movement.

• It includes major divisions such as Jaipur, Ajmer, Bikaner, and Jodhpur. These divisions are strategically located to ensure smooth railway operations in the northern and western parts of India.

• Role in Tourism: Jaipur, known as the Pink City, is a prominent tourist destination, and the headquarters' location here helps manage connectivity to other tourist hubs like Jodhpur and Udaipur.

• The zone plays a crucial role in facilitating economic activities, including the movement of goods and agricultural produce within and outside Rajasthan. Thus, the importance of Jaipur as the headquarters is undeniable.

• Hence, the correct answer is Jaipur.

Additional Information

• Indian Railways:

• Indian Railways is one of the largest railway networks in the world, comprising 18 zones. It plays a critical role in the transportation of people and goods across the country.

• The zones are divided based on geographical regions to ensure efficient management and operations.

• About Jaipur:

• Jaipur is the capital city of Rajasthan. It is globally recognized for its rich cultural heritage, architectural marvels, and vibrant markets.

• The city is strategically located in northern India, making it an ideal location for the headquarters of the North Western Railway zone.

• Tourism Hub: Jaipur attracts tourists from all over the world due to landmarks like the Hawa Mahal, Amber Fort, and City Palace.

• Other Railway Zones:

• Hubli: Headquarters of South Western Railway Zone, serving Karnataka and parts of Andhra Pradesh.

• New Delhi: Headquarters of Northern Railway Zone, which is one of the largest zones in terms of network coverage.

• Hajipur: Headquarters of East Central Railway Zone, located in Bihar.

Important Points

• Division of Indian Railways:

• Indian Railways is divided into zones and each zone is further divided into divisions for better management.

• Each zone is headed by a General Manager, while divisions are managed by Divisional Railway Managers (DRMs).

• Historical Context:

• The North Western Railway zone was established on October 1, 2002, as part of the reorganization of zones within Indian Railways.

• Rajasthan, being centrally located in northern India, has been pivotal in rail connectivity, making Jaipur an ideal choice as the headquarters.

Q37. Answer: (c) Tropical

The correct answer is Tropical Zone.

Key Points

• The Tropical Zone, located between the Tropic of Cancer (23.5°N) and the Tropic of Capricorn (23.5°S), is the region that receives the vertical rays of the Sun throughout the year.

• The Sun's rays fall directly over this region during different times of the year due to the Earth's axial tilt and its revolution around the Sun.

• This phenomenon creates warm temperatures and leads to the formation of a tropical climate characterized by high temperatures and abundant rainfall. Hence, the Tropical Zone receives vertical rays of the Sun throughout the year.

• Regions within the Tropical Zone include parts of South America, Africa, Southeast Asia, and the Indian subcontinent. These areas experience phenomena like the equatorial climate and monsoons.

• Other zones, such as the Frigid Zone, Temperate Zone, and Polar Zone, do not receive vertical rays of the Sun due to their geographical positioning and the Sun's inclination.

• The Frigid Zone experiences extreme cold due to the Sun's rays falling at a very low angle. Similarly, the Temperate Zone receives oblique rays, leading to moderate climates.

• Hence, the correct answer is Tropical Zone.

Additional Information

• Zones of Earth:

• Earth is divided into different climatic zones based on the angle at which sunlight strikes the surface. The primary zones are the Tropical Zone, Temperate Zone, Frigid Zone, and Polar Zone.

• Tropical Zone: Extends from 23.5° north latitude to 23.5° south latitude. It experiences direct sunlight throughout the year and has a warm climate. Regions include the Amazon rainforest, the Congo basin, and Southeast Asia.

• Temperate Zone: Found between the Tropics and Polar regions, this zone experiences moderate temperatures. Examples include much of Europe, the United States, and southern parts of South America.

• Frigid Zone: Located near the poles, this zone experiences cold climates and low Sun angles, such as parts of Canada, Greenland, and Antarctica.

• Polar Zone: Found beyond 66.5° latitude (Arctic and Antarctic Circles), it experiences extreme cold and long periods of sunlight or darkness depending on the season.

• Phenomena in the Tropical Zone:

• The Intertropical Convergence Zone (ITCZ) is a belt of low pressure that encircles Earth near the equator. It results in heavy rainfall and tropical storms.

• The Tropical Zone is also home to major ecosystems such as rainforests, which support high biodiversity.

• Impact on Climate:

• The direct sunlight in the Tropical Zone results in higher temperatures, which influence weather patterns globally.

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• Regions here often experience monsoons due to differential heating and cooling of land and water.

Important Points

• Characteristics of Climatic Zones:

• Tropical Zone: Warm temperatures, abundant rainfall, and high biodiversity. Examples include the Amazon Rainforest and the Congo Basin.

• Temperate Zone: Moderate climates with distinct seasons. Examples include much of Europe and North America.

• Frigid Zone: Extremely cold climates with limited biodiversity. Examples include the Arctic and Antarctica.

• Polar Zone: Characterized by low temperatures, ice caps, and long periods of sunlight or darkness. Examples include Greenland and the North Pole.

• Sunlight and Earth's Zones:

• The amount of sunlight received by each zone determines its temperature and climate. The Tropical Zone, receiving direct sunlight, has the most consistent and warm temperatures.

• Other zones receive sunlight at oblique angles, leading to cooler temperatures and varied climates.

Q38. Answer: (b) Mizoram

The correct answer is Mizoram.

Key Points

• Mizoram achieved full literacy in 2025, making it the first Indian state to reach this milestone, as reported in the PLFS Annual Report (July 2023–June 2024).

• The state's commitment to education, supported by effective government policies, community participation, and the use of modern technology, contributed to its exceptional performance in literacy.

• Literacy campaigns in Mizoram focused on primary education, adult literacy, and inclusion of marginalized communities, ensuring equitable access to education.

• The state also emphasized the importance of mother tongue-based education, which played a significant role in achieving high literacy rates among its indigenous population.

• The PLFS Annual Report serves as a comprehensive indicator of various socio-economic metrics, including literacy rates, employment data, and other developmental statistics. Hence, this report confirms Mizoram's achievement.

Additional Information

• About Mizoram:

• Located in the northeastern part of India, Mizoram is known for its lush green landscapes and vibrant culture.

• The state has a population of approximately 1.1 million (2021 Census) and a literacy rate that exceeded 95% even before achieving full literacy.

• PLFS Annual Report:

• The Periodic Labour Force Survey (PLFS) is conducted by the National Statistical Office (NSO), under the Ministry of Statistics and Programme Implementation in India.

• It collects data on various socio-economic parameters, including employment, unemployment, labour force participation rates, and literacy levels.

• The report for July 2023–June 2024 highlights Mizoram’s achievement and provides insights into the state’s social development initiatives.

• Characteristics of Other States:

• Sikkim: A small northeastern state with high literacy rates but has not achieved full literacy yet.

• Himachal Pradesh: Known for its mountainous terrain, this northern state has made significant progress in education but has not reached full literacy.

• Kerala: Often regarded as the most literate state in India, with a literacy rate of over 96%, but not the first to achieve 100% literacy by 2025 as per the PLFS report.

Important Points

• Government Initiatives:

• Mizoram implemented several state-sponsored programs, such as adult literacy campaigns, free education schemes, and community-driven efforts to improve literacy rates.

• Focus on inclusive education ensured that children from tribal and marginalized communities received access to quality education.

• Role of Community:

• The active involvement of local communities and non-governmental organizations played a crucial role in Mizoram’s achievement.

• Use of local dialects and culture in educational content helped bridge the gap in education accessibility.

Q39. Answer: (c) Andhra Pradesh

The correct answer is Andhra Pradesh.

Key Points

• Andhra Pradesh was the first state in India to be formed on a linguistic basis after extensive public agitation and demands.

• The movement for a separate state for Telugu-speaking people gained momentum after the death of Potti Sriramulu, a freedom fighter who died during a hunger strike in 1952.

• Following his death, there were widespread protests and public unrest, leading to the creation of Andhra Pradesh in 1953. Hence, Andhra Pradesh was the first state to be formed on linguistic grounds.

• The formation of Andhra Pradesh set a precedent for the linguistic reorganization of states in India, which culminated in the States Reorganization Act of 1956.

• Telangana, although a Telugu-speaking region, was not formed as a separate state until 2014, when it was bifurcated from Andhra Pradesh. Hence, Telangana is not the correct answer.

• Kerala was formed in 1956 under the States Reorganization Act, but not due to linguistic agitation. Its creation was based on the integration of Malayalam-speaking regions. Hence, Kerala is not the correct answer.

• Tamil Nadu, originally known as Madras State, was reorganized and renamed in 1969. Its formation was not the result of linguistic protests. Hence, Tamil Nadu is not the correct answer.

• The creation of Andhra Pradesh marked a significant moment in Indian history, emphasizing the importance of linguistic and cultural identity. Hence, the correct answer is Andhra Pradesh.

Additional Information

• Potti Sriramulu:

• Potti Sriramulu was a freedom fighter and Gandhian who played a crucial role in the formation of Andhra Pradesh.

• He undertook a fast-unto-death demanding a separate state for Telugu-speaking people. His death on December 15, 1952, sparked massive protests.

• Formation of Andhra Pradesh:

• Andhra Pradesh was officially formed on October 1, 1953, with Kurnool as its capital.

• It was the first state in post-independent India to be created based on linguistic lines.

• States Reorganization Act, 1956:

• This act reorganized states on linguistic grounds across India, following the recommendations of the States Reorganization Commission.

• The act led to the formation of states like Karnataka, Kerala, and Maharashtra.

• Telangana Formation:

• Telangana was formed as a separate state on June 2, 2014, after prolonged agitation and political discussions.

• It was carved out of Andhra Pradesh, fulfilling the demand for a separate Telugu-speaking state.

Important Points

• Role of Linguistic Identity:

• The formation of Andhra Pradesh was driven by the recognition of linguistic identity as a basis for state reorganization.

• This concept was later extended to other states, ensuring administrative efficiency and cultural preservation.

• Precedents in State Formation:

• 1956: States Reorganization Act created several states based on linguistic criteria.

• 2000: The formation of Uttarakhand, Jharkhand, and Chhattisgarh reflected socio-economic and cultural considerations.

• 2014: The creation of Telangana emphasized the importance of regional aspirations.

Q40. Answer: (c) Group 1

The correct answer is Group 1.

Key Points

• Hydrogen belongs to Group 1 of the Periodic Table, which is also known as the Alkali Metals group.

• Hydrogen is placed in Group 1 because it has a single electron in its outermost shell, similar to other elements in the group like lithium, sodium, and potassium.

• Although hydrogen is a non-metal, its electronic configuration resembles that of Group 1 elements. It has an atomic number of 1, making its electronic configuration $1s^1$.

• Hydrogen can lose one electron to form a positive ion (H^+), similar to alkali metals which form positive ions like Na^+ or K^+. Hence, hydrogen is placed in Group 1.

• Hydrogen exhibits properties similar to alkali metals, such as the ability to form ionic compounds with non-metals, further supporting its placement in Group 1.

• However, hydrogen also shares similarities with Group 17 elements (halogens) because it can gain an electron to form H^-, but its primary placement remains in Group 1. Hence, hydrogen's placement in Group 1 is correct.

Additional Information

• Characteristics of Group 1 Elements:

• Group 1 consists of alkali metals like lithium, sodium, potassium, rubidium, cesium, and francium.

• All elements in Group 1 have one electron in their outermost shell, which makes them highly reactive.

• They tend to lose their outer electron to form unipositive ions (e.g., Na^+, K^+).

• Group 1 elements form ionic compounds with non-metals and are known for their low ionization energies.

• Properties of Hydrogen:

• Hydrogen is the lightest element with an atomic number of 1.

• It has a single electron and an electronic configuration of $1s^1$.

• Hydrogen is unique because it exhibits properties of both metals and non-metals.

• It can form both ionic and covalent compounds.

• Hydrogen is used in industries for applications like fuel cells, ammonia synthesis, and hydrogenation of oils.

• Comparison with Group 17 Elements:

• Group 17 elements are known as halogens and consist of fluorine, chlorine, bromine, iodine, and astatine.

• Hydrogen shares some similarities with halogens because it can gain an electron to form an anion (H^-).

• However, unlike halogens, hydrogen predominantly loses its electron to form H^+, aligning it more with Group 1 elements.

Important Points

• Hydrogen's Unique Position:

• Hydrogen is not classified as an alkali metal but shares several properties with them.

• Its placement in Group 1 is based on its atomic structure and chemical behavior.

• Unlike alkali metals, hydrogen exists as a diatomic gas (H2) under standard conditions.

• Industrial Applications of Hydrogen:

• Ammonia production: Used in the Haber process to synthesize ammonia for fertilizers.

• Fuel: Hydrogen is used in fuel cells to generate electricity and is considered a clean energy source.

• Rocket fuel: Liquid hydrogen is used as a propellant in space exploration.

Q41. Answer: (b) 11:55 a.m

Shortcut Trick

Let total distance = LCM(7, 5) = 35 units.

Speed of A = 35 ÷ 7 = 5 units/hr, Speed of B = 35 ÷ 5 = 7 units/hr.

Train A travels alone for 2 hours (7:50 a.m. to 9:50 a.m.), covering 5 × 2 = 10 units.

Remaining distance = 35 − 10 = 25 units. Relative speed = 5 + 7 = 12 units/hr.

Time to meet = 25 ÷ 12 hours = 2 hours 5 minutes.

Meeting time = 9:50 a.m. + 2 hours 5 minutes = 11:55 a.m.

Therefore The correct answer is 11:55 a.m.

Alternate Method

M

N

P

10 units

25 units

Train A →

Start: 7:50 a.m.

End: 2:50 p.m.

9:50 a.m.

← Train B

Start: 9:50 a.m.

End: 2:50 p.m.

Total Distance = 35 units

Given:

=> Train A travel time = 7:50 a.m. to 2:50 p.m. = 7 hours.

=> Train B travel time = 9:50 a.m. to 2:50 p.m. = 5 hours.

Calculations:

=> Let the total distance between M and N be the LCM of 7 and 5 = 35 km.

=> Speed of Train A = Distance ÷ Time = 35 ÷ 7 = 5 km/hr.

=> Speed of Train B = Distance ÷ Time = 35 ÷ 5 = 7 km/hr.

=> Distance travelled by Train A in 2 hours (from 7:50 a.m. to 9:50 a.m.) = Speed × Time = 5 × 2 = 10 km.

=> Remaining distance = 35 − 10 = 25 km.

=> Relative speed of both trains when moving towards each other = 5 + 7 = 12 km/hr.

=> Time taken to meet after 9:50 a.m. = Remaining distance ÷ Relative speed

=> Time taken = 25 ÷ 12 hours = 2 hours and (1/12 × 60) minutes = 2 hours 5 minutes.

=> Meeting time = 9:50 a.m. + 2 hours 5 minutes = 11:55 a.m.

Therefore The correct answer is 11:55 a.m.

Additional Information

Relative Speed

When two bodies travel in opposite directions, their relative speed is the sum of their individual speeds: Relative Speed = S1 + S2.

Trains Crossing Each Other

When two trains of lengths L1 and L2 cross each other, the total distance covered is L1 + L2. Time taken = (L1 + L2) ÷ Relative Speed.

Average Speed

For different speeds over equal distances, Average Speed = (2 × S1 × S2) ÷ (S1 + S2).

Q42. Answer: (d) 11

Shortcut Trick

Divide the given number 4519 by 30 to find the remainder.

4519 ÷ 30 gives a quotient of 150 and a remainder of 19.

To make the number completely divisible by 30, the required number to be added = Divisor − Remainder.

Required number = 30 − 19 = 11.

Therefore The correct answer is 11.

Alternate Method

Given:

The dividend is 4519.

The divisor is 30.

Concept Used:

According to the division algorithm, Dividend = (Divisor × Quotient) + Remainder.

When a number is divided by a divisor D leaving a remainder R, the smallest number that needs to be added to make it completely divisible by D is given by (D − R).

Calculations:

=> Let's divide 4519 by 30.

=> We know that 30 × 150 = 4500.

=> 4519 = 4500 + 19

=> 4519 = (30 × 150) + 19

=> Here, the remainder (R) is 19.

=> The smallest number to be added = Divisor − Remainder

=> Number to be added = 30 − 19

=> Number to be added = 11

=> Verification: 4519 + 11 = 4530, which is perfectly divisible by 30 (4530 ÷ 30 = 151).

Therefore The correct answer is 11.

Additional Information

Divisibility Rule of 30

A number is divisible by 30 if it is divisible by both 3 and 10. This means the number must end in a 0, and the sum of its digits must be a multiple of 3.

Number to be Subtracted

If the question asked for the smallest number to be subtracted to make the sum completely divisible by the divisor, the answer would simply be the remainder itself (which is 19 in this case).

Euclid's Division Lemma

For any integer a and positive integer b, there exist unique integers q and r such that a = bq + r, where $0 \leq r < b$.

Q43. Answer: (d) 144

Shortcut Trick

Let the ratio of the two numbers be 5 : 1 (since the first is five times the second).

Let the numbers be 5a and a.

Product = $5a \times a = 5a^2 = 2880$

=> $a^2 = 576$ => a = 24

Sum of the ratio parts = 5 + 1 = 6

Sum of the numbers = 6a = 6 × 24 = 144

Therefore The correct answer is 144.

Alternate Method

y

2nd No.

x = 5y

1st No.

Sum = x + y = 6y

Product = 5y × y = 2880

Given:

Product of two positive numbers = 2880

First number (x) = 5 × Second number (y)

Formula Used:

Product = x × y

Sum = x + y

Calculations:

=> x × y = 2880

Substitute x = 5y in the product equation:

=> (5y) × y = 2880

=> $5y^2 = 2880$

=> $y^2 = 2880 \div 5$

=> $y^2 = 576$

Since the numbers are positive, take the positive square root:

=> $y = \sqrt{576} = 24$

Now, calculate the first number (x):

=> x = 5 × 24 = 120

Calculate the sum of the two numbers:

=> Sum = x + y = 120 + 24 = 144

Therefore The correct answer is 144.

Additional Information

Ratio Multiplier Rule

When solving problems involving the product of ratios, always attach a variable (like a or k) to the parts. The product of a ratio like a : b is $(a \times b \times k^2)$, not just $(a \times b \times k)$.

Sum and Product Relationship

A useful algebraic identity connecting sum, difference, and product is: $(x + y)^2 = (x - y)^2 + 4xy$. This helps quickly jump between values when two of the three variables are known.

Perfect Squares

Memorizing perfect squares up to 30 speeds up calculation significantly in banking and aptitude exams. For instance, knowing instantly that $24^2 = 576$ skips the need for long division or prime factorization.

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Q44. Answer: (b) 14%

Shortcut Trick

When the overall percentage of a group matches the percentage of one of its sub-groups (males), the other sub-group (females) must have the exact same percentage.

Let the female literacy rate be x%.

14% of Total = 14% of Males + x% of Females

14% of (Males + Females) = 14% of Males + x% of Females => x = 14%

Therefore The correct answer is 14%.

Alternate Method

Given:

Total population = 351000

Number of males = 164000

Overall literacy rate = 14%

Male literacy rate = 14%

Total Population: 351,000

14% Literate

Males: 164,000

14% Literate

Females: 187,000

?% Literate

Literate Females = Total Literate − Literate Males

Calculations:

=> Number of females = Total population − Number of males

=> Number of females = 351000 − 164000 = 187000

=> Total literate population = 14% of 351000 = (14 ÷ 100) × 351000 = 49140

=> Literate males = 14% of 164000 = (14 ÷ 100) × 164000 = 22960

=> Literate females = Total literate − Literate males

=> Literate females = 49140 − 22960 = 26180

=> Percentage of literate females = (Literate females ÷ Total females) × 100

=> Percentage of literate females = (26180 ÷ 187000) × 100 = 14%

Therefore The correct answer is 14%.

Additional Information

Weighted Average Formula

When a group is divided into multiple parts, the overall average is calculated as: A_w = (n1A1 + n2A2) ÷ (n1 + n2)

Alligation Method

It is a quick method used to determine the ratio in which two components are combined to form a mixture: (Quantity 1 ÷ Quantity 2) = (A2 − A_w) ÷ (A_w − A1)

Base Independence

If two distinct parts possess the exact same percentage value (e.g., 14%), the combined percentage will also remain unchanged at that value (14%), completely irrespective of the absolute numbers in each group.

Q45. Answer: (c) 6 and 36

Shortcut Trick

Product of the two numbers = HCF × LCM = 6 × 36 = 216.

Check the options to find the pair with a product of 216 and a difference of 30.

12 × 42 = 504 | 24 × 54 = 1296 | 18 × 48 = 864

Option 3 gives 6 × 36 = 216 and a difference of 36 − 6 = 30.

Therefore The correct answer is 6 and 36.

Alternate Method

Given:

HCF = 6

LCM = 36

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Difference = 30
Formula Used:
Numbers = HCF × x and HCF × y (where x and y are co-prime)
Calculations:
=> Let the two numbers be 6x and 6y (where x > y).
=> LCM = 6xy = 36
=> xy = 6
=> Given difference = 6x − 6y = 30
=> x − y = 5
=> The only co-prime factors of 6 with a difference of 5 are 6 and 1.
=> So, x = 6 and y = 1.
=> The numbers are 6 × 6 = 36 and 6 × 1 = 6.
Therefore The correct answer is 6 and 36.
Additional Information
Product Rule of HCF and LCM
For any two numbers A and B, the product of the numbers is equal to the product of their HCF and LCM: A × B = HCF × LCM.
Co-prime Factors Rule
If the HCF of two numbers is H, they can be represented as Hx and Hy, where x and y are co-prime integers.
LCM of Hx and Hy
The LCM of two numbers represented as Hx and Hy is given by the formula: LCM = H × x × y.

Q46. Answer: (c) 9,900

Shortcut Trick
When Simple Interest and time are identical, the ratio of Principals is inversely proportional to their Rates.
=> P1 : P2 = R2 : R1 = 9 : 10
=> Total investment ratio parts = 9 + 10 = 19 parts ≡ Rs. 20,900
=> 1 part = 20,900 ÷ 19 = Rs. 1,100
=> Sum invested at 10% (P1) = 9 parts = 9 × 1,100 = Rs. 9,900
Therefore The correct answer is Rs. 9,900.
Alternate Method
Given:
Total invested sum = Rs. 20,900
Rate for 1st part (R1) = 10% and Rate for 2nd part (R2) = 9%
Time (T) = 5 years for both parts.
Simple interest earned from both parts is equal (SI1 = SI2).
Formula Used:
Simple Interest (SI) = (P × R × T) ÷ 100
Total Sum = Rs. 20,900
Part 1 (P1)
10% for 5 years
Part 2 (P2)
9% for 5 years
SI1 = SI2
Calculations:
=> Let the sum invested at 10% be P1 and at 9% be P2.
=> P1 + P2 = 20,900
Since the simple interest earned from both parts is equal:
=> (P1 × 10 × 5) ÷ 100 = (P2 × 9 × 5) ÷ 100
=> 50 × P1 = 45 × P2
=> 10 × P1 = 9 × P2
=> P1 / P2 = 9 / 10
=> Ratio of sums invested (P1 : P2) = 9 : 10

=> Total ratio parts = 9 + 10 = 19

=> 19 parts = Rs. 20,900

=> 1 part = 20,900 ÷ 19 = Rs. 1,100

We need the sum invested at 10% (P1), which corresponds to 9 parts.

=> P1 = 9 × 1,100 = Rs. 9,900

Therefore The correct answer is Rs. 9,900.

Additional Information

Equal Simple Interests Rule

If parts of a sum are invested such that their simple interests are equal, the ratio of the invested parts is P1 : P2 : P3 = 1/(R1×T1) : 1/(R2×T2) : 1/(R3×T3).

Equal Final Amounts Rule

If parts are invested such that their final return amounts (Principal + SI) are equal, the principal ratio becomes P1 : P2 : P3 = 1/(100 + R1×T1) : 1/(100 + R2×T2) : 1/(100 + R3×T3).

Difference Between SI and CI

For 2 years, the difference between Compound Interest (CI) and Simple Interest (SI) on a certain sum is calculated directly by the formula D = P × (R/100)².

Q47. Answer: (b) −122x + 110

Shortcut Trick

Solve the components mentally by separating the variables and constants.

x^2 terms: 3 × (4/3) − 4 = 4 − 4 = 0

x terms: 3 × (−30) − 4 × 8 = −90 − 32 = −122

Constant terms: 3 × 18 − 4 × (−14) = 54 + 56 = 110

Combine all parts: −122x + 110

Therefore The correct answer is −122x + 110.

Alternate Method

Given:

Expression: $3((4/3)x^2 - 30x + 18) - 4(x^2 + 8x - 14)$

Calculation:

=> Distribute 3 into the first bracket:

=> $3 \times (4/3)x^2 - 3 \times 30x + 3 \times 18 = 4x^2 - 90x + 54$

=> Distribute −4 into the second bracket:

=> $-4 \times x^2 - 4 \times 8x - 4 \times (-14) = -4x^2 - 32x + 56$

=> Combine both expanded expressions:

=> $(4x^2 - 90x + 54) + (-4x^2 - 32x + 56)$

=> Group the like terms together:

=> $(4 - 4)x^2 + (-90 - 32)x + (54 + 56)$

=> $0x^2 - 122x + 110$

=> $-122x + 110$

Therefore The correct answer is −122x + 110.

Additional Information

BODMAS Rule

It specifies the order of operations: Brackets, Orders, Division/Multiplication, Addition/Subtraction. Always solve the expressions inside the brackets first.

Distributive Property

Multiplication distributes over addition and subtraction: a(b ± c) = ab ± ac. This removes the brackets and makes simplification easier.

Like Terms Combination

Only terms with identical variables and powers can be added or subtracted (e.g., ax^2 and bx^2). Different variable terms remain separate.

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Q48. Answer: (a) 40 : 51

Shortcut Trick

Convert the ratios to approximate percentages for a quick comparison:

40 : 51 → 40 ÷ 51 ≈ 40 ÷ 50 = 80%

44 : 74 → 44 ÷ 74 ≈ 44 ÷ 75 ≈ 58.6%

42 : 70 → 42 ÷ 70 = 60%

22 : 76 → 22 ÷ 76 ≈ 22 ÷ 75 ≈ 29.3%

Therefore The correct answer is 40 : 51.

Alternate Method

Given:

Ratios: 40 : 51, 44 : 74, 42 : 70, 22 : 76

Method Used:

Convert each ratio into a decimal value by dividing the antecedent (first term) by the consequent (second term).

40 : 51

44 : 74

42 : 70

22 : 76

~78.4%

~59.4%

60.0%

~28.9%

Comparison of Ratio Percentages

Calculations:

=> 40 ÷ 51 ≈ 0.784

=> 44 ÷ 74 ≈ 0.594

=> 42 ÷ 70 = 0.600

=> 22 ÷ 76 ≈ 0.289

=> Comparing the decimal values: 0.784 > 0.600 > 0.594 > 0.289

=> The greatest decimal value is 0.784, which matches the ratio 40 : 51.

Therefore The correct answer is 40 : 51.

Additional Information

Cross-Multiplication Method

To rapidly compare two fractions a/b and c/d without decimals, simply multiply diagonally. If a × d > b × c, then the fraction a/b is greater.

Percentage Conversion

Any fraction can be efficiently analyzed by multiplying it by 100 to get a percentage, creating an easily comparable base of 100 for all fractions.

Decimal Approximation

In competitive exams, slightly adjusting the denominator to a nearby round number (like changing 51 to 50) saves crucial time while maintaining relative accuracy.

Q49. Answer: (b) 200/7% profit

Shortcut Trick

Total CP = Rs. 456 + Rs. 20 = Rs. 476

Total SP = Rs. 612

Profit = Rs. 612 − Rs. 476 = Rs. 136

Profit % = (136 ÷ 476) × 100 = 200/7%

Therefore The correct answer is 200/7% profit.

Alternate Method

Total CP

Rs. 476

Selling Price

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Rs. 612
Profit: Rs. 136
Base CP: Rs. 456
• Decor: Rs. 20
Profit % = (136 ÷ 476) × 100 = 200/7%
Given:
Base Cost Price (CP) = Rs. 456
Overhead expenses (Decoration) = Rs. 20
Selling Price (SP) = Rs. 612
Formula Used:
Total CP = Base CP + Overhead expenses
Profit = SP − Total CP
Profit % = (Profit ÷ Total CP) × 100
Calculation:
=> Total CP = 456 + 20 = 476
=> Profit = 612 − 476 = 136
=> Profit % = (136 ÷ 476) × 100
=> Profit % = (2 ÷ 7) × 100 = 200/7%
Therefore The correct answer is 200/7% profit.
Additional Information
Marked Price & Discount
Discount is always calculated on the Marked Price (MP). Formula: SP = MP − Discount, or SP = MP × (100 − D%) ÷ 100.
Successive Discounts
When two discounts a% and b% are given, the equivalent single discount is [a + b − (a × b) ÷ 100]%.
Dishonest Dealer
If a dealer sells goods at CP but uses a false weight, Profit % = (Error ÷ True Value − Error) × 100.

Q50. Answer: (a) Rs. 28,275

Shortcut Trick
Let the Principal sum be 100%.
Interest for the 1st year = 20%
Interest for the 2nd year = 20% + (20% of 20%) = 20% + 4% = 24%
Given that 24% of the sum = Rs. 6,786
Sum (100%) = (6786 ÷ 24) × 100 = 282.75 × 100 = Rs. 28,275
Therefore The correct answer is Rs. 28,275.
Alternate Method
Given:
Interest earned during the 2nd year = Rs. 6,786
Rate of interest (R) = 20% per annum
Formula Used:
Amount after 1st year (A1) = P × (1 + R/100)
Compound Interest for the 2nd year = A1 × (R/100)
Year 0 Year 1 Year 2 P 1.2 P 1.44 P 1st Yr CI = 0.2P 2nd Yr CI = 0.24P 0.24 P = Rs. 6,786
Calculations:
=> Let the principal sum be P.
=> Amount after 1st year = P × (1 + 20/100) = 1.2P
=> Compound interest for 2nd year = 1.2P × (20/100) = 0.24P
=> Given, 0.24P = 6786
=> P = 6786 ÷ 0.24
=> P = 678600 ÷ 24
=> P = 28275
Therefore The correct answer is Rs. 28,275.

Additional Information

Compound Interest Formula

The total amount A after t years is given by A = P(1 + R/100)^t, where P is the principal and R is the rate of interest.

Effective Rate of Interest

For 2 years at a rate of R%, the effective compound interest rate is calculated as [R + R + (R×R)÷100]%.

Interest for the n^(th) Year

The compound interest for a specific n^(th) year is calculated by applying the interest rate directly on the total amount accumulated at the end of the (n−1)^(th) year.

Q51. Answer: (c) 3

Shortcut Trick

A number is completely divisible by 3 if the sum of its digits is a multiple of 3.

Sum of digits of 253118139 = 2 + 5 + 3 + 1 + 1 + 8 + 1 + 3 + 9 = 33.

Since 33 is exactly divisible by 3, the entire number is divisible by 3.

Therefore The correct answer is 3.

Alternate Method

Given:

The given number is 253118139.

Method Used:

We check the divisibility of the given number by testing each option using basic divisibility rules.

Calculations:

=> Divisibility by 12: A number must be divisible by both 3 and 4. For 4, the last two digits must be divisible by 4. Here, the last two digits form 39, which is not divisible by 4.

=> Divisibility by 5: A number is divisible by 5 only if its unit digit is 0 or 5. Here, the unit digit is 9, so it is not divisible by 5.

=> Divisibility by 3: A number is divisible by 3 if the sum of all its digits is divisible by 3.

=> Sum of digits = 2 + 5 + 3 + 1 + 1 + 8 + 1 + 3 + 9 = 33.

=> 33 ÷ 3 = 11. Since the sum is perfectly divisible by 3, the number is divisible by 3.

=> Divisibility by 8: A number is divisible by 8 if its last three digits form a number divisible by 8. Here, 139 is an odd number and cannot be divided by an even number like 8.

Therefore The correct answer is 3.

Additional Information

Divisibility Rule of 4 and 8

A number is divisible by 4 if the number formed by its last two digits is divisible by 4. It is divisible by 8 if the number formed by its last three digits is divisible by 8.

Divisibility Rule of 9

Similar to the rule of 3, a number is exactly divisible by 9 if the sum of all its digits is a multiple of 9.

Divisibility Rule of 11

A number is divisible by 11 if the difference between the sum of its digits at odd places and the sum of its digits at even places is either 0 or a multiple of 11.

Q52. Answer: (a) 94,472

Shortcut Trick

Let the cost price for A be 100 units.

Selling price to B at 60% loss = 100 − 60 = 40 units.

Selling price to C at 25% profit = 40 + (25% of 40) = 50 units.

Given that C purchased it for Rs. 47,236, we get 50 units = 47,236.

Cost price for A (100 units) = 47,236 × (100 ÷ 50) = 47,236 × 2 = 94,472.

Therefore The correct answer is Rs. 94,472.

Alternate Method

Given:

Loss percentage for A = 60%

Profit percentage for B = 25%

Cost price for C = Rs. 47,236

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CP of A

−60%

CP of B

+25%

CP of C

?

Rs. 47,236

Net Multiplier = 0.4 × 1.25 = 0.5

Formula Used:

CP of A × (100 − L%) ÷ 100 × (100 + P%) ÷ 100 = CP of C

Calculations:

=> CP of A × (100 − 60) ÷ 100 × (100 + 25) ÷ 100 = 47236

=> CP of A × 40 ÷ 100 × 125 ÷ 100 = 47236

=> CP of A × 2 ÷ 5 × 5 ÷ 4 = 47236

=> CP of A × 1 ÷ 2 = 47236

=> CP of A = 47236 × 2

=> CP of A = 94472

Therefore The correct answer is Rs. 94,472.

Additional Information

Successive Profit/Loss

When an item passes through multiple hands, the final price is calculated by multiplying the successive fractional factors: Final CP = Initial CP × (1 ± P1/100) × (1 ± P2/100).

Effective Percentage Change

The net percentage change for two successive changes x% and y% is given by the formula: Net % Change = x + y + (x × y) ÷ 100. (Use negative values for loss).

Fraction Equivalents

Converting percentages to fractions speeds up calculations. A loss of 60% leaves 2/5 of the value, and a profit of 25% makes the new value 5/4 of the previous value.

Q53. Answer: (a) 171

Shortcut Trick

The average of the first n even numbers is directly given by the formula (n + 1).

Here, the number of terms n = 170.

=> Average = 170 + 1 = 171

Therefore The correct answer is 171.

Alternate Method

Given:

Number of terms (n) = 170

The sequence of the first 170 even numbers is: 2, 4, 6, ..., 340

Formula Used:

Average of an Arithmetic Progression (A.P.) = (First term + Last term) ÷ 2

2

4

6

.....

340

Average = (2 + 340) ÷ 2 = 171

First 170 Even Numbers

Calculations:

=> First term (a) = 2

=> Last term (l) = 170 × 2 = 340

=> Average = (2 + 340) ÷ 2

=> Average = 342 ÷ 2

=> Average = 171

Therefore The correct answer is 171.

Additional Information

Average of first n natural numbers

The average of the first n natural numbers is calculated using the formula (n + 1) ÷ 2.

Average of first n odd numbers

The average of the first n consecutive odd numbers starting from 1 is exactly equal to n.

Average of an Arithmetic Progression

For any given sequence of numbers that maintains a constant difference between consecutive terms, the average is strictly derived by (First Term + Last Term) ÷ 2.

Q54. Answer: (d) Rs. 20,988

Shortcut Trick

Using the direct cover-up method for 4A = 9B = 3C:

Ratio A : B : C = (9 × 3) : (4 × 3) : (4 × 9) = 27 : 12 : 36 => 9 : 4 : 12

Total ratio parts = 9 + 4 + 12 = 25 parts.

A's Share = (9 ÷ 25) × 58300 = 9 × 2332 = 20988.

Therefore The correct answer is Rs. 20,988.

Alternate Method

Given:

Total amount = Rs. 58,300

Relation between shares: 4A = 9B = 3C

Total = 25 parts = Rs. 58,300

A (9 parts)

B (4)

C (12 parts)

A's Share = ?

Calculations:

=> Let 4A = 9B = 3C = k

=> A = k/4, B = k/9, C = k/3

=> Ratio of shares A : B : C = 1/4 : 1/9 : 1/3

=> LCM of denominators (4, 9, 3) is 36.

=> Multiply the ratio by 36 to remove fractions:

=> A : B : C = (36/4) : (36/9) : (36/3) = 9 : 4 : 12

=> Total ratio parts = 9 + 4 + 12 = 25 parts

=> 25 parts = 58,300

=> 1 part = 58,300 ÷ 25 = 2,332

=> Share of A = 9 parts = 9 × 2,332 = 20,988

Therefore The correct answer is Rs. 20,988.

Additional Information

Equality of Multiple Terms (Cover-up Method)

If aA = bB = cC, the ratio A : B : C can be found directly by multiplying the coefficients of the other terms: A = b × c, B = a × c, C = a × b.

Dividing in a Given Ratio

To divide a total amount T in the ratio a : b : c, the individual share is calculated as: Share = (Ratio part ÷ Sum of all ratio parts) × T.

Inverse Ratio

The inverse ratio of a : b is b : a. For three quantities a : b : c, the inverse ratio is (1/a) : (1/b) : (1/c), which simplifies to bc : ac : ab.

Q55. Answer: (d) Rs. 810

Shortcut Trick

If the discount is 10%, the selling price becomes 90% of the Marked Price.

Selling Price = 90% of 900
Selling Price = (90 ÷ 100) × 900
Selling Price = 810
Therefore The correct answer is Rs. 810.
Alternate Method
Given:
Marked Price (MP) = Rs. 900
Discount = 10%
Formula Used:
Selling Price (SP) = MP − Discount
Discount = (Discount % ÷ 100) × MP
Marked Price
Rs. 900
Selling Price
Rs. 810
− 10% Discount
Calculations:
=> Discount amount = 10% of 900
=> Discount amount = (10 ÷ 100) × 900
=> Discount amount = Rs. 90
=> Selling Price = 900 − 90
=> Selling Price = Rs. 810
Therefore The correct answer is Rs. 810.
Additional Information
Successive Discounts
When two discounts of a% and b% are given, the single equivalent discount is given by the formula: (a + b − ab ÷ 100)%.
Direct Relation Between MP and CP
Ratio of Marked Price to Cost Price can be directly found using: MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%).
Base Values for Profit and Discount
Profit or Loss is always calculated over the Cost Price (CP), whereas the Discount is always calculated over the Marked Price (MP).

Q56. Answer: (b) 50^(-39)

Shortcut Trick
Using the basic rules of exponents, we can solve this simplification in a single step.
When the base is the same, subtract exponents for division and add for multiplication.
=> 50^(−13) ÷ 50^(15) × 50^(−11)
=> 50^(−13 − 15 + (−11)) = 50^(−39)
Therefore The correct answer is 50^(−39).
Alternate Method
Given:
50^(−13) ÷ 50^(15) × 50^(−11)
Formula Used:
a^m ÷ aⁿ = a^(m − n)
a^m × aⁿ = a^(m + n)
Calculation:
According to the BODMAS rule, division and multiplication have the same priority. We evaluate them from left to right.
=> (50^(−13) ÷ 50^(15)) × 50^(−11)
=> 50^(−13 − 15) × 50^(−11)
=> 50^(−28) × 50^(−11)
=> 50^(−28 + (−11))
=> 50^(−39)

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Therefore The correct answer is 50^(−39).

Additional Information

Product Rule of Exponents

When multiplying two terms with the same base, you add their exponents: a^m × aⁿ = a^(m + n).

Quotient Rule of Exponents

When dividing two terms with the same base, you subtract the exponent of the divisor from the exponent of the dividend: a^m ÷ aⁿ = a^(m − n).

Power of a Power Rule

To raise a power to another power, multiply the exponents: (a^m)ⁿ = a^(m × n).

Negative Exponent Rule

A negative exponent indicates the reciprocal of the base raised to the positive exponent: a^(−m) = 1 ÷ a^m.

Q57. Answer: (d) 2300

Shortcut Trick

Let the original number be 100%.

When increased by 70%, the new value becomes 100% + 70% = 170%.

We are given that 170% corresponds to 3910.

1% = 3910 ÷ 170 = 23

Original number (100%) = 23 × 100 = 2300

Therefore The correct answer is 2300.

Alternate Method

Given:

A number when increased by 70% results in 3910.

Formula Used:

Final Value = Initial Value × (1 + Percentage Increase ÷ 100)

Original = 100%

• 70% Increase

x = ?

Total = 170% = 3910

100% = 2300

Calculations:

=> Let the number be x.

=> x + (70% of x) = 3910

=> x × (1 + 70 ÷ 100) = 3910

=> x × 1.70 = 3910

=> x = 3910 ÷ 1.70

=> x = 39100 ÷ 17

=> x = 2300

Therefore The correct answer is 2300.

Additional Information

Percentage Increase or Decrease

Percentage change is calculated as: (Difference ÷ Original Value) × 100.

Successive Percentage Change

When a number undergoes two successive changes of A% and B%, the net change is calculated using the formula: A + B + (A × B) ÷ 100.

Base Change Rule

If quantity A is R% more than quantity B, then B is [R ÷ (100 + R)] × 100% less than A.

Q58. Answer: (a) 24

Shortcut Trick

Simplify both given statements into linear equations for Mother (M) and Daughter (D):

First statement: 2M = 4D + 26 => M − 2D = 13

Second statement: M − 3D = 2

Subtracting the second equation from the first directly gives D = 11.

Substituting D = 11 into the second equation gives M = 33 + 2 = 35.

The difference in their ages is 35 − 11 = 24.

Therefore The correct answer is 24 years.

Alternate Method

Given:

Let the Mother's age be M and the Daughter's age be D.

Condition 1: 2 × M = 4 × D + 26

Condition 2: 3 × D = M − 2

Mother (M)Daughter (D)Eq 1: M - 2D = 13Eq 2: M - 3D = 2

Calculations:

=> From Condition 1, divide the entire equation by 2 to simplify:

=> M = 2D + 13

=> Substitute the value of M into Condition 2:

=> 3D = (2D + 13) − 2

=> 3D − 2D = 11

=> D = 11 years

=> Now, substitute D back into M = 2D + 13:

=> M = 2 × 11 + 13

=> M = 22 + 13 = 35 years

=> Required difference in their ages = M − D

=> 35 − 11 = 24 years

Therefore The correct answer is 24 years.

Additional Information

Ages and Linear Equations

Age problems are translated into linear equations by replacing phrases like 'times', 'more than', or 'less than' with multiplication, addition, and subtraction respectively.

Constant Age Difference

The absolute difference in age between any two individuals always remains constant across time. If person A is 24 years older than person B today, the age gap will always be 24 years regardless of future or past shifts.

Solving Simultaneous Equations

Linear equations with two unknown variables can be effectively resolved using the substitution method (expressing one variable in terms of the other) or the elimination method (adding/subtracting aligned equations to cancel out a variable).

Q59. Answer: (b) 42°

Shortcut Trick

In ΔABC, angle BCA = 180° − (93° + 18°) = 69°.

Due to BC || AD, alternate interior angle angle CAD = angle BCA = 69°.

In isosceles ΔACD (AC = CD), base angles are equal: angle ADC = angle CAD = 69°.

Thus, angle ACD = 180° − (69° + 69°) = 42°.

Therefore The correct answer is 42°.

Alternate Method

Given:

Trapezium ABCD with BC || AD

AC = CD

angle ABC = 18°, angle BAC = 93°

Formula Used:

Sum of angles in a triangle = 180°

Alternate interior angles for parallel lines are equal.

Calculations:

=> In ΔABC, the sum of angles is 180°.

=> angle BCA = 180° − (angle ABC + angle BAC)

=> angle BCA = 180° − (18° + 93°) = 180° − 111° = 69°

=> Since BC || AD and AC is a transversal line, the alternate interior angles are equal.

=> angle CAD = angle BCA = 69°

=> In ΔACD, it is given that AC = CD. Thus, the angles opposite to these sides are equal.

=> angle ADC = angle CAD = 69°

=> Taking ΔACD, the sum of angles is 180°.

=> angle ACD = 180° − (angle CAD + angle ADC)

=> angle ACD = 180° − (69° + 69°) = 180° − 138° = 42°

Therefore The correct answer is 42°.

Additional Information

Isosceles Triangle Properties

In an isosceles triangle, the angles opposite to the equal sides are always equal. This is known as the base angles theorem.

Parallel Lines & Transversals

When two parallel lines are intersected by a transversal, the alternate interior angles are equal, and the consecutive interior angles sum to 180°.

Angle Sum Property

The sum of all interior angles of a triangle is exactly 180°, regardless of the side lengths or triangle type.

Q60. Answer: (a) 9.56

Shortcut Trick

Substitute given values directly: (4^(0.72))^z = (4^(0.86))^8.

Equating powers of 4: 0.72 × z = 0.86 × 8.

=> 0.72z = 6.88.

=> z = 6.88 ÷ 0.72 = 688 ÷ 72 ≈ 9.555...

Therefore The correct answer is 9.56.

Alternate Method

Given:

x = 4^(0.72)

y = 4^(0.86)

x^z = y^8

Formula Used:

$(a^m)^n = a^{(mn)}$

If $a^m = a^n$, then m = n.

Calculations:

=> Substitute the values of x and y in the equation x^z = y^8.

=> (4^(0.72))^z = (4^(0.86))^8

=> 4^(0.72 × z) = 4^(0.86 × 8)

=> 4^(0.72z) = 4^(6.88)

Since the bases are equal, we can equate the exponents:

=> 0.72z = 6.88

=> z = 6.88 ÷ 0.72

=> z = 688 ÷ 72

=> z = 86 ÷ 9

=> z = 9.555...

Rounding off to two decimal places, we get z ≈ 9.56.

Therefore The correct answer is 9.56.

Additional Information

Laws of Exponents (Power of a Power)

When raising a power to another power, multiply the exponents: $(a^m)^n = a^{(mn)}$.

Equality of Exponents

If the bases on both sides of an equation are equal and strictly greater than 1, their exponents must also be equal: a^x = a^y => x = y.

Laws of Exponents (Multiplication & Division)

When multiplying terms with the same base, add their exponents: a^m × aⁿ = a^(m+n). When dividing, subtract the exponents: a^m ÷ aⁿ = a^(m−n).

Q61. Answer: (b) 51.8

Shortcut Trick

Let the assumed average be 50 kg.

Net deviation = (40 − 50) + (49 − 50) + (56 − 50) + (75 − 50) + (39 − 50)

Net deviation = −10 − 1 + 6 + 25 − 11 = +9

Average = Assumed average + (Net deviation ÷ Count)

Average = 50 + (9 ÷ 5) = 50 + 1.8 = 51.8 kg

Therefore The correct answer is 51.8 kg.

Alternate Method

Given:

Weights of the family members = 40 kg, 49 kg, 56 kg, 75 kg and 39 kg

Number of members (n) = 5

Formula Used:

Average = Sum of all observations ÷ Total number of observations

40 kg

49 kg

56 kg

75 kg

39 kg

Sum = 259 kg

Average = 51.8 kg

Calculations:

=> Total sum of weights = 40 + 49 + 56 + 75 + 39

=> Total sum of weights = 259 kg

=> Average weight = 259 ÷ 5

=> Average weight = 51.8 kg

Therefore The correct answer is 51.8 kg.

Additional Information

Combined Average

If two groups have sizes n1 and n2 with averages A1 and A2 respectively, the combined average is calculated as (n1 × A1 + n2 × A2) ÷ (n1 + n2).

Deviation Method

A highly efficient exam technique where an assumed average is chosen arbitrarily. The true average is then calculated as: True Average = Assumed Average + (Sum of Deviations ÷ Total Count). This method minimizes large calculations and saves time.

Impact of Addition or Subtraction

If every observation in a dataset is uniformly increased or decreased by a constant value 'k', the new average of the dataset also strictly increases or decreases by the exact same constant 'k'.

Q62. Answer: (c) Rs. 1,026

Shortcut Trick

Convert the percentage discounts into multiplying fractions: 10% = 1/10 and 5% = 1/20.

Multiplying factors after discount become: (1 − 1/10) = 9/10 and (1 − 1/20) = 19/20.

Selling Price (SP) = MP × 9/10 × 19/20

Selling Price = 1200 × 171/200 = 6 × 171 = 1026

Therefore The correct answer is Rs. 1,026.

Alternate Method

Given:

Marked Price (MP) of the bottle = Rs. 1,200

First discount (D1) = 10%

Second successive discount (D2) = 5%

Formula Used:

Final Selling Price (SP) = MP × [(100 − D1)/100] × [(100 − D2)/100]

−10%

−5%

Marked Price

Rs. 1200

1st SP

Rs. 1080

Final SP

Rs. 1026

Successive Discount Flow

Calculations:

=> SP = 1200 × [(100 − 10) / 100] × [(100 − 5) / 100]

=> SP = 1200 × (90 / 100) × (95 / 100)

=> SP = 1200 × 0.90 × 0.95

=> SP = 1080 × 0.95

=> SP = 1026

Therefore The correct answer is Rs. 1,026.

Additional Information

Single Equivalent Discount

When two successive discounts of a% and b% are offered, their single equivalent discount can be calculated directly using the formula: Equivalent Discount = (a + b − ab/100)%.

Successive Discount Mechanism

In a successive discount scheme, every subsequent discount is applied on the freshly reduced price after deducting the previous discount, rather than on the original Marked Price (MP).

Base Reference Rules

Discounts are universally calculated over the Marked Price (MP), whereas terms like Profit or Loss are always computed over the base Cost Price (CP).

Q63. Answer: (b) 39 cm

Shortcut Trick

In an equilateral triangle, all three sides are equal in length.

Perimeter = 3 × side

Perimeter = 3 × 13 = 39 cm

Therefore The correct answer is 39 cm.

Alternate Method

Given:

Side of the equilateral triangle (a) = 13 cm

A

B

C

13 cm

13 cm

13 cm

Formula Used:

Perimeter of a triangle = Sum of all its sides

Calculation:

=> Perimeter = a + a + a

=> Perimeter = 13 + 13 + 13

=> Perimeter = 39 cm

Therefore The correct answer is 39 cm.

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Additional Information

Area of Equilateral Triangle

The area is calculated using the formula: Area = (√3 ÷ 4) × a², where 'a' is the side of the triangle.

Height (Altitude) of Equilateral Triangle

The perpendicular distance from any vertex to the opposite side is given by: Height = (√3 ÷ 2) × a.

Inradius & Circumradius

The radius of the inscribed circle (Inradius) = a ÷ (2√3) and the radius of the circumscribed circle (Circumradius) = a ÷ √3.

Q64. Answer: (a) 45/4

Shortcut Trick

Total work = LCM(30, 18, 9) = 90 units.

Efficiency of Anjali = 90 ÷ 30 = 3 units/day.

Efficiency of (Anjali + Ayushi + Ankita) = 90 ÷ 9 = 10 units/day.

Efficiency of Ankita = 10 − (90 ÷ 18) = 10 − 5 = 5 units/day.

Time taken by Anjali and Ankita = 90 ÷ (3 + 5) = 90 ÷ 8 = 45/4 days.

Therefore The correct answer is 45/4 days.

Alternate Method

Given:

Time taken by Anjali = 30 days

Time taken by Anjali and Ayushi = 18 days

Time taken by Anjali, Ayushi and Ankita = 9 days

Formula Used:

Total Work = LCM of given days

Efficiency = Total Work ÷ Time

Calculation:

Person	Days	Total Work	Efficiency
Anjali	30	90	3
Anjali + Ayushi	18	5	
Anjali + Ayushi + Ankita	9	10	

=> Efficiency of Ankita = Efficiency of (Anjali + Ayushi + Ankita) − Efficiency of (Anjali + Ayushi)

=> Efficiency of Ankita = 10 − 5 = 5 units/day

=> Combined efficiency of Anjali and Ankita = 3 + 5 = 8 units/day

=> Time taken by Anjali and Ankita together = Total Work ÷ Combined Efficiency

=> Time taken = 90 ÷ 8 = 45/4 days

Therefore The correct answer is 45/4 days.

Additional Information

Pipes & Cisterns

Works identically to Time & Work. The inlet pipe performs positive work (+ efficiency), while the outlet pipe performs negative work (− efficiency).

Work & Wages

Wages are distributed in direct proportion to the actual amount of work done by each person. When all persons work for the same total time, wages are divided based on their ratio of efficiency.

Alternate Days Work

Always find the total work done in one complete cycle (e.g., 2 days if two people work alternately). Multiply cycles to reach closest to the total work, then calculate the time required for remaining work.

Q65. Answer: (a) 11101/129 days

Shortcut Trick

Total Work = LCM(19, 16, 5) = 19 × 16 × 5 = 1520 units

Efficiency of A = 1520 ÷ 19 = 80, Efficiency of B = 1520 ÷ 16 = 95

Combined Efficiency (A + B + C) = 1520 ÷ 5 = 304

Efficiency of C = 304 − (80 + 95) = 304 − 175 = 129 units/day

Time required for C = 1520 ÷ 129 = 11^(101)/129 days

Therefore The correct answer is 11^(101)/129 days.

Alternate Method

Given:

Time taken by A = 19 days

Time taken by B = 16 days

Time taken by A, B, and C together = 5 days

Formula Used:

Total Work = LCM of all individual days

Efficiency = Total Work ÷ Days

Person	Days	Total Work	Efficiency
A	19	1520	80
B	16	95	
A + B + C	5	304	

Calculations:

=> Efficiency of A + B = 80 + 95 = 175 units/day

=> Efficiency of C = (Efficiency of A + B + C) − (Efficiency of A + B)

=> Efficiency of C = 304 − 175 = 129 units/day

=> Time taken by C alone = Total Work ÷ Efficiency of C

=> Time taken by C alone = 1520 ÷ 129

=> Time taken by C alone = 11^(101)/129 days

Therefore The correct answer is 11^(101)/129 days.

Additional Information

Pipes & Cisterns

Inlet pipes have positive efficiency while outlet pipes (leaks) have negative efficiency. Total capacity = LCM of individual times.

Work & Wages

Wages are always distributed in the ratio of the total work done by each person. If they work for the exact same duration, wages are distributed directly in the ratio of their daily efficiencies.

Alternate Day Work

Find the total work done in a complete cycle (e.g., 2 days for 2 people) and multiply by the maximum possible integer before the remaining work is done individually.

Q66. Answer: (d) Rs. 256

Shortcut Trick

Simplified investment ratio of A : B : C = 63 : 35 : 42 = 9 : 5 : 6

Total profit ratio parts = 9 + 5 + 6 = 20 parts

20 parts = Rs. 5,120 => 1 part = 5120 ÷ 20 = Rs. 256

Difference between the profit share of C and B = 6 parts − 5 parts = 1 part

Therefore The correct answer is Rs. 256.

Alternate Method

Given:

Investment ratio of A, B, and C = 63 : 35 : 42

Total profit earned at the end of the year = Rs. 5,120

Formula Used:

Since the time period of investment is the same for all partners, Profit Ratio = Investment Ratio

Profit Distribution (Total = 20 parts = Rs. 5,120)

A = 9 parts

B = 5 parts

C = 6 parts

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Difference (C − B) = 6 − 5 = 1 part

1 part = 5120 ÷ 20 = Rs. 256

Calculation:

=> Simplifying the given investment ratio by dividing by 7:

=> A : B : C = 63 : 35 : 42 = 9 : 5 : 6

=> Let the profit share of A, B, and C be 9x, 5x, and 6x respectively.

=> Total profit = 9x + 5x + 6x = 20x

=> 20x = 5120

=> x = 5120 ÷ 20 = 256

=> Difference between the share of B and C = 6x − 5x = x

=> Difference = Rs. 256

Therefore The correct answer is Rs. 256.

Additional Information

Simple Partnership

If all partners invest their capital for the exact same time period, the final profit is distributed strictly in the ratio of their invested amounts.

Compound Partnership

If partners invest for different time periods, the profit ratio is calculated as the product of capital and time: (C1 × T1) : (C2 × T2).

Working vs Sleeping Partner

A working partner manages the business and receives a fixed salary or percentage of the profit beforehand, while a sleeping partner only receives a share based on their investment.

Q67. Answer: (c) 5

Shortcut Trick

The divisibility rule of 5 states that any number ending with a 0 or 5 is exactly divisible by 5.

The given number is 245015, and its unit digit is 5.

Hence, the number is exactly divisible by 5 without the need to check other complex options.

Therefore The correct answer is 5.

Alternate Method

Given:

Number = 245015

Options to check: 2, 15, 5, 11

Method Used:

We will verify the standard divisibility rules for each given option to find the exact divisor.

Calculations:

=> Checking divisibility by 2: The unit digit is 5 (which is an odd number). Thus, 245015 is not divisible by 2.

=> Checking divisibility by 15: For a number to be divisible by 15, it must be divisible by both 3 and 5. The sum of the digits = 2 + 4 + 5 + 0 + 1 + 5 = 17, which is not divisible by 3. Thus, 245015 is not divisible by 15.

=> Checking divisibility by 5: The unit digit is 5. Thus, 245015 is exactly divisible by 5.

=> Checking divisibility by 11: The difference between the sum of digits at odd positions (from right) and even positions = (5 + 0 + 4) − (1 + 5 + 2) = 9 − 8 = 1. Since 1 is neither 0 nor a multiple of 11, it is not divisible by 11.

Therefore The correct answer is 5.

Additional Information

Divisibility Rule of 3 and 9

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

Divisibility Rule of 4 and 8

A number is divisible by 4 if its last two digits form a number divisible by 4. It is divisible by 8 if the last three digits form a number divisible by 8.

Divisibility Rule of 6

A number is divisible by 6 if it satisfies the divisibility rules of both 2 (must be an even number) and 3 (sum of digits divisible by 3).

Divisibility Rule of 11

A number is divisible by 11 if the difference between the sum of its digits at odd places and the sum of its digits at even places is either 0 or a multiple of 11.

Q68. Answer: (b) 396

Shortcut Trick

Diameter of the largest circle in a rectangle = Breadth of the rectangle = 126 m.

Circumference = π × d

=> 22/7 × 126

=> 396 m

Therefore The correct answer is 396 m.

Alternate Method

Given:

Length of the rectangle = 226 m

Breadth of the rectangle = 126 m

226 m

126 m

d = 126 m

Formula Used:

Circumference of a circle = 2 × π × r

Calculations:

=> For the largest circle to be completely inside the rectangle, its diameter must be equal to the smaller side (breadth) of the rectangle.

=> Diameter of the circle (d) = 126 m

=> Radius (r) = d ÷ 2 = 126 ÷ 2 = 63 m

=> Circumference = 2 × (22/7) × 63

=> Circumference = 2 × 22 × 9

=> Circumference = 44 × 9 = 396 m

Therefore The correct answer is 396 m.

Additional Information

Largest Circle inside a Rectangle

The diameter is always equal to the shorter side (breadth) of the rectangle.

Largest Circle inside a Square

The diameter is equal to the side of the square. Area = π × $(a/2)^2$.

Largest Square inside a Circle

The diagonal of the square is equal to the diameter of the circle. Side = d ÷ √2.

Q69. Answer: (a) 80

Shortcut Trick

When the distance covered is equal for both parts of the journey, the average speed formula is:

Average Speed = (2 × S1 × S2) ÷ (S1 + S2)

=> Average Speed = (2 × 72 × 90) ÷ (72 + 90)

=> Average Speed = 12960 ÷ 162 = 80

Therefore The correct answer is 80 km/hr.

Alternate Method

Kanpur

Lucknow

Distance = D

Speed = 72 km/hr

Speed = 90 km/hr

Given:

Speed from Kanpur to Lucknow (S1) = 72 km/hr

Speed from Lucknow to Kanpur (S2) = 90 km/hr

Method: LCM Approach

=> Let the distance between Kanpur and Lucknow be the LCM of the speeds 72 and 90.

=> LCM of 72 and 90 = 360

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=> Let total distance one way = 360 km
=> Time taken for onward journey = 360 ÷ 72 = 5 hours
=> Time taken for return journey = 360 ÷ 90 = 4 hours
=> Total Distance for the entire journey = 360 + 360 = 720 km
=> Total Time taken = 5 + 4 = 9 hours
=> Average Speed = Total Distance ÷ Total Time
=> Average Speed = 720 ÷ 9 = 80 km/hr
Therefore The correct answer is 80 km/hr.
Additional Information
Average Speed for Three Equal Distances
If a person covers three equal distances at speeds x, y, and z, the average speed is (3 × x × y × z) ÷ (xy + yz + zx).
Average Speed for Unequal Distances
When different distances are covered, the average speed is always calculated as Total Distance ÷ Total Time.
Relative Speed
When two bodies move in opposite directions, their relative speed is S1 + S2. When moving in the same direction, it is |S1 − S2|.

Q70. Answer: (c) 1

Shortcut Trick
Put β = 45° in the given expression:
=> $\sec^2(45°) - 1 / (\text{cosec}^2(45°) - 1)$
=> $(\sqrt{2})^2 - 1 / ((\sqrt{2})^2 - 1)$
=> 2 − 1 / (2 − 1)
=> 2 − 1 / 1 = 1
Therefore The correct answer is 1.
Alternate Method
Given:
$\sec^2\beta - 1 / (\text{cosec}^2\beta - 1)$
Formula Used:
$\text{cosec}^2\theta - \cot^2\theta = 1 \Rightarrow \text{cosec}^2\theta - 1 = \cot^2\theta$
$1 / \cot\theta = \tan\theta$
$\sec^2\theta - \tan^2\theta = 1$
Calculations:
=> $\sec^2\beta - 1 / (\text{cosec}^2\beta - 1)$
=> $\sec^2\beta - 1 / (\cot^2\beta)$
=> $\sec^2\beta - \tan^2\beta$
=> 1
Therefore The correct answer is 1.
Additional Information
Basic Trigonometric Identities
$\sin^2\theta + \cos^2\theta = 1$
Reciprocal Relations
$\sin\theta = 1 / \text{cosec}\theta$ | $\cos\theta = 1 / \sec\theta$ | $\tan\theta = 1 / \cot\theta$
Quotient Relations
$\tan\theta = \sin\theta / \cos\theta$ | $\cot\theta = \cos\theta / \sin\theta$

Q71. Answer: (b) 3

Given:
(Left) © & 9 4 5 # 6 2 $ © 8 2 £ @ & # 5 £ % & # 1 (Right)
Now,
Symbols, which are immediately preceded by a number and also immediately followed by a number.
So, Needed pattern is: Number - Symbol - Symbol.
There are 3 symbols which is immediately preceded by a number and also immediately followed by another symbol.

Hence, the correct answer is 'Option 2'.

Q72. Answer: (d) One

Given: A, B, C, D, J, K and L are sitting around a circular table, facing the center of the table.

1) L sits to the immediate right of D.

2) Only three people sit between L and C when counted from the left of L.

3) Only three people sit between D and J.

4) A sits to the immediate right of K.

So, B will sit on the remaining place.

There is one people sitting between D and K if counted from the right.

Hence, the correct answer is "Option 4".

Q73. Answer: (a) GL-HF

The logic followed here is:

Logic:

Here, 'GL-HF' is odd among the given options.

Hence, the correct answer is "Option 1".

Q74. Answer: (b) 7

The logic followed here is:

Logic:

The difference between the highest 8 and lowest 1 is 7.

Hence, the correct answer is "Option 2".

Q75. Answer: (b) 115

The logic followed here is:

thus, "115" will replace the question mark in the given series.

Hence, the correct option is "Option 2".

Q76. Answer: (b) 92

BODMAS Table:

Given equation: (117 A 3) C (119 A 7) C 24 D 6 C (117 A 13) B 2 = ?

Now,

A	B	C	D
÷	x	•	•

then:

=> (117 ÷ 3) + (119 ÷7) + 24 - 6 + (117 ÷ 13) x 2 = ?

=> (39) + (17) + 24 - 6 + (9) x 2 = ?

=> (39) + (17) + 24 - 6 + 18 = ?

=> 98 - 6 = ?

=> 92 = ?

Hence, the correct answer is "Option 2".

Q77. Answer: (b) 153

BODMAS Table:

Given equation: 25 ÷ 6 − 8 + 20 × 4 = ?

Now, if '+' and '-' and '×' and '÷' are interchanged, then:

=> 25 × 6 + 8 - 20 ÷ 4 = ?

=> 25 × 6 + 8 - 5 = ?

=> 150 + 8 - 5 = ?

=> 150 + 3 = 153

Hence, the correct answer is "Option 2".

Q78. Answer: (a) 5

The logic followed here is:

Logic: E is common in both the words, 5 is also common in both the numbers.

So, the code for ‘E’ in the given code language is 5.

Hence, the correct answer is "Option 1".

Q79. Answer: (c) 7 km towards north

Given:

Rajeev starts from Point A and drives 8 km towards east.

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

He then takes a left turn and drives 11 km. He takes a final right turn.

Then drives 4 km and stops at Point P.

So, he should drive 7 km towards north in order to reach Point A again.

Hence, the correct answer is "Option 3".

Q80. Answer: (c) KWJ 25

The logic followed here is:

So, 'KWJ 25' will replace the question mark in the given series.

Hence, the correct answer is "Option 3".

Q81. Answer: (a) Mother's mother

Family Chart:

Decoding the Symbols:

Symbol	=	#	%	¥
Meaning	Wife	Brother	Mother	Father

Given: 'D % E = L ¥ T # A'?

It means: D is the Mother of E, E is the Wife of L, L is the Father of T, T is the Brother of A.

So, D is Mother's mother to A

Hence, the correct answer is "Option 1".

Q82. Answer: (c) Both conclusions (I) and (II) follow.

Given Statements:

All meters are compasses.

All compasses are scales.

The least possible Venn diagram for the given statement is:

Conclusions:

I. Some scales are compasses.

• Since "All compasses are scales" (Statement 2), it means the entire group of Compasses is part of the Scales group. Therefore, it is definitively true that at least "Some scales are compasses."

Conclusion (I) logically follows.

II. All meters are scales.

• Since "All meters are compasses" (Statement 1) and "All compasses are scales" (Statement 2), by the transitive property of inclusion, all meters must necessarily be scales.

Conclusion (II) logically follows.

So, Both Conclusion (I) and Conclusion (II) logically follow from the given statements.

Hence, the correct answer is "Option 3".

Q83. Answer: (c) (92, 79, 66)

The logic followed here is:

Logic: The sets follow an arithmetic progression where each number decreases by 13 from the preceding number.

(75, 62, 49)

=> Difference 1: 75 - 62 = 13

=> Difference 2: 62 - 49 = 13

(61, 48, 35)
=> Difference 1: 61 - 48 = 13
=> Difference 2: 48 - 35 = 13
Now, checking the options:
Option 1) (73, 60, 53)
=> Difference 1: 73 - 60 = 13
=> Difference 1: 60 - 53 = 7
Option 2) (48, 24, 12)
=> Difference 1: 48 - 24 = 24
=> Difference 1: 24 - 12 = 12
Option 3) (92, 79, 66)
=> Difference 1: 92 - 79= 13
=> Difference 1: 79 - 66 = 13
Option 4) (66, 52, 41)
=> Difference 1: 66 - 52 = 14
=> Difference 1: 52 - 41 = 11
Hence, the correct option is "Option 3"

Q84. Answer: (c) AFVG

The logic followed here is:
Logic:
Similarly,
So, the code for 'HKQZ' in the given code language is 'AFVG'.
Hence, the correct answer is "Option 3".

Q85. Answer: (c) KE-MI

The logic followed here is:
Logic:
Here, 'KE-MI' is odd among the given options.
Hence, the correct answer is "Option 3".

Q86. Answer: (c) ILHN

The logic followed here is:
Logic:
and
Similarly,
So, the code for 'EHEK' in the given code language is 'ILHN'
Hence, the correct answer is "Option 3".

Q87. Answer: (c) Two

Given: (Left) 5 # % 2 ^ @ 3 & 1 $ 7 Ω 5 2 # 6 * 1 9 (Right)
Now,
Symbols, which are immediately preceded by a number and also immediately followed by a number.
So, Needed pattern is: Number - Symbol - Symbol.
There are 2 Symbols which are preceded by a number and also immediately followed by a symbol.
Hence, the correct answer is 'Option 3'.

Q88. Answer: (c) Only conclusion (II) follows.

Given Statements:
Some kites are hats.
No hat is a bat.
The least possible Venn diagram for the given statement is:
Conclusions:
I. Some kites are bats.

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From the statements, we know that the Hats group and the Bats group are separate.

The Kites that are not Hats could potentially be Bats, or they could not be. Since it is not necessarily true, this conclusion does not logically follow.

II. Some hats are kites.

The nature of "Some" (I-type proposition) is that it is reversible.

Therefore, if Some Kites are Hats, then Some Hats are Kites must be true.

Conclusion (II) logically follows.

So, Only conclusion (II) follows.

Hence, the correct answer is "Option 3".

Q89. Answer: (d) VCA 159

The logic followed here is:

So, 'VCA 159' will replace the question mark in the given series.

Hence, the correct answer is "Option 4".

Q90. Answer: (a) 32

Given:

Nushrat's rank from the bottom (R_(bottom)): 12th

Nushrat's rank from the top (R_(top)): 21st

T = Rbottom + Rtop - 1

So,

Total Students = 21 + 12 - 1 = 33 - 1 = 32

So, there are '32' students in Amit's class.

Hence, the correct answer is "Option 1".

Q91. Answer: (b) One

Correct Option - 2

The logic followed here is:

Logic:

The original number has 8 digits. We compare the digits in each position (from left to right).

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

So, Only the digit 9 in the last position remains unchanged.

The total number of digits whose position remains unchanged is 1.

Hence, the correct answer is "Option 2"

Q92. Answer: (b) JF 18

The logic followed here is:

Logic:

Similarly,

So, the code for 'GC 13' in the given code language is 'JF 18'

Hence, the correct answer is "Option 2".

Q93. Answer: (a) 2

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

1) Only one person sits between C and D when counted from the right of C.

2) Only one person sits between D and A.

3)Only one person sits between C and B.

4)Only two people sit between F and A.

5)Only one person sits between E and B.

So, Only '2' people sit between G and E.

Hence, the correct answer is "Option 1".

Q94. Answer: (c) 78

Amit's rank from the top : 34th
Amit's rank from the bottom : 45th
So, Total Students= 34 + 45 - 1 = 79 - 1 = 78
So, there are '78' students in Amit's class.
Hence, the correct answer is "Option 3".

Q95. Answer: (a) North

Given:
Town B is to the south of Town A.
Town C is to the west of Town A.
Town D is to the west of Town C.
Town E is to the north of Town D and also to the south of Town F.
So, Town F is northwards to Town D.
Hence, the correct answer is "Option 1".

Q96. Answer: (a) 148

The logic followed here is:
thus, "148" will replace the question mark in the given series.
Hence, the correct option is "Option 1".

Q97. Answer: (b) PA - TH

The logic followed here is:
Logic:
Here, 'PA - TH' is odd among the given options.
Hence, the correct answer is "Option 2".

Q98. Answer: (c) 57

The logic followed here is:
thus, "57" will replace the question mark in the given series.
Hence, the correct option is "Option 3".

Q99. Answer: (d) 19th

Given: 47 students facing North
Sonika is 18th from the left end.
Dhruv is 11th to the right of Sonika
So, Position(Right) = Total students - Position(Left) + 1
Position(Right) = 47 - 29 + 1 = 19th
So, Dhruv's position from the right-end of the line is 19th.
Hence, the correct answer is "Option 4".

Q100. Answer: (b) 8

The logic followed here is:
Logic: U is common in both the words and 8 is common in both the number codes.
So, the code for ‘U’ in the given code language is 8.
Hence, the correct answer is "Option 2".

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