RRB NTPC (UG) CBT-I Official Paper (Held On: 20 Aug, 2025 Shift 1) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. In which state did the Indian Army conduct the tri-service integrated multi-domain warfare exercise, 'Prachand Prahaar', in March 2025?

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

Q2. Which internaonal observance, celebrated on 3 March 2025, had the theme 'Wildlife Conservaon Finance: Invesng in People and Planet'?

(a) Internaonal Day for Biological Diversity
(b) World Environment Day
(c) Earth Day
(d) World Wildlife Day

Q3. Which Delhi Sultan captured Bukka and Harihara after the fall of the Kakatiya Kingdom?

(a) Firoz Shah Tughlaq
(b) Balban
(c) Muhammad bin Tughlaq
(d) Alauddin Khalji

Q4. Which mountain is located in South America?

(a) Rockies
(b) Alps
(c) Vosges
(d) Andes

Q5. Which author released 'The Himalaya in a Small House' in 2025, chronicling life in a Himalayan village?

(a) Amitav Ghosh
(b) Ruskin Bond
(c) Anuradha Roy
(d) Namita Gokhale

Q6. Which of the following is India's first cheetah conservation breeding centre, approved by the Central Zoo Authority (CZA) in 2024?

(a) Gandhi Sagar Wildlife Sanctuary
(b) Banni grasslands
(c) Bandhavgarh National Park
(d) Tadoba National Park

Q7. According to the Census of India 2011, which is the most Urbanised state of India?

(a) Kerala
(b) Goa
(c) Punjab
(d) Haryana

Q8. Which of the following options lies between the Western Ghats and the Arabian Sea?

(a) Malwa Plateau
(b) Deccan Plateau
(c) Eastern Coastal Plain
(d) Western Coastal Plain

Q9. During which of the following dynasties was the Kailasa Temple at Ellora built?

(a) Cholas
(b) Chalukyas
(c) Pallavas
(d) Rashtrakutas

Q10. As of May 2025, former cricketer Harbhajan Singh represents which political party in the Rajya Sabha?

(a) Aam Aadmi Party
(b) Bharatiya Janata Party
(c) Indian National Congress
(d) Shiromani Akali Dal (Badal)

Q11. Which of the following shortcut keys is used to switch between open applications in Windows?

(a) Alt + Ins
(b) Alt + F4
(c) Alt + Del
(d) Alt + Tab

Q12. The Sarkaria Commission primarily focussed on strengthening which type of federalism in India?

(a) Co-operative federalism
(b) Fiscal federalism
(c) Unitary federalism
(d) Competitive federalism

Q13. Liberalisation reduced government control over economic activities. What did liberalisation in 1991 primarily aim to eliminate?

(a) Banking services
(b) Industrial licensing and quota system
(c) Public sector employment
(d) Agricultural subsidies

Q14. Under Article 244(2) of the Constitution of India, the provisions of the Sixth Schedule apply to the administration of tribal areas in which of the following sets of States?

(a) Gujarat, Madhya Pradesh, Rajasthan and Chhattisgarh
(b) Assam, Meghalaya, Tripura and Mizoram
(c) Nagaland, Manipur, Meghalaya and Arunachal Pradesh
(d) Bihar, Odisha, West Bengal and Assam

Q15. How many mutually independent base quantities are there in the current International System of Units (SI)?

(a) 7
(b) 10
(c) 6
(d) 13

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Q16. Which of the following Indian states received a World Bank loan of Rs. 2,424 crore to upgrade healthcare?

(a) Gujarat
(b) Andhra Pradesh
(c) Rajasthan
(d) Kerala

Q17. Which of the following Fundamental Rights is guaranteed under Article 14 of the Indian Constitution?

(a) Equality before the law
(b) Right to freedom of religion
(c) Prohibition of child labour
(d) Protection of life and personal liberty

Q18. Identify the correct combination of the abbreviation, its full form and its application.

(a) CD – Compact Disk – Used for high-speed internet access
(b) ASCII – Automated Symbolic Code for Integrated Input – Converts images to code
(c) ASCII – American Standard Code for Information Interchange – Encodes text in computers
(d) LAN – Large Area Network – Used for connecting computers across continents

Q19. Who among the following officials was responsible for maintaining law and order in a village during Sher Shah's administration?

(a) Qazi
(b) Muqaddam
(c) Shiqqdar
(d) Fotedar

Q20. Where is the primary focus of the Sampoorna Grameen Rozgar Yojana (SGRY)?

(a) Urban areas
(b) Coastal areas
(c) Industrial areas
(d) Rural areas

Q21. Which undersea defence weapon was successfully trialed by the Indian Navy in May 2025?

(a) Deep-Sea Explosive
(b) Hydro Depth Torpedo
(c) Submarine Neutralizer
(d) Multi-Influence Ground Mine

Q22. The main reason for the Partition of India in 1947 was ___.

(a) Communal tensions and political disagreements
(b) Language dispute
(c) British administrative failure
(d) Social and Economic differences in community

Q23. Which of the following rivers belongs to the Peninsular Plateau?

(a) Krishna river
(b) Lohit river
(c) Beas river
(d) Dibang river

Q24. At the Doha Diamond League 2025, after throwing beyond 90 metres, Neeraj Chopra achieved which historic distinction for Indian athletics?

(a) He broke the world record for the longest javelin throw.
(b) He became the 1st Indian athlete to surpass the 90-metre mark in javelin throw.
(c) He became the 3rd Indian athlete to surpass the 90-metre mark in javelin throw.
(d) He became the 2nd Indian athlete to surpass the 90-metre mark in javelin throw.

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Q25. Which of the following is the most abundant protein in the biosphere?

(a) GLUT-4
(b) Collagen
(c) RuBisCO
(d) Myosin

Q26. In which of the following years did Lord Curzon pass the Indian Universities Act, imposing strict control over Indian universities?

(a) 1886
(b) 1897
(c) 1904
(d) 1889

Q27. With which of the following countries has Armenia signed a peace treaty in March 2025?

(a) Georgia
(b) Azerbaijan
(c) Turkey
(d) Syria

Q28. The Fifth Schedule of the Indian Constitution contains provisions for the administration and control of which of the following?

(a) Scheduled Areas and Scheduled Tribes
(b) Official languages of India
(c) Union and State Lists of the Seventh Schedule
(d) Disqualification of legislators on grounds of defection

Q29. What does Section 498A of the Indian Penal Code (IPC) deal with?

(a) Dowry death
(b) Domestic violence protection
(c) Cruelty by husband or his relatives towards a woman
(d) Child marriage

Q30. As of March 14, 2024, which of the following is Asia's longest tunnel?

(a) Pir Panjal Railway Tunnel
(b) Zojila Tunnel
(c) Tike Tunnel
(d) Natuwadi Tunnel

Q31. Which of the following kitchen chemicals is commonly used to preserve pickles?

(a) Vinegar
(b) Yeast
(c) Baking soda
(d) Sugar

Q32. When was the Real Estate (Regulation and Development) Act (RERA) enacted to regulate and promote the real estate sector, ensuring transparency and accountability in transactions and protecting the interests of homebuyers?

(a) 2020
(b) 2016
(c) 2018
(d) 2012

Q33. Who administers the oath of office to the Governor?

(a) President
(b) Vice-President
(c) Chief Justice of High Court

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(d) Chief Minister

Q34. Which Indian think tank organised the 2025 World Sustainable Development Summit (WSDS)?

(a) The Energy and Resource Institute (TERI)
(b) Centre for Science and Environment (CSE)
(c) National Institution for Transforming India (NITI) Aayog
(d) Research and Information System (RIS)

Q35. VARUNA is a bilateral naval exercise between India and:

(a) the US
(b) South Korea
(c) France
(d) the UK

Q36. What was the outcome of the 2025 Delhi Legislative Assembly elections?

(a) AAP retained power with an increased majority.
(b) BJP won a majority, forming the government.
(c) Hung assembly; a coalition was formed between BJP and Congress.
(d) Congress won for the first time in over a decade.

Q37. When was the Community Development Programme (CDP) launched in India?

(a) 1 July 1951
(b) 2 October 1952
(c) 1 January 1947
(d) 1 March 1950

Q38. The names of Dora Bisoi and Chakra Bisoi are associated with the uprising against political unrest, the unsuitability of British laws and regulations and the economic suffering of the Khonds in _____.

(a) Eluru, Andhra Pradesh
(b) Mandawa, Rajasthan
(c) Ghumusar, Odisha
(d) Jandiala, Punjab

Q39. Which Indian football club won the 2025 Kalinga Super Cup?

(a) Jamshedpur FC
(b) FC Goa
(c) Bengaluru FC
(d) ATK Mohun Bagan

Q40. Which Indian city is home to the Motilal Nehru National Institute of Technology (MNNIT), where research on lightning impact on planes is being conducted?

(a) Prayagraj
(b) Lucknow
(c) Varanasi
(d) Kanpur

MATHEMATICS

Q41. The number of prime numbers lying between 476 and 485, both included, is:

(a) 2
(b) 1
(c) 4
(d) 6

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Q42. A shopkeeper is given a 10% trade discount and a 5% scheme discount (free units). On purchasing 100 units priced at Rs. 50 each, what is the trade discount amount?

(a) Rs. 500
(b) Rs. 250
(c) Rs. 1,000
(d) Rs. 700

Q43. 5 men can complete a piece of work in 18 days, while 9 women can do it in 5 days. In how many days can 3 women and 3 men complete this work?

(a) 5 days
(b) 10 days
(c) 7 days
(d) 8 days

Q44. By how much is 65% of 65 greater than 4/5 of 15?

(a) 24.25
(b) 28.25
(c) 27.25
(d) 30.25

Q45. A discount of 13% on the marked price of an article is allowed and then the article is sold for Rs. 348. The marked price of the article is:

(a) Rs. 392
(b) Rs. 420
(c) Rs. 380
(d) Rs. 400

Q46. If 36% of first number is equal to four-sevenths of second number, what is the ratio of first number to the second number?

(a) 95 : 60
(b) 100 : 63
(c) 99 : 62
(d) 104 : 61

Q47. Kushal and Brijesh together invested Rs. 37,100 in a business. At the end of the year, out of a total profit of Rs. 12,000, Brijesh's share was Rs. 5,700. What was the difference between their investments?

(a) Rs. 1,855
(b) Rs. 1,742
(c) Rs. 3,438
(d) Rs. 2,347

Q48. A trader claims to sell grains at a profit of 29%, but also dishonestly uses a weight which is 13% less than what is mentioned on it. Find the total percentage of profit earned by the trader. (Round off the answer to the nearest whole number.)

(a) 50%
(b) 43%
(c) 48%
(d) 49%

Q49. The product of two consecutive natural numbers is 6. The greater of the two numbers is:

(a) 2
(b) 19
(c) 3
(d) 5

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Q50. The average of first 152 odd natural numbers, is:

(a) 152.5
(b) 153
(c) 152
(d) 151.5

Q51. If $(\sin \alpha + \cos \alpha)/(\sin \alpha - \cos \alpha) = 3$, then the value of $\sin^2 \alpha$ is

(a) 3/5
(b) 2/5
(c) 4/5
(d) 1/5

Q52. The population of a district is 329000, out of which 209000 are males. 44% of the population is literate. If 44% males are literate, then what percentage of females are literate?

(a) 42%
(b) 45%
(c) 44%
(d) 46%

Q53. Train A leaves station M at 8:00 a.m. and reaches station N at 3:00 p.m. on the same day. Train B leaves station N at 10:00 a.m. and reaches station M at 3:00 p.m. on the same day. Find the time when Trains A and B meet.

(a) 5:46 a.m.
(b) 12:05 p.m.
(c) 11:14 a.m.
(d) 6: 47 a.m.

Q54. A, B and C invest a sum in the ratio of 61 : 43 : 90, respectively. If they earned a total profit of Rs. 2,910 at the end of the year, then what is the difference between share of B and C?

(a) Rs. 753
(b) Rs. 705
(c) Rs. 807
(d) Rs. 633

Q55. ABCD is a trapezium in which BC || AD and AC = CD. If angle ABC = 20 deg and angle BAC = 131 deg, then what is the measure of angle ACD (in degree)?

(a) 111°
(b) 128°
(c) 122°
(d) 113°

Q56. A sum of Rs. 2,500 is invested in a bank at 2% interest per annum compounded annually. On maturity, the amount payable becomes Rs. 2,601. Find the time period of the investment.

(a) 2 years
(b) 1 year
(c) 2.5 years
(d) 1.5 years

Q57. Evaluate: $(-9) - (-60) \div (-10) + (-3) \times 8$

(a) -42
(b) -38
(c) -39
(d) -41

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Q58. The average price of three items of furniture is Rs. 16,050. If their prices are in the ratio 3 : 5 : 7, the price of the cheapest item (in Rs.) is:

(a) 7,490
(b) 9,630
(c) 5,350
(d) 3,210

Q59. A cylindrical rod has an outer curved surface area of 1800 cm^2. If the length of the rod is 52 cm, then the outer radius (in cm) of the rod, correct to two places of decimal, is: Take $\pi=22/7$.

(a) 6.32
(b) 5.51
(c) 5.37
(d) 6.69

Q60. The sum of two numbers is 80 and their L.C.M. is 558. What are the two numbers?

(a) 16, 64
(b) 18, 62
(c) 23, 57
(d) 11, 69

Q61. The number 788973289 is divisible by which of the following?

(a) 12
(b) 7
(c) 13
(d) 18

Q62. Find the simple interest (in Rs.) if a sum of Rs. 400 is borrowed for 4.5 years at 8% per annum rate of interest.

(a) 124
(b) 194
(c) 144
(d) 244

Q63. 56 tube lights were purchased for Rs. 56, and 20 tube lights broke in transit. The trader sold the remaining tube lights at Rs. 4.60 each. Find his profit.

(a) Rs. 112.50
(b) Rs. 112.60
(c) Rs. 109.60
(d) Rs. 120.80

Q64. A spherical tank has a diameter of 10 metres. What is the volume of the spherical tank? (Use π = 3.141)

(a) 423.5 cubic metre
(b) 523.5 cubic metre
(c) 492.6 cubic metre
(d) 504.8 cubic metre

Q65. A can lay railway track between two given stations in 16 days and B can do the same job in 11 days. With the help of C, they did the job in 3 days only. Then, C alone can do the job in

(a) 953/95
(b) 1353/95
(c) 553/95
(d) 1153/95

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Q66. Simplify the following.

$4((3/4)x^2-26x+17)-3(x^2+4x-14)$

(a) -116x + 110
(b) −116x − 110
(c) 116x − 10
(d) 116x + 110

Q67. 7 years ago, the age of a father was 13 years more than twice his son's age. After how many years, from now, will he be twice his son's age?

(a) 4
(b) 8
(c) 7
(d) 6

Q68. What smallest number should be added to 57846 so that the sum is completely divisible by 58?

(a) 38
(b) 43
(c) 41
(d) 42

Q69. A bus travelling at 95 km/hr completes a journey in 10 hours. What should be in its speed to cover the same distance in 5 hours?

(a) 190 km/hr
(b) 182 km/hr
(c) 187 km/hr
(d) 193 km/hr

Q70. Find the value of: [836 ÷ {30 + 2 × (7 − 3)}].

(a) 20
(b) 21
(c) 22
(d) 27

GENERAL INTELLIGENCE AND REASONING

Q71. What should come in place of the question mark (?) in the given series?

12 21 40 69 108 ?

(a) 157
(b) 143
(c) 137
(d) 149

Q72. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. Only three boxes are kept below G. Only two boxes are kept between G and F. Only B is kept above D. E is kept at some place below A and at some place above C. How many boxes are kept above A?

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

Q73. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

UWZ SUX QSV OQT ?

(a) MOS
(b) MPS

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(c) MOR
(d) MPR

Q74. In a certain code language, ‘close your window’ is written as ‘mb tb jb’ and ‘door or window ’ is coded as ‘lk mb fb’. How is ‘window’ coded in the given language?
(a) mb
(b) lk
(c) fb
(d) tb

Q75. 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 conclusions logically follow(s) from the statements.
Statements: All triangle are rectangle. All square are rectangle.
Conclusion (I): Some triangle are square.
Conclusion (II): Some rectangle are square.
(a) Neither conclusion (I) nor (II) follows.
(b) Only conclusion (I) follows
(c) Both conclusions (I) and (II) follow
(d) Only conclusion (II) follows.

Q76. In a certain code language,
A $ B means 'A is the son of B'
A + B means 'A is the brother of B'
A@B means 'A is the wife of B'
A ÷ B means 'A is the father of B'
Based on the above, how is E related to N if 'E $ F @ G ÷ M + N'?
(a) Mother
(b) Sister
(c) Father
(d) Brother

Q77. What should come in place of the question mark (?) in the given series based on the English alphabetical order?
GMR AGL UAF OUZ ?
(a) TIO
(b) TOI
(c) ITO
(d) IOT

Q78. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.
(Left) 3 * 8 & @ 9 $ 1 & 5 Ω 6 # 7 % 4 £ 2 (Right)
How many such symbols are there, each of which is immediately preceded by an odd number but NOT immediately followed by an even number?
(a) More than two
(b) One
(c) Two
(d) None

Q79. In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.
ROAM – MORA – OARM
CRIB – BRCI – RICB
(a) PING – PNIG – GNIP

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(b) FUME – EUFM – UMFE
(c) SONG – OSNG – GONS
(d) GUYS – SUGY – YUGS

Q80. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) KN-GI
(b) SV-OQ
(c) OR-KM
(d) VY-RS

Q81. What should come in place of the question mark (?) in the given series?

6 24 27 108 111 ?

(a) 303
(b) 393
(c) 409
(d) 444

Q82. If ‘A’ stands for ‘÷’, ‘B’ stands for ‘×’, ‘C’ stands for ‘+’ and ‘D’ stands for ‘−’, what will come in place of the question mark (?) in the following equation?

10 B 3 D 27 C 18 A 2 = ?

(a) 18
(b) 7
(c) 25
(d) 12

Q83. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All rectangles are squares.

All squares are trapezoids.

Conclusions:

I. All trapezoids are rectangles.

II. Some trapezoids are rectangles.

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

Q84. 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) SP-AV
(b) JG-RM
(c) QN-YT
(d) BY-JF

Q85. Seven boxes V, W, X, Y, Z, Q and R are kept one over the other but not necessarily in the same order. V is kept second from the bottom. Only three boxes are kept between V and Y. Z is kept at one of the positions below V. Only Q is kept between Y and R. W is kept at one of the positions above Y. How many boxes are kept between X and Y?

(a) Three
(b) Four

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(c) Two
(d) One

Q86. Hriday ranked 26th from the top and 38th from the bottom in his class. How many students are there in his class?
(a) 61
(b) 63
(c) 64
(d) 62

Q87. 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) SO-LQ
(b) PL-IN
(c) VR-OT
(d) MI-FL

Q88. What will come in place of '?' in the following equation if '+' and '−' are interchanged and 'x' and '÷' are interchanged?
8 ÷ 6 + 78 × 6 − 17 = ?
(a) 52
(b) 66
(c) 45
(d) 59

Q89. WPKD is related to BUPI in a certain way based on the English alphabetical order. In the same way, QJEX is related to VOJC. To which of the given options is FYTM related, following the same logic?
(a) KDYR
(b) KDRY
(c) KYRD
(d) KYDR

Q90. 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 4 @ 6 9 5 # * + 4 9 % \ & + < > > ^ # (Right)
How many such numbers are there, each of which is immediately preceded by a symbol and also immediately followed by another number?
(a) None
(b) Three
(c) One
(d) Two

Q91. Person X starts from point A and drives 5 km towards the south. He then takes a left turn, drives 5 km, turns right and drives 5 km. He then takes a right turn and drives 7 km. He then takes a right turn, drives 10 km. He then takes a final left turn and drives 3 km and stops at point B. How far (shortest distance) and towards which direction should he drive in order to reach point A again? (All turns are 90 degrees unless specified)
(a) 5 km west
(b) 5 km east
(c) 3 km south
(d) 5 km south

Q92. Manoj starts from Point Y and drives 16 km towards north. He then takes a right turn and drives 4 km. He then turns right and drives 16 km. He takes a final left turn, drives 4 km and stops at Point Z. How far (shortest distance) and towards which direction should he drive in order to reach Point Y again? (All turns are 90-degree turns only, unless specified.)
(a) 8 km towards west
(b) 4 km towards north

(c) 4 km towards east
(d) 6 km towards north

Q93. In the following number-pairs, the second number is obtained by applying certain mathematical operation(s) to the first number. Select the number-pair in which the numbers are related in the same way as are the numbers of the following pairs. (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

27,135

33,165

(a) 22, 110
(b) 35, 180
(c) 29, 125
(d) 19, 105

Q94. A, B, C, D, J, K and L are sitting around a circular table, facing the centre of the table. Only three people sit between J and L when counted from the left of J. Only three people sit between K and C when counted from the right of C. D sits to the immediate right of K. A is an immediate neighbour of C as well as L. Who sits second to the left of B?

(a) K
(b) C
(c) A
(d) D

Q95. What should come in place of the question mark (?) in the given series?

491 492 496 505 521 ?

(a) 541
(b) 531
(c) 546
(d) 536

Q96. AHJQ is related to DJMS in a certain way based on the English alphabetical order. In the same way, MPVY is related to PRYA. To which of the given options is VVEE related, following the same logic?

(a) YGHJ
(b) YGFT
(c) YXHG
(d) YXGH

Q97. Seven people, G, H, I, J, K, L and S, are sitting in a row facing North. Only five people sit between K and G. H sits to the immediate left of G. Only one person sits between H and S. L sits at some place to the left of J but at some place to the right of I. Who sits third from the left end of the line?

(a) H
(b) L
(c) S
(d) I

Q98. If 1 is added to each even digit and 2 is subtracted from each odd digit in the number 9342865, then what will be the sum of the digits that are first from the left and first from the right in the new number thus formed?

(a) 9
(b) 10
(c) 8
(d) 7

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Q99. In a certain code language, 'MUTE' is coded as '4527' and 'TOPS' is coded as '1346'. What is the code for 'T' in that language?

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

Q100. If 1 is added to each even digit and 3 is subtracted from each odd digit in the number 6798245, what will be difference between the highest and second lowest digits thus formed?

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

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Arunachal Pradesh

The correct answer is Arunachal Pradesh.

Key Points

• The Indian Army conducted the tri-service integrated multi-domain warfare exercise, 'Prachand Prahaar', in March 2025, in the state of Arunachal Pradesh.

• The exercise aimed to test and enhance the combat readiness of the armed forces in multi-domain operations, which include integrating operations across air, land, and cyberspace domains.

• Arunachal Pradesh is strategically significant due to its proximity to the India-China border. Such exercises are crucial for reinforcing India's defense preparedness in the region.

• It involved the participation of all three services—Army, Navy, and Air Force—along with advanced weaponry, drones, and surveillance systems to counter modern warfare challenges.

• Exercises like 'Prachand Prahaar' are particularly important in the context of evolving geopolitical tensions and the need for effective coordination among the Indian Armed Forces.

Additional Information

• Arunachal Pradesh:

• Located in the northeastern part of India, Arunachal Pradesh shares borders with China, Bhutan, and Myanmar.

• The state is strategically important due to its location near the Line of Actual Control (LAC) with China.

• Arunachal Pradesh has been a site for multiple military exercises to strengthen India's defense capabilities.

• The region's difficult terrain and climatic conditions make it a challenging but essential area for military preparedness.

• Importance of Tri-Service Exercises:

• Tri-service exercises like 'Prachand Prahaar' are designed to integrate the capabilities of the Army, Navy, and Air Force to ensure seamless coordination during conflicts.

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• They play a key role in preparing for modern warfare scenarios that require multi-domain operations, including cyber and space-based strategies.

• Such exercises are vital for testing the efficacy of newly inducted weapons and technologies in real-time scenarios.

• They also foster interoperability among the services, which is crucial for effective joint operations.

• India-China Border Developments:

• India and China have had ongoing border disputes, particularly in the eastern sector, which includes Arunachal Pradesh.

• Military exercises in these regions are critical for ensuring India's preparedness and sending a strong message of defense capability.

• Other recent exercises in the region include 'Operation Gagan Shakti' and 'HimVijay', both aimed at strengthening India's defense posture.

Important Points

• India's Military Preparedness:

• India regularly conducts military exercises in border states to ensure the readiness of its forces to respond to external threats.

• These exercises include simulations of real-world conflict scenarios and training on advanced weaponry and technologies.

• Arunachal Pradesh, due to its strategic location, remains a critical area for such operations, especially in light of its proximity to China.

• Significance of Multi-Domain Warfare:

• Multi-domain warfare involves integrating operations across land, air, sea, cyber, and space domains.

• It addresses the challenges posed by modern warfare, where threats can emerge simultaneously across multiple domains.

• Exercises like 'Prachand Prahaar' aim to prepare the armed forces to operate effectively in such complex scenarios.

Q2. Answer: (d) World Wildlife Day

The correct answer is World Wildlife Day.

Key Points

• World Wildlife Day is celebrated annually on 3 March to raise awareness about wildlife conservation and the importance of protecting biodiversity.

• The theme for World Wildlife Day 2025 is 'Wildlife Conservation Finance: Investing in People and Planet', focusing on sustainable finance mechanisms and the role of individuals and communities in conservation efforts.

• World Wildlife Day was proclaimed by the United Nations General Assembly in 2013, during its 68th session, to coincide with the adoption of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1973.

• The day emphasizes the critical role of wildlife in maintaining ecological balance and the necessity of combating threats like illegal wildlife trade, habitat destruction, and climate change.

• World Wildlife Day is officially celebrated under the leadership of the United Nations Environment Programme (UNEP) and CITES. It aims to strengthen collaboration among nations, organizations, and communities for wildlife protection.

Additional Information

• Convention on International Trade in Endangered Species (CITES):

• CITES is an international agreement between governments, established in 1973, to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

• CITES regulates trade in over 38,000 species, including animals, plants, and their derivatives, through a permit system.

• The agreement has been signed by 184 member countries, making it one of the most widely adopted environmental treaties globally.

• Wildlife Conservation Finance:

• Wildlife Conservation Finance refers to innovative mechanisms and funding models for financing conservation initiatives, including public-private partnerships, green bonds, and community-led projects.

• The focus is on mobilizing resources to preserve biodiversity, promote sustainable practices, and mitigate the impacts of climate change.

• Examples of such initiatives include the Global Environment Facility (GEF) and UNEP's Green Finance Platform.

• Other International Observances Related to Environmental Protection:

• International Day for Biological Diversity: Celebrated on 22 May, it focuses on biodiversity conservation and sustainable development.

• World Environment Day: Observed annually on 5 June, it is the largest global platform for environmental outreach.

• Earth Day: Celebrated on 22 April, it emphasizes global climate action and environmental protection.

• Threats to Wildlife:

• Illegal wildlife trade, habitat destruction, pollution, climate change, and overexploitation are the primary threats to wildlife globally.

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• Efforts to combat these threats include global treaties, national laws, and community-led conservation projects.

Important Points

• World Wildlife Day 2025 Theme:

• The theme 'Wildlife Conservation Finance: Investing in People and Planet' highlights the importance of sustainable financial models in conservation and the active involvement of local communities.

• It aims to create awareness about funding biodiversity conservation and encourage global action.

• Notable Wildlife Conservation Efforts:

• Project Tiger (India): Launched in 1973, it aims to conserve the tiger population and its habitats.

• Amazon Rainforest Conservation: International efforts focus on combating deforestation and preserving the world's largest tropical rainforest.

• Marine Protected Areas: Conservation initiatives to protect oceans and marine ecosystems from overfishing and pollution.

Q3. Answer: (c) Muhammad bin Tughlaq

The correct answer is Muhammad bin Tughlaq.

Key Points

• Muhammad bin Tughlaq was the Sultan of Delhi from 1325 to 1351. He was known for his ambitious and often controversial policies.

• After the fall of the Kakatiya Kingdom (in the early 14th century), Muhammad bin Tughlaq captured Bukka and Harihara, two brothers who later went on to establish the Vijayanagara Empire.

• The fall of the Kakatiya Kingdom was part of the broader expansion of the Delhi Sultanate under Muhammad bin Tughlaq, who sought to consolidate his control over the Deccan region.

• While Bukka and Harihara were captured initially, they later escaped or were released and established the Vijayanagara Empire in 1336, which became a significant power in South India.

• Muhammad bin Tughlaq’s reign is marked by his attempts to extend his empire southward, including ventures into the Deccan.

Additional Information

• Muhammad bin Tughlaq:

• He was the son of Ghiyasuddin Tughlaq and ascended the throne in 1325.

• Known for his ambitious projects, such as the transfer of the capital from Delhi to Daulatabad and the introduction of token currency.

• His policies often led to widespread discontent among his subjects, despite their innovative nature.

• He was a well-educated ruler, with interests in philosophy, science, and administration.

• Kakatiya Kingdom:

• The Kakatiya Kingdom was a prominent South Indian kingdom that ruled over the region of present-day Telangana and Andhra Pradesh.

• Its capital was Warangal, which was known for its strong fortifications and cultural achievements.

• The kingdom fell to the forces of the Delhi Sultanate under the reign of Muhammad bin Tughlaq.

• Bukka and Harihara:

• These brothers were initially commanders under the Kakatiya rulers.

• After their capture by Muhammad bin Tughlaq, they managed to establish the Vijayanagara Empire, which became a significant cultural and political center in South India.

• The Vijayanagara Empire was known for its contributions to art, architecture, and literature.

• Vijayanagara Empire:

• Founded in 1336 by Harihara I and Bukka I.

• It became a major Hindu kingdom in South India, resisting the spread of Islam and protecting cultural traditions.

• The empire lasted until 1646, with notable rulers like Krishnadevaraya.

Important Points

• Other Delhi Sultans:

• Firoz Shah Tughlaq: Known for building canals and promoting agriculture but did not capture Bukka and Harihara.

• Balban: Focused on consolidating the Delhi Sultanate but ruled before the fall of the Kakatiya Kingdom.

• Alauddin Khalji: Expanded the Delhi Sultanate significantly, but his campaigns did not involve Bukka and Harihara.

• Significance of the Kakatiya Kingdom's fall:

• The fall marked the consolidation of the Delhi Sultanate's control over South India.

• This event indirectly led to the establishment of the Vijayanagara Empire, which changed the political dynamics of the region.

• Legacy of Vijayanagara Empire:

• Renowned for the architectural marvels like Hampi, a UNESCO World Heritage Site.

• The empire played a crucial role in preserving South Indian traditions and resisting foreign invasions.

Q4. Answer: (d) Andes

The correct answer is Andes.

Key Points

• The Andes Mountains are the longest continental mountain range in the world, stretching approximately 7,000 kilometers across the western coast of South America.

• They run through seven South American countries: Venezuela, Colombia, Ecuador, Peru, Bolivia, Chile, and Argentina.

• The Andes are known for their high peaks, including Mount Aconcagua, which is the highest peak in South America at an elevation of 6,960.8 meters (22,837 feet) above sea level.

• This mountain range is also famous for its rich biodiversity and is home to a variety of flora and fauna, including the Andean condor and the vicuña.

• The Andes have significant geological activity, with numerous active volcanoes such as Cotopaxi and Osorno, and are a part of the Pacific Ring of Fire.

Additional Information

• Rockies:

• The Rocky Mountains, commonly known as the Rockies, are a major mountain range in North America.

• They stretch from British Columbia in Canada to New Mexico in the United States.

• The highest peak in the Rockies is Mount Elbert, located in Colorado, with an elevation of 4,401 meters (14,440 feet).

• Alps:

• The Alps are a major mountain range located in Europe.

• They extend across eight countries, including France, Switzerland, Italy, and Austria.

• The highest peak in the Alps is Mont Blanc, which stands at 4,808 meters (15,774 feet).

• Vosges:

• The Vosges Mountains are a low mountain range located in eastern France.

• They are part of the larger European mountain system and are known for their gently rounded summits, called ballons.

• The highest peak is Grand Ballon, with an elevation of 1,424 meters (4,672 feet).

• Andes:

• The Andes play a crucial role in the climate and geography of South America, influencing weather patterns and creating diverse ecosystems.

• They are home to ancient civilizations, such as the Incas, who built remarkable structures like Machu Picchu.

• The Andes are rich in natural resources, including copper, silver, tin, and gold, making them an important economic region.

Important Points

• The Andes are divided into three main sections:

• The Northern Andes, which are located in Venezuela, Colombia, and northern Ecuador.

• The Central Andes, which span central Ecuador, Peru, and western Bolivia.

• The Southern Andes, extending through southern Chile and Argentina.

• The Andes are characterized by a series of high plateaus and fertile valleys, making them suitable for agriculture and settlement.

• The Andes are also known for their diverse climate zones, ranging from tropical rainforests to snow-capped peaks, supporting a wide variety of ecosystems and wildlife.

• Some of the world's most famous trekking routes, such as the Inca Trail, are located in the Andes, attracting thousands of tourists each year.

Q5. Answer: (c) Anuradha Roy

The correct answer is Anuradha Roy.

Key Points

• Anuradha Roy is a renowned author and novelist from India, known for her evocative prose and deep exploration of human emotions and relationships.

• Her book, 'The Himalaya in a Small House', published in 2025, provides an intimate portrayal of life in a Himalayan village.

• The novel is celebrated for its rich descriptions of the Himalayan landscape and the lives of the people residing in the region.

• Roy's work often delves into themes of identity, displacement, and connection to nature, making her a prominent voice in contemporary Indian literature.

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• Her previous works, such as 'Sleeping on Jupiter' and 'The Folded Earth', have garnered critical acclaim for their storytelling and thematic depth.

Additional Information

• Anuradha Roy:

• Anuradha Roy is an Indian author whose works focus on themes such as social issues, personal relationships, and environmental concerns.

• She has won several awards, including the D.S.C. Prize for South Asian Literature and the Man Booker Prize nomination for her novels.

• Roy's writing is characterized by its lyrical quality and keen observation of human behaviors and cultural nuances.

• Himalayan Culture:

• The Himalayas are a cultural hub, home to various indigenous communities, traditions, and practices.

• Books like 'The Himalaya in a Small House' offer insights into the everyday lives of the people living in this unique geographic location.

• Himalayan villages often have a lifestyle deeply rooted in nature and spirituality, reflecting a harmonious coexistence with their environment.

• Literary Exploration of Nature:

• Authors like Anuradha Roy explore nature as a central theme in their works to emphasize its influence on human lives.

• Books set in the Himalayas often focus on themes of preservation, climate change, and human connection to the environment.

• Such literary works contribute to raising awareness about environmental conservation and the importance of safeguarding natural landscapes.

• Other Prominent Authors:

• Amitav Ghosh: Known for his exploration of history and climate change, but not associated with this book.

• Ruskin Bond: Famous for his Himalayan writings, yet he is not the author of 'The Himalaya in a Small House'.

• Namita Gokhale: Her work often focuses on Indian culture and heritage but does not include this specific book.

• Anuradha Roy: She is the correct answer, as this book is a part of her literary contributions.

Q6. Answer: (b) Banni grasslands

The correct answer is Banni Grasslands.

Key Points

• The Banni Grasslands, located in the state of Gujarat, India, have been approved as the site for India’s first cheetah conservation breeding centre in 2024.

• The Banni Grasslands are recognized as one of the largest grassland ecosystems in India and are located near the Rann of Kutch.

• The decision to establish the breeding centre in the Banni Grasslands was taken by the Central Zoo Authority (CZA), which oversees the management of zoos and breeding centres in India.

• This breeding centre aims to support and strengthen the population of cheetahs reintroduced to India after being extinct in the wild in the country for over 70 years.

• The Banni Grasslands are ecologically suitable for cheetahs due to their vast open landscapes, prey availability, and semi-arid climate, which mimic the natural habitat of cheetahs.

Additional Information

• Cheetah Reintroduction in India:

• Cheetahs were declared extinct in India in 1952 due to habitat loss, hunting, and lack of prey.

• The project to reintroduce cheetahs in India began with the release of eight African cheetahs into Kuno National Park, Madhya Pradesh, in 2022 under the Project Cheetah.

• The breeding centre at Banni Grasslands will act as a hub for the conservation of cheetahs and ensure their long-term survival in the country.

• Banni Grasslands:

• These grasslands cover around 2,618 square kilometers in the Kachchh district of Gujarat.

• The Banni Grasslands are known for their rich biodiversity, including a variety of grasses, shrubs, and wildlife.

• They serve as grazing land for livestock and are home to several species of birds and mammals.

• Role of Central Zoo Authority (CZA):

• The Central Zoo Authority (CZA) is a statutory body under the Ministry of Environment, Forest and Climate Change in India.

• It is responsible for the regulation and oversight of zoos and conservation breeding centres to ensure the protection of endangered species.

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• Importance of Cheetah Conservation:

• As the fastest land animal, cheetahs are an important part of the ecosystem, helping maintain the balance of prey populations.

• The conservation of cheetahs in India aims to restore ecological balance and biodiversity in the areas where they are reintroduced.

Important Points

• Other Options:

• Gandhi Sagar Wildlife Sanctuary: Located in Madhya Pradesh, it is known for its rich biodiversity and presence of various animal species, but it is not designated for cheetah conservation.

• Bandhavgarh National Park: Also located in Madhya Pradesh, this park is known for its tiger population and historical significance but is not associated with cheetah conservation.

• Tadoba National Park: Situated in Maharashtra, it is a prominent tiger reserve and does not serve as a cheetah conservation breeding centre.

• The cheetah reintroduction initiative is being supported by the National Tiger Conservation Authority (NTCA) and the Wildlife Institute of India (WII), alongside international collaborations.

• The project also aims to raise awareness about the importance of conserving endangered species and their habitats in India.

Q7. Answer: (b) Goa

The correct answer is Goa.

Key Points

• According to the Census of India 2011, Goa emerged as the most urbanized state in India, with 62.17% of its population residing in urban areas.

• This high level of urbanization in Goa is attributed to its status as a major tourist destination, strong infrastructure, and a well-developed service sector.

• The state has a relatively small geographical area and population, making governance and urban management more efficient compared to larger states.

• Goa's economy is primarily driven by tourism, mining, and exports, which have necessitated the development of urban amenities and infrastructure.

• In contrast to Goa, other states like Kerala (47.7%), Punjab (37.5%), and Haryana (34.9%) have lower urbanization levels as per the 2011 Census.

Additional Information

• Urbanization in India:

• Urbanization refers to the increase in the proportion of people living in urban areas compared to rural areas.

• As per the Census of India 2011, the urban population in India stood at 31.16%, an increase from 27.81% in 2001.

• Goa's Urban Characteristics:

• Goa's urban development is supported by its high literacy rate (87.4%), contributing to a more skilled workforce and better infrastructure planning.

• Its capital city, Panaji, and its commercial hub, Margao, are prominent urban centers with well-developed amenities.

• Other States' Urbanization Levels:

• Kerala: Though known for high human development indicators, Kerala is not as urbanized, with 47.7% urban population.

• Punjab: With 37.5% urbanization, Punjab's economy is largely agrarian, with slower urban growth compared to Goa.

• Haryana: Haryana has 34.9% urbanization, with industrial hubs like Gurgaon and Faridabad contributing to urban development.

• Factors Driving Urbanization:

• Economic opportunities, better infrastructure, and lifestyle amenities are primary drivers of urbanization.

• States like Goa benefit from their small size and focused economic activities, which facilitate faster urban growth.

Important Points

• Census of India: Conducted every 10 years, the Census provides crucial data on population, urbanization, and socio-economic indicators.

• Urban Growth in India: States like Maharashtra, Tamil Nadu, and Gujarat also show significant urbanization, driven by industrialization and economic development.

• Urban Challenges: Rapid urbanization often leads to issues like overcrowding, pollution, and inadequate infrastructure, which require sustainable planning and governance.

Q8. Answer: (d) Western Coastal Plain

The correct answer is Western Coastal Plain.

Key Points

• The Western Coastal Plain is a narrow stretch of land situated between the Western Ghats and the Arabian Sea, extending from Gujarat to Kerala.

• It comprises three distinct sections: the Konkan Coast (Maharashtra-Goa), the Kannada Coast (Karnataka), and the Malabar Coast (Kerala).

• The region is characterized by fertile soil, extensive coconut plantations, and prominent backwaters in areas like Kerala, contributing significantly to India's agriculture and tourism.

• The Western Coastal Plain is known for its natural harbors such as the Mumbai port, and it also serves as a hub for fishing and maritime activities.

• It has a tropical climate, with heavy monsoon rainfall and a diverse ecosystem, including mangrove forests and unique flora and fauna.

Additional Information

• Malwa Plateau:

• The Malwa Plateau is located in central India, primarily in Madhya Pradesh and Rajasthan.

• It is known for its black soil, ideal for cotton cultivation.

• The region is bounded by the Aravalli Hills to the northwest and the Vindhya Range to the south.

• This plateau is famous for its historical significance, including cities like Ujjain and Mandu.

• It does not lie between the Western Ghats and the Arabian Sea.

• Deccan Plateau:

• The Deccan Plateau covers a large portion of southern India, surrounded by the Eastern and Western Ghats.

• It is known for its volcanic soil (Deccan Traps) and significant mineral resources such as iron ore and coal.

• The plateau is home to many rivers, including the Godavari, Krishna, and Kaveri, which flow eastward into the Bay of Bengal.

• While the Deccan Plateau encompasses the Western Ghats, it does not specifically lie between the Western Ghats and the Arabian Sea.

• Eastern Coastal Plain:

• The Eastern Coastal Plain is a broad strip of land along the eastern coast of India, situated between the Eastern Ghats and the Bay of Bengal.

• It includes regions like the Coromandel Coast (Tamil Nadu) and the Northern Circars (Andhra Pradesh-Odisha).

• The area has fertile deltas formed by rivers such as the Mahanadi, Godavari, Krishna, and Kaveri.

• It does not lie between the Western Ghats and the Arabian Sea.

• Western Coastal Plain:

• It stretches from Gujarat in the north to Kerala in the south and lies directly between the Western Ghats and the Arabian Sea.

• The plain is narrower compared to the Eastern Coastal Plain, with a width ranging from 50 to 100 km.

• It is divided into sub-regions such as the Konkan, Malabar, and Kannada coasts, each with distinct geographical and cultural features.

• The Western Coastal Plain is crucial for India's agriculture, fishing, tourism, and trade, owing to its fertile lands and natural harbors.

Important Points

• Western Ghats:

• The Western Ghats, also known as the Sahyadri Hills, are a UNESCO World Heritage site known for their biodiversity and significance as a water source for peninsular rivers.

• They act as a climatic barrier, causing heavy rainfall in the coastal regions during the monsoon season.

• These ranges form the western boundary of the Deccan Plateau and separate it from the Western Coastal Plain.

• Arabian Sea:

• The Arabian Sea forms India's western coastline, hosting important ports like Mumbai, Kochi, and Mangalore.

• It is a vital route for international trade and maritime activities.

• The sea is bordered by India, Pakistan, Iran, and the Arabian Peninsula.

Q9. Answer: (d) Rashtrakutas

The correct answer is Rashtrakutas.

Key Points

• The Kailasa Temple at Ellora is one of the largest rock-cut ancient Hindu temples and is dedicated to Lord Shiva.

• It was constructed during the reign of the Rashtrakuta dynasty, specifically under King Krishna I, in the 8th century CE.

• This temple is renowned for its architectural brilliance, as it was carved out of a single piece of rock, showcasing the exceptional skill and craftsmanship of that era.

• The temple is part of the Ellora Caves, a UNESCO World Heritage Site, and represents a blend of religious harmony as the site includes Hindu, Buddhist, and Jain cave temples.

• The Rashtrakutas were known for their patronage of art and architecture, and the Kailasa Temple stands as a testament to their contributions to Indian cultural heritage.

Additional Information

• Rashtrakuta Dynasty:

• The Rashtrakutas ruled large parts of the Indian subcontinent between the 6th and 10th centuries CE.

• They were known for their military strength, administrative capabilities, and patronage of art and literature.

• Their kingdom extended from the Deccan Plateau to parts of Northern and Southern India.

• Kailasa Temple:

• The Kailasa Temple is dedicated to Lord Shiva and represents Mount Kailash, Shiva's abode.

• It was carved using a top-down approach, which means the artisans started from the top of the rock and worked their way downward.

• The temple features intricate carvings of deities, animals, and mythological scenes, including depictions from the Ramayana and Mahabharata.

• Ellora Caves:

• The Ellora Caves are located in the state of Maharashtra, India, and comprise 34 caves representing Hinduism, Buddhism, and Jainism.

• They were excavated between the 6th and 10th centuries CE.

• The site reflects India's historical religious harmony and the coexistence of multiple faiths.

• Architectural Features:

• The Kailasa Temple is approximately 276 feet long, 154 feet wide, and 90 feet high.

• It is entirely carved out of volcanic basalt rock, making it one of the largest monolithic structures in the world.

• The temple's design and carvings exhibit advanced engineering and artistic skills of the time.

Important Points

• Krishna I:

• He was one of the most notable rulers of the Rashtrakuta dynasty and reigned from 756 to 774 CE.

• Under his rule, the construction of the magnificent Kailasa Temple was undertaken, showcasing the dynasty's dedication to Hinduism and cultural excellence.

• Cholas:

• The Chola dynasty was renowned for its contributions to temple architecture, especially in Tamil Nadu, such as the Brihadeshwara Temple.

• They were not associated with the construction of the Kailasa Temple.

• Chalukyas:

• The Chalukyas were known for their rock-cut temples, such as those at Badami and Aihole.

• However, they were not responsible for the construction of the Kailasa Temple.

• Pallavas:

• The Pallava dynasty is credited with the creation of the rock-cut temples of Mahabalipuram in Tamil Nadu.

• They did not play a role in the construction of the Kailasa Temple at Ellora.

Q10. Answer: (a) Aam Aadmi Party

The correct answer is Aam Aadmi Party.

Key Points

• Harbhajan Singh, a former Indian cricketer, has transitioned into politics and represents the Aam Aadmi Party (AAP) in the Rajya Sabha as of May 2025.

• Harbhajan Singh was nominated by the Aam Aadmi Party for his contributions to public welfare and his influence as a public figure.

• The Aam Aadmi Party, led by Arvind Kejriwal, primarily focuses on governance reforms, anti-corruption measures, and public welfare policies, which resonated with Harbhajan Singh's vision of serving the public.

• The Rajya Sabha, also known as the Upper House of Parliament in India, is where Harbhajan Singh represents his state and contributes to national-level policymaking.

• The Aam Aadmi Party has been actively expanding its political presence across India and seeks to bring individuals from diverse backgrounds, including sports, into governance roles.

Additional Information

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• Aam Aadmi Party (AAP):

• The Aam Aadmi Party was founded in November 2012 by Arvind Kejriwal and others, following the India Against Corruption movement.

• The party aims to promote transparency, accountability, and anti-corruption measures in governance.

• It has been particularly successful in Delhi, forming the government multiple times, and has been expanding its reach to other states like Punjab.

• The party emphasizes education, health, electricity, and water reforms as part of its governance model.

• It is recognized for its innovative policy initiatives and grassroots-level engagement with citizens.

• Harbhajan Singh:

• Born on 3 July 1980, Harbhajan Singh is one of India's most successful cricketers, known for his exceptional skills as an off-spinner.

• He has represented India in 103 Test matches, 236 ODIs, and 28 T20Is, securing numerous accolades throughout his cricket career.

• After retiring from international cricket, Harbhajan Singh ventured into politics to contribute to social welfare and development.

• His association with the Aam Aadmi Party reflects his interest in public service and governance.

• Rajya Sabha:

• The Rajya Sabha, or Council of States, is the Upper House of India's Parliament.

• It consists of 250 members, with representatives elected by the legislative assemblies of states and union territories.

• The Rajya Sabha plays a crucial role in reviewing legislation and representing the interests of states at the national level.

• Members serve for a term of 6 years, with one-third of the body retiring every two years.

• Other Political Parties in India:

• Bharatiya Janata Party (BJP): India’s ruling party since 2014, known for its focus on nationalism, economic reforms, and development initiatives.

• Indian National Congress (INC): One of India’s oldest political parties, traditionally known for its focus on secularism and social justice.

• Shiromani Akali Dal (Badal): A regional party mainly active in Punjab, focusing on Sikh issues and agricultural policies.

• India has a multi-party system with national and regional parties representing diverse ideologies and agendas.

Important Points

• Political Representation:

• Sports personalities like Harbhajan Singh entering politics signify the increasing diversity in political representation in India.

• Such individuals bring a unique perspective and connect with youth and communities through their fame and achievements.

• Role of Rajya Sabha:

• The Rajya Sabha ensures state-level interests are represented at the national level and plays a crucial role in legislative processes.

• Members like Harbhajan Singh contribute to the legislative discussions and policymaking, ensuring a broader range of perspectives.

Q11. Answer: (d) Alt + Tab

The correct answer is Alt + Tab.

Key Points

• The Alt + Tab shortcut key is used to switch between open applications in the Windows operating system. This feature is called Task Switching.

• By pressing and holding the Alt key and then pressing the Tab key, users can cycle through the thumbnails of all currently open applications to quickly choose the desired one.

• This functionality enhances productivity by allowing users to navigate between multiple programs and windows efficiently, without using a mouse.

• The Alt + Tab feature has been part of Microsoft Windows since its early versions and is widely recognized as a core keyboard shortcut for multitasking.

• When users hold the Alt key and repeatedly press Tab, they can scroll through the list of running applications until the desired window is highlighted, and releasing the keys will bring that window to the foreground.

Additional Information

• Alt + Ins:

• This shortcut is not used for switching between applications in Windows. Instead, it is used in specific software or environments, such as virtual machine consoles, to insert system commands or perform special operations.

• It has limited use and is not a widely recognized shortcut for multitasking.

• Alt + F4:

• This shortcut is used for closing the currently active window or application in Windows.

• It is a quick method to exit programs or shut down the system when no application windows are open.

• Alt + Del:

• This shortcut is not associated with switching between applications. It is used in specific contexts, such as deleting files or accessing advanced menus in some software environments.

• It does not serve the purpose of multitasking or task switching.

• Windows Task View:

• Introduced in Windows 10, Task View is another multitasking tool that allows users to view all open applications and virtual desktops.

• It can be accessed by pressing Win + Tab, which provides a more visual and detailed representation of open windows compared to Alt + Tab.

Important Points

• Multitasking:

• Keyboard shortcuts like Alt + Tab are essential for multitasking, enabling users to manage multiple applications quickly and efficiently.

• Such shortcuts improve workflow, saving time and reducing reliance on mouse navigation.

• Accessibility:

• These shortcuts are particularly beneficial for users with physical limitations, providing an efficient way to navigate the system without requiring extensive mouse movement.

• They are integral to the Windows accessibility features.

• Consistency Across Versions:

• The Alt + Tab shortcut has remained consistent across different versions of Windows, making it a dependable tool for users familiar with the system.

• Its functionality has been enhanced in newer versions of Windows, offering smoother transitions and better visual representation of open applications.

Q12. Answer: (a) Co-operative federalism

The correct answer is Co-operative federalism.

Key Points

• The Sarkaria Commission was established in 1983 by the Government of India to review the center-state relations and suggest reforms for enhancing cooperation between them.

• The commission focused on strengthening cooperative federalism, which emphasizes collaboration and mutual trust between the center and the states in India.

• It provided recommendations for maintaining a balance of power between the central and state governments, ensuring that both could work harmoniously towards national development.

• One of its key recommendations was the establishment of the Inter-State Council under Article 263 of the Indian Constitution, aimed at promoting dialogue and resolving disputes between the center and states.

• The commission also emphasized the need for consultations between the center and states before enacting laws on subjects in the concurrent list.

Additional Information

• Co-operative federalism:

• Cooperative federalism refers to a system where the center and the states work collaboratively to achieve national goals while respecting the autonomy of each level of government.

• It promotes shared responsibility and mutual trust between the center and states, ensuring effective governance and policy implementation.

• Examples include coordination in implementing national schemes like Swachh Bharat Mission, Digital India, and GST.

• Fiscal federalism:

• Fiscal federalism relates to financial relations between units of governments in a federal system.

• It involves the allocation of resources and revenue-sharing between the center and states, as guided by bodies like the Finance Commission.

• Examples include the Goods and Services Tax (GST), which ensures a unified tax regime across the country.

• Unitary federalism:

• Unitary federalism refers to a system where the central government holds significant authority, and states have limited

autonomy.

• India follows a quasi-federal structure, where the center has stronger powers compared to the states, especially during emergencies under Articles 352, 356, and 360.

• Competitive federalism:

• Competitive federalism promotes competition among states to attract investments and improve governance.

• It is a modern approach where states independently work to enhance their economic performance and attract businesses.

• Examples include states competing to rank higher in the Ease of Doing Business Index published by the Government of India.

Important Points

• The Sarkaria Commission emphasized the need for decentralization and greater autonomy for states while ensuring cooperation and unity within the federal structure.

• The establishment of the Inter-State Council has been an important step in resolving inter-state disputes and enhancing coordination between the center and states.

• While cooperative federalism is the ideal approach, India's federal structure also incorporates elements of unitary federalism, especially during times of national emergencies.

Q13. Answer: (b) Industrial licensing and quota system

The correct answer is Industrial licensing and quota system.

Key Points

• Liberalisation in 1991 aimed to eliminate the industrial licensing and quota system, which had restricted the growth and development of industries in India.

• The licensing system required businesses to obtain prior approval from the government to set up, expand, or diversify industries, creating bureaucratic hurdles.

• The quota system limited the production capacity of industries by prescribing fixed production levels, thus hindering economic growth.

• The 1991 reforms led to the removal of most of these restrictions, enabling industries to operate freely and efficiently, fostering competition and innovation.

• By reducing government control, liberalisation paved the way for private sector participation and foreign investment, accelerating India's economic growth trajectory.

Additional Information

• Industrial Licensing:

• Industrial licensing was introduced under the Industrial Policy Resolution of 1956, requiring businesses to obtain government approval for manufacturing activities.

• The licensing system aimed to regulate industrial growth but led to inefficiencies and corruption due to excessive bureaucratic control.

• The 1991 reforms abolished licensing for most industries except for sectors related to national security and strategic importance.

• Quota System:

• The quota system fixed production limits for industries, often leading to underutilization of resources and discouraging economies of scale.

• After liberalisation, industries were allowed to produce as per market demand, enhancing operational efficiency.

• Key Features of Economic Liberalisation:

• Reduction in import tariffs and removal of export restrictions.

• Privatisation of public sector enterprises to improve efficiency.

• Encouragement of foreign direct investment (FDI) by relaxing investment norms.

• Devaluation of the Indian currency to promote exports.

• Impact of Liberalisation:

• India experienced rapid economic growth post-1991, with an average GDP growth rate of around 6-7% annually.

• Increased competition led to better products and services for consumers.

• Improved global integration of the Indian economy, making India a significant player in international markets.

Important Points

• Other Elements of Liberalisation:

• Banking services: Banking sector reforms were introduced to enhance efficiency but were not the primary aim of liberalisation.

• Public sector employment: While privatisation impacted employment, the focus was on reducing government interference in industries.

• Agricultural subsidies: Agricultural reforms were separate from the 1991 industrial liberalisation efforts.

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• Key Figures:

• The economic reforms of 1991 were spearheaded by then Prime Minister P.V. Narasimha Rao and Finance Minister Dr. Manmohan Singh.

• Dr. Manmohan Singh's budget speech in July 1991 is considered a landmark in India's economic history.

Q14. Answer: (b) Assam, Meghalaya, Tripura and Mizoram

The correct answer is Assam, Meghalaya, Tripura and Mizoram.

Key Points

• Under Article 244(2) of the Constitution of India, the Sixth Schedule applies to the administration of tribal areas in the northeastern states of Assam, Meghalaya, Tripura, and Mizoram.

• The Sixth Schedule provides for the formation of Autonomous District Councils (ADCs) to govern tribal areas, ensuring their customs, governance, and land rights are protected.

• Each Autonomous District Council has legislative, administrative, and judicial powers over subjects such as land management, forest resources, village administration, and more.

• The provision emphasizes self-governance for distinct tribal communities to preserve their cultural and social practices.

• Other states listed in the options like Gujarat, Madhya Pradesh, Rajasthan, Chhattisgarh, Nagaland, Manipur, and Arunachal Pradesh are not covered under the Sixth Schedule. Hence, only the states listed in Option 2 are correct.

Additional Information

• Sixth Schedule of the Indian Constitution:

• Introduced to protect the rights and autonomy of tribal communities in the northeastern region of India.

• Provides for the establishment of Autonomous District Councils (ADCs) in tribal-majority areas, allowing them to govern independently.

• Each ADC has legislative, judicial, and financial powers, including the ability to collect taxes and manage resources.

• ADCs can make laws on land use, forest management, agriculture, water resources, and inheritance, among other subjects.

• States Covered Under the Sixth Schedule:

• Assam: Includes tribal areas such as Karbi Anglong, Dima Hasao, and the Bodoland Territorial Region (BTR).

• Meghalaya: Includes Khasi Hills, Garo Hills, and Jaintia Hills.

• Tripura: Includes the Tripura Tribal Areas Autonomous District Council.

• Mizoram: Includes Chakma, Lai, and Mara Autonomous District Councils.

• Difference Between Fifth and Sixth Schedule:

• The Fifth Schedule deals with the administration of tribal areas in states other than those in the northeast (e.g., Jharkhand, Chhattisgarh, Odisha).

• The Sixth Schedule is specifically for the administration of tribal areas in the northeastern states (Assam, Meghalaya, Tripura, and Mizoram).

• While the Fifth Schedule provides for a Tribes Advisory Council, the Sixth Schedule establishes Autonomous District Councils with significant legislative and administrative powers.

• Autonomous District Councils (ADCs):

• Each ADC comprises members elected by the people and some nominated by the Governor.

• ADCs have the authority to enact laws on land, forest management, and customary laws.

• They also have judicial powers to establish village courts for resolving disputes.

Important Points

• Historical Background:

• The Sixth Schedule was included in the Constitution based on the recommendations of the Bordoloi Committee, which was set up by the Constituent Assembly to address tribal issues in the northeast.

• The primary aim was to balance tribal autonomy with national unity.

• Governor's Role:

• The Governor of the state has special responsibilities under the Sixth Schedule, such as modifying the jurisdiction of ADCs and approving certain laws enacted by them.

• The Governor can also dissolve or reconstitute an ADC if necessary.

• Significance:

• The Sixth Schedule ensures that tribal communities can preserve their distinct identity, culture, and traditions.

• It provides a mechanism for self-governance and development while safeguarding land and resource rights.

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Q15. Answer: (a) 7

The correct answer is 7.

Key Points

• The International System of Units (SI), established in 1960, is based on a set of 7 mutually independent base quantities that form the foundation for all derived units.

• The 7 base quantities in the SI system are:

• Length (Unit: meter, Symbol: m)

• Mass (Unit: kilogram, Symbol: kg)

• Time (Unit: second, Symbol: s)

• Electric current (Unit: ampere, Symbol: A)

• Thermodynamic temperature (Unit: kelvin, Symbol: K)

• Amount of substance (Unit: mole, Symbol: mol)

• Luminous intensity (Unit: candela, Symbol: cd)

• Each of these base quantities is defined by a precise standard, ensuring consistency in scientific and engineering measurements worldwide.

• The definitions of these base quantities have been refined over time to align with the latest advancements in science and technology, ensuring their universal applicability and accuracy.

• The correct recognition and utilization of these base quantities are essential for the development of derived units, such as newton (force), joule (energy), and pascal (pressure).

Additional Information

• Redefinition of SI Units:

• In 2019, the definitions of four SI base units (kilogram, ampere, kelvin, and mole) were redefined based on fundamental physical constants.

• This redefinition ensured that the SI units are now defined by invariant constants of nature, such as the speed of light and the Planck constant.

• Derived Units:

• Derived units are combinations of base units that are used to measure other physical quantities.

• Examples include:

• Force: newton (N) = $kg \cdot m/s^2$

• Energy: joule (J) = $N \cdot m = kg \cdot m^2/s^2$

• Pressure: pascal (Pa) = $N/m^2 = kg/(m \cdot s^2)$

• Historical Background:

• The SI system evolved from the metric system, which was first introduced in France in the late 18th century.

• The 11th General Conference on Weights and Measures (CGPM) in 1960 officially adopted the SI system.

• Importance of the SI System:

• It provides a standardized framework for measurements in science, engineering, and commerce.

• The SI system is recognized and used worldwide, facilitating international trade and collaboration in scientific research.

Important Points

• Units Outside the SI System:

• While the SI system is the most widely used, some non-SI units are also in use, such as:

• Time: minute (min), hour (h), day (d)

• Energy: electronvolt (eV)

• Length: angstrom (Å)

• These units are often used in specific scientific or practical contexts but are not part of the SI base or derived units.

• Global Adoption:

• The SI system is used worldwide, with only a few countries, such as the United States, Myanmar, and Liberia, using other systems like the Imperial system in certain sectors.

Q16. Answer: (d) Kerala

The correct answer is Kerala.

Key Points

• The World Bank approved a loan of Rs. 2,424 crore to the Indian state of Kerala for improving the healthcare infrastructure.

• Kerala has been recognized as one of the states with advanced healthcare systems, but the loan aims to address challenges

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and upgrade facilities for better access and service delivery.

• The project includes initiatives to strengthen primary healthcare systems, enhance disease surveillance, and modernize hospitals in rural and urban areas of Kerala.

• Kerala's healthcare model is widely admired for its emphasis on preventive care, but the funding focuses on expanding tertiary care facilities and improving healthcare outcomes further.

• This loan aligns with the state government's efforts to enhance public healthcare infrastructure, especially post-pandemic recovery strategies.

Additional Information

• Kerala's Healthcare System:

• Kerala has one of the highest life expectancy rates in India and a low infant mortality rate due to its focus on public health systems.

• The state has been a pioneer in implementing healthcare reforms, including free healthcare services in government hospitals.

• Primary healthcare facilities in Kerala emphasize preventive care and community outreach programs.

• World Bank's Role in India:

• The World Bank has been a major financial institution supporting development projects in India, including healthcare, education, and infrastructure.

• Over the years, the World Bank has funded projects to improve health outcomes and reduce poverty in various states.

• Post-Pandemic Healthcare Challenges:

• The COVID-19 pandemic highlighted gaps in healthcare infrastructure in India, including in advanced states like Kerala.

• The loan is part of broader efforts to strengthen healthcare resilience and preparedness for future crises.

• State Comparisons:

• While states like Gujarat, Andhra Pradesh, and Rajasthan have made strides in healthcare, Kerala remains a leader due to its long-standing emphasis on public health and education.

• Kerala's literacy rate and awareness levels contribute to better health outcomes compared to other states.

Important Points

• World Bank Loan:

• The loan is part of a broader strategy to improve healthcare systems globally, with a focus on developing economies.

• The funds are typically allocated with objectives of system modernization, capacity building, and infrastructure development.

• Kerala's Public Health Initiatives:

• Kerala has implemented schemes like Kudumbashree for women empowerment and community healthcare initiatives.

• The state has a robust network of primary health centers, urban health clinics, and district hospitals.

• Healthcare Modernization:

• The funds will be used to enhance digital health records, telemedicine services, and healthcare accessibility in remote areas.

• Special attention will be given to building capacity for disaster management and controlling communicable diseases.

Q17. Answer: (a) Equality before the law

The correct answer is Equality before the law.

Key Points

• Article 14 of the Indian Constitution guarantees the Fundamental Right to "Equality before the law" and "Equal protection of the laws" within the territory of India.

• The phrase "Equality before the law" signifies that every individual is equal in the eyes of the law, irrespective of their religion, race, caste, sex, or place of birth. Hence, the correct answer is Equality before the law.

• The principle of "Equal protection of the laws" is derived from the American Constitution and ensures that individuals in similar circumstances are treated equally by the law.

• This article forms the foundation for the concept of the Rule of Law in India, which was borrowed from the British legal system.

• Article 14 also serves as a basis for challenging arbitrary or discriminatory actions by the government or other authorities.

Additional Information

• Equality before the Law:

• This principle is of British origin and ensures the absence of any special privileges for any individual or group.

• It mandates that all individuals, regardless of their position or status, are subject to the ordinary laws of the land.

• Equal Protection of the Laws:

• This clause, inspired by the American Constitution, emphasizes that the law shall apply equally to all individuals in similar situations.

• It promotes the idea of substantive equality, allowing the government to make special provisions for disadvantaged groups to

ensure fairness.

• Exceptions to Article 14:

• The President of India and Governors of States enjoy immunity from legal proceedings during their term of office for acts done in their official capacity.

• Article 361 of the Constitution provides this exception.

• Important Judgments:

• Maneka Gandhi v. Union of India (1978): The Supreme Court ruled that Article 14 is not confined to equality before the law but also prohibits arbitrary actions by the state.

• EP Royappa v. State of Tamil Nadu (1974): The court emphasized that equality is a dynamic concept and is antithetical to arbitrariness.

• Relation to Other Articles:

• Article 14 complements other Fundamental Rights such as Article 15 (prohibition of discrimination) and Article 16 (equality of opportunity in public employment).

Important Points

• Other Fundamental Rights:

• Right to Freedom of Religion (Option 2): Guaranteed under Articles 25-28, this right provides freedom of conscience and the right to freely profess, practice, and propagate religion. Incorrect as it is not part of Article 14.

• Prohibition of Child Labour (Option 3): Found under Article 24, this prohibits the employment of children below 14 years in hazardous work. Incorrect as it is not related to Article 14.

• Protection of Life and Personal Liberty (Option 4): This is guaranteed under Article 21 of the Constitution, ensuring the right to life and personal liberty. Incorrect as it is not under Article 14.

• Significance of Article 14:

• It is a fundamental principle in the Indian Constitution, ensuring a just and equitable legal system.

• It prevents discrimination and arbitrary actions by the state and acts as a safeguard for citizens' rights.

Q18. Answer: (c) ASCII – American Standard Code for Information Interchange – Encodes text in computers

The correct answer is ASCII – American Standard Code for Information Interchange – Encodes text in computers.

Key Points

• ASCII (American Standard Code for Information Interchange) is a character encoding standard used in computers and electronic devices to represent text.

• It uses 7 bits to encode characters, supporting 128 unique characters, including letters, numbers, punctuation marks, and control characters.

• ASCII is widely used in computer systems for encoding and exchanging text-based data, making it a fundamental element in the communication between systems and applications.

• This encoding standard is crucial for text data representation in programming, file systems, and communication protocols. Hence, this statement is correct.

• Other options provided in the question include incorrect matches for abbreviations and their applications, as explained below.

Additional Information

• CD – Compact Disk:

• A Compact Disk (CD) is a digital optical disc storage format introduced in the early 1980s.

• It is used to store and retrieve data, including audio, video, and computer files.

• However, a CD is not used for high-speed internet access, as mentioned in option 1, making the statement incorrect.

• ASCII – Automated Symbolic Code for Integrated Input:

• The abbreviation ASCII does not stand for Automated Symbolic Code for Integrated Input; this is incorrect.

• ASCII is associated with encoding text for computers, not converting images to code as stated in option 2.

• LAN – Large Area Network:

• LAN actually stands for Local Area Network, a network that connects computers within a limited geographical area, such as an office or home.

• It is not used for connecting computers across continents as mentioned in option 4. For such purposes, Wide Area Networks (WANs) are used. Therefore, this statement is incorrect.

• Relevance of ASCII:

• ASCII has been integral in the evolution of computer systems, allowing machines to communicate using a standardized set of characters.

• It laid the foundation for more advanced encoding systems like Unicode, which supports a much larger set of characters, including those from various languages worldwide.

Important Points

• ASCII's Key Features:

• Uses 7 bits, allowing representation of 128 characters.

• Includes control characters such as newline, tab, and backspace, in addition to printable characters.

• Limitations of ASCII:

• Limited to English characters, making it insufficient for global use.

• Led to the development of extended ASCII (8-bit) and later Unicode (16-bit or more).

• Applications:

• Used in programming languages for representing characters.

• Serves as a foundation for text-based communication in protocols like HTTP, FTP, and SMTP.

Q19. Answer: (b) Muqaddam

The correct answer is Muqaddam.

Key Points

• In Sher Shah Suri's administration, the official responsible for maintaining law and order in a village was the Muqaddam.

• The Muqaddam was a village headman who also acted as an intermediary between the village and the central administration.

• He ensured the implementation of administrative orders within the village, collected taxes, and maintained peace and order.

• The Muqaddam was also responsible for resolving minor disputes at the village level, acting as a local authority figure in the community.

• This position played a critical role in Sher Shah's administrative structure, ensuring the stability and efficient governance of rural areas.

Additional Information

• Qazi:

• The Qazi served as a judicial officer in Sher Shah Suri's administration.

• He was responsible for administering justice according to Islamic law (Sharia) and resolving legal disputes.

• Qazis primarily worked in urban areas and were not directly responsible for maintaining law and order in villages.

• Shiqqdar:

• A Shiqqdar was an officer in charge of the district (Shiq) or a group of villages.

• He was responsible for maintaining law and order at the district level, supervising administrative operations, and ensuring the collection of revenue.

• While the Shiqqdar had a broader administrative role, the Muqaddam specifically handled law and order at the village level.

• Fotedar:

• The Fotedar was responsible for the treasury and accounts in Sher Shah's administration.

• His duties were primarily financial, and he did not have any role in maintaining law and order.

• This position was crucial for ensuring transparency and accountability in financial matters.

• Sher Shah's Administrative Reforms:

• Sher Shah Suri was known for his efficient and well-structured administrative system.

• He introduced centralized governance and divided the empire into administrative units for better management.

• His revenue system, road networks, and law enforcement policies laid the foundation for future Mughal administration.

Important Points

• Sher Shah's Revenue System: He introduced a standardized revenue system based on accurate land measurement and classification, ensuring fair tax collection.

• Road Infrastructure: Sher Shah built the famous Grand Trunk Road, connecting key trade and administrative centers, which enhanced communication and trade.

• Currency Reforms: Sher Shah introduced a uniform currency system, including the silver Rupiya, which became a standard for later administrations.

• Postal System: A systematic postal system was established for efficient communication throughout the empire.

Q20. Answer: (d) Rural areas

The correct answer is Rural areas.

Key Points

• The Sampoorna Grameen Rozgar Yojana (SGRY) was launched in September 2001 by merging two earlier schemes: the Employment Assurance Scheme (EAS) and the Jawahar Gram Samridhi Yojana (JGSY).

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• The primary focus of this scheme is on Rural areas, aiming to provide wage employment to the rural poor and create durable community assets.

• The scheme emphasizes the involvement of Panchayati Raj Institutions (PRIs) in planning and implementing projects, ensuring local participation and development.

• Under SGRY, wages are paid partly in cash and partly in kind (food grains), ensuring both income and food security for rural workers.

• The key beneficiaries of the scheme are individuals living below the poverty line in rural areas, with a special focus on women, Scheduled Castes (SCs), and Scheduled Tribes (STs).

Additional Information

• Objectives of Sampoorna Grameen Rozgar Yojana (SGRY):

• The scheme aims to provide additional wage employment in rural areas and ensure food security through the distribution of food grains.

• It focuses on creating durable and productive community assets like roads, irrigation canals, and school buildings in rural areas.

• Funding Mechanism:

• The scheme is funded by the Government of India and the respective state governments.

• The cost-sharing ratio between the Central and State governments is 75:25.

• Food grains are provided free of cost to the states by the Central government as part of the scheme.

• Implementation and Monitoring:

• The scheme is implemented through Panchayati Raj Institutions, which play a key role in identifying local needs and executing projects.

• Monitoring is conducted at the district, state, and central levels to ensure effective implementation and transparency.

• Target Beneficiaries:

• The scheme targets rural households, especially those living below the poverty line (BPL).

• Special emphasis is placed on providing employment opportunities to women, Scheduled Castes (SCs), and Scheduled Tribes (STs).

Important Points

• Significance of SGRY:

• SGRY contributes significantly to reducing rural unemployment and ensuring food security for vulnerable sections of society.

• The scheme also aids in rural development through the creation of durable assets, which improve infrastructure and living standards in villages.

• Transition to Other Schemes:

• In 2006, SGRY was subsumed under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which provides a legal guarantee for 100 days of wage employment to rural households.

• MGNREGA expanded on the objectives of SGRY by incorporating a rights-based approach to employment and ensuring transparency and accountability in implementation.

Q21. Answer: (d) Multi-Influence Ground Mine

The correct answer is Multi-Influence Ground Mine.

Key Points

• The Multi-Influence Ground Mine is an advanced undersea weapon system designed to neutralize enemy naval assets. It is one of the most sophisticated mine systems developed for modern naval warfare.

• It was successfully trialed by the Indian Navy in May 2025, highlighting the country's advancements in indigenous defense technology and undersea warfare capabilities.

• This mine operates based on multiple influence parameters such as acoustic, magnetic, and pressure signatures, making it highly effective against a wide range of targets like submarines and surface ships.

• It enhances the capability of the Indian Navy in anti-submarine warfare and coastal defense, ensuring strategic maritime security in critical zones like the Indian Ocean Region (IOR).

• The development and deployment of such mines reflect India's focus on achieving self-reliance in defense technology under the ‘Make in India’ initiative.

Additional Information

• Multi-Influence Ground Mine:

• This mine uses multi-influence sensors to detect and classify targets based on their specific acoustic, magnetic, and pressure signatures.

• It can be deployed in shallow or deep waters, making it versatile for different maritime environments.

• These mines are equipped with programmable settings, allowing operators to tailor their activation criteria to specific threats.

• Significance of Undersea Defense Weapons:

• Undersea defense weapons like the Multi-Influence Ground Mine play a crucial role in safeguarding a nation's maritime borders.

• They act as a deterrent against enemy naval incursions and provide a tactical advantage in anti-access/area denial (A2/AD) strategies.

• Other Indian Naval Advancements:

• The Indian Navy has been focusing on enhancing its underwater warfare capabilities with assets like the INS Kalvari-class submarines and advanced torpedoes like Varunastra.

• Collaborations with nations such as Russia, France, and the US have also contributed to the development of indigenous defense technologies.

• 'Make in India' Initiative in Defense:

• Launched in 2014, the 'Make in India' initiative aims to transform India into a global design and manufacturing hub.

• In defense, it emphasizes indigenization of military equipment, reducing dependency on imports, and boosting domestic production capabilities.

• Projects like the Multi-Influence Ground Mine highlight the success of this initiative in the defense sector.

Important Points

• Comparison with Other Options:

• Deep-Sea Explosive: Generally refers to underwater explosives used for demolition tasks, not a specific naval defense weapon.

• Hydro Depth Torpedo: Likely a reference to torpedoes used against deep-sea targets; however, it does not align with the trialed weapon.

• Submarine Neutralizer: Refers to systems designed specifically to disable submarines, but it is not the correct answer here.

Q22. Answer: (a) Communal tensions and political disagreements

The correct answer is Communal tensions and political disagreements.

Key Points

• Communal tensions were a major factor leading to the Partition of India in 1947. Historical animosities between Hindus and Muslims were fueled by divisive politics, leading to widespread mistrust and violence.

• The Two-Nation Theory, proposed by the All-India Muslim League under the leadership of Mohammad Ali Jinnah, advocated for the creation of a separate Muslim state due to the belief that Hindus and Muslims could not coexist peacefully. This was a pivotal ideological foundation for Partition.

• Political disagreements between the Indian National Congress (INC) and the Muslim League further deepened the divide. While the INC advocated for a united India, the Muslim League pushed for the creation of Pakistan.

• The rise in communal riots and violence, particularly during the Direct Action Day in 1946, showcased the deep-seated tensions and made Partition seem inevitable as a solution to halt the bloodshed.

• The Mountbatten Plan of June 3, 1947, proposed the division of British India into India and Pakistan, which was accepted by both INC and the Muslim League, thereby formalizing the Partition.

Additional Information

• Two-Nation Theory:

• This theory was based on the idea that Hindus and Muslims were two distinct nations with their own customs, religion, and traditions, and therefore, they could not coexist peacefully.

• It was strongly advocated by Mohammad Ali Jinnah, the leader of the Muslim League, who argued that Muslims needed a separate homeland to ensure their cultural and religious practices.

• Role of British Administration:

• The divide-and-rule policy adopted by the British exacerbated communal tensions between Hindus and Muslims.

• By supporting the Muslim League and limiting the influence of INC, the British contributed to the political disagreements that ultimately led to Partition.

• Impact of World War II:

• The economic strain and weakening grip of Britain following World War II made it difficult for the colonial power to manage India effectively.

• As a result, the British government expedited the process of granting independence to India, leading to the rushed Partition of the country.

• Partition of Bengal (1905):

• The seeds of communal division were sown during the Partition of Bengal in 1905, carried out by Lord Curzon.

• This division was seen as a deliberate attempt to split the Hindu and Muslim populations of Bengal, laying the groundwork for future communal tensions.

• Consequences of Partition:

• The Partition led to the creation of two independent nations, India and Pakistan, on August 15, 1947, and August 14, 1947, respectively.

• It resulted in one of the largest migrations in human history, with an estimated 15 million people displaced and approximately 1-2 million deaths due to communal violence.

• The political and cultural landscape of South Asia was irrevocably altered as a result of Partition.

Important Points

• Direct Action Day:

• Also known as the Great Calcutta Killings, it occurred on August 16, 1946, following the call for protests by the Muslim League.

• The day witnessed widespread communal violence in Calcutta, further solidifying the demand for Pakistan.

• Mountbatten Plan:

• Proposed by Lord Louis Mountbatten, the last Viceroy of India, it outlined the steps for the Partition of British India.

• The plan included provisions for dividing the country based on religious lines and allowing princely states to choose between India and Pakistan.

• Radcliffe Line:

• The boundary demarcation line between India and Pakistan was drawn by Cyril Radcliffe.

• It was finalized on August 17, 1947, two days after the independence of India and Pakistan.

Q23. Answer: (a) Krishna river

The correct answer is Krishna River.

Key Points

• Krishna River is one of the major rivers of the Peninsular Plateau in India.

• The Krishna River originates from the Western Ghats near Mahabaleshwar in Maharashtra and flows through Maharashtra, Karnataka, Telangana, and Andhra Pradesh.

• The river is approximately 1,400 km long and is the fourth-largest river in India in terms of water flow.

• The river supports agriculture and is a key source of irrigation for crops like rice, sugarcane, and cotton in the region.

• The Krishna River basin includes major dams such as the Srisailam Dam and Nagarjuna Sagar Dam, contributing to water management and hydroelectric power generation.

Additional Information

• Lohit River:

• The Lohit River is a tributary of the Brahmaputra River and flows through the northeastern region of India, mainly in Arunachal Pradesh.

• It originates from the eastern Himalayas in Tibet and is known for its swift currents.

• The Lohit River is not part of the Peninsular Plateau but is significant for the ecology and hydrology of the Brahmaputra basin.

• Beas River:

• The Beas River flows in the northern part of India, primarily in Himachal Pradesh and Punjab.

• It originates from the Himalayas near Rohtang Pass and is a tributary of the Indus River.

• Being part of the northern river system, it does not belong to the Peninsular Plateau.

• Dibang River:

• The Dibang River is another tributary of the Brahmaputra River and flows through Arunachal Pradesh.

• It originates from the Mishmi Hills in the Himalayas and has a steep gradient with high water velocity.

• Since it belongs to the northeastern region, it does not form part of the Peninsular Plateau.

• Peninsular Plateau Rivers:

• Rivers originating in the Peninsular Plateau include Godavari, Krishna, Kaveri, and Narmada.

• These rivers are generally seasonal, depending significantly on monsoon rainfall.

• Unlike the northern Himalayan rivers, these rivers do not carry perennial snowmelt water.

Important Points

• Peninsular Plateau:

• The Peninsular Plateau is one of the oldest landforms in India and consists of hard igneous and metamorphic rocks.

• It is characterized by flat-topped hills and valleys and is divided into the Central Highlands and the Deccan Plateau.

• Rivers originating from this plateau flow eastward into the Bay of Bengal, except for rivers like Narmada and Tapi, which flow westward.

• Rivers of India:

• India has a diverse river system categorized into Himalayan Rivers and Peninsular Rivers.

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• Himalayan rivers are snow-fed and perennial, while Peninsular rivers are rain-fed and seasonal.

Q24. Answer: (b) He became the 1st Indian athlete to surpass the 90-metre mark in javelin throw.

The correct answer is He became the 1st Indian athlete to surpass the 90-metre mark in javelin throw..

Key Points

• Neeraj Chopra, an Indian javelin thrower, achieved a historic milestone by surpassing the 90-metre mark at the Doha Diamond League 2025, a feat no other Indian athlete has accomplished before.

• This achievement cements Neeraj's status as one of the greatest Indian athletes, showcasing his consistent excellence in international competitions.

• The 90-metre mark in javelin throw is considered a benchmark of elite performance, and achieving this places Neeraj among the world's best javelin throwers.

• He already held the distinction of being India's first Olympic gold medalist in athletics, which he won at the Tokyo Olympics 2021.

• Neeraj's throw in Doha adds another layer of prestige to his career, propelling Indian athletics to new heights on the global stage.

Additional Information

• Historical Significance of Neeraj Chopra:

• Neeraj became the first Indian track-and-field athlete to win a gold medal in the Olympics during the Tokyo 2021 Olympics, with a throw of 87.58 metres.

• He has also won medals in other international competitions, such as the Asian Games and the Commonwealth Games.

• He is a recipient of prestigious awards like the Major Dhyan Chand Khel Ratna Award and the Arjuna Award.

• Importance of the 90-Metre Mark in Javelin Throw:

• The 90-metre mark is regarded as the gold standard in javelin throw, achieved only by a select few elite athletes globally.

• Throwing beyond this mark requires a perfect combination of technique, strength, and precision.

• It is a benchmark for athletes aiming for world championships and Olympic medals.

• Neeraj Chopra's Global Competitors:

• Other world-class javelin throwers, such as Johannes Vetter (Germany), are known for their consistent performances beyond 90 metres.

• Neeraj's achievement brings him closer to competing at the same level as these global legends.

• Neeraj's Contribution to Indian Athletics:

• He has inspired a new generation of Indian athletes to aim for excellence in global competitions.

• His success has brought increased attention and investment into Indian track-and-field sports.

Important Points

• Other Indian Javelin Throwers:

• While Neeraj is the first to cross the 90-metre mark, athletes like Shivpal Singh and Annu Rani have also represented India in international javelin events.

• They have contributed to the rising prominence of javelin throw in Indian athletics.

• Global Achievements in Javelin:

• The current world record in men's javelin throw is held by Jan Železný of the Czech Republic, with a throw of 98.48 metres (achieved in 1996).

• In women's javelin throw, the record is held by Barbora Špotáková, also from the Czech Republic, with a throw of 72.28 metres.

Q25. Answer: (c) RuBisCO

The correct answer is RuBisCO.

Key Points

• RuBisCO (Ribulose-1,5-bisphosphate carboxylase/oxygenase) is widely regarded as the most abundant protein in the biosphere. It plays a critical role in the process of photosynthesis.

• This enzyme is responsible for fixing atmospheric carbon dioxide into organic molecules during the Calvin cycle in plants, algae, and cyanobacteria.

• RuBisCO is found in the chloroplasts of plants and other photosynthetic organisms. Its abundance is due to its essential role in photosynthesis and the massive biomass of photosynthetic organisms on Earth.

• Given its global presence and significance in the carbon cycle, RuBisCO is integral to sustaining life on Earth by contributing to the production of oxygen and organic material.

• While proteins like collagen, myosin, and GLUT-4 are important in animal systems, they do not come close to RuBisCO in terms of abundance globally.

Additional Information

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• Collagen:

• Collagen is a structural protein found predominantly in animals. It is the main component of connective tissues like tendons, cartilage, and skin.

• It provides strength and elasticity to tissues and is the most abundant protein in the human body, but not in the biosphere.

• Collagen is widely used in medical treatments, cosmetic products, and supplements.

• GLUT-4:

• GLUT-4 is a glucose transporter protein primarily found in muscle and fat tissues of animals.

• It plays a critical role in glucose uptake in response to insulin stimulation, thereby contributing to glucose metabolism.

• While important for regulating blood sugar levels, its abundance is limited to specific tissues in animals.

• Myosin:

• Myosin is a motor protein found in animal cells and is essential for muscle contraction and movement.

• It interacts with actin filaments to facilitate cellular motion and is abundant in muscles.

• Its abundance is restricted to the animal kingdom and does not match the global prevalence of RuBisCO.

• RuBisCO in detail:

• RuBisCO is a highly inefficient enzyme, making it necessary for plants to produce it in large quantities to sustain the rate of photosynthesis.

• It is estimated that RuBisCO constitutes up to 50% of the soluble protein in plant leaves.

• RuBisCO's dual functionality allows it to catalyze both carboxylation and oxygenation reactions, although the oxygenation reaction can lead to photorespiration, which is less efficient.

• Efforts are underway in scientific research to engineer RuBisCO for improved efficiency to enhance crop yields and carbon fixation.

Important Points

• Global significance: RuBisCO is critical for maintaining the Earth's carbon cycle by converting atmospheric CO2 into organic material.

• Biological diversity: RuBisCO is present across various organisms, including plants, algae, and cyanobacteria, making it universally significant.

• Research focus: Scientists are exploring genetic modifications to increase RuBisCO's efficiency, aiming to improve agricultural productivity and address climate change challenges.

• Environmental impact: RuBisCO indirectly contributes to oxygen production and serves as a cornerstone for ecosystems globally.

Q26. Answer: (c) 1904

The correct answer is 1904.

Key Points

• Lord Curzon, who served as the Viceroy of India from 1899 to 1905, is known for implementing various reforms in India, including educational reforms.

• The Indian Universities Act was passed in 1904 under Lord Curzon's administration to bring about significant changes in the functioning and structure of universities in India.

• The Act aimed to impose greater control and regulation over Indian universities, which were perceived to have become centers of nationalist activities.

• Key provisions of the Act included stricter state supervision, increasing the standard of education, and ensuring better management of universities.

• This Act led to widespread criticism from Indian leaders and educators, as it was seen as an attempt to curb academic freedom and nationalist sentiments in educational institutions.

Additional Information

• Lord Curzon's Reforms:

• Lord Curzon introduced several administrative reforms, including improvements in police, irrigation, and railways, alongside educational reforms.

• The Indian Universities Act, 1904, was intended to modernize and standardize higher education in India but was criticized for being authoritarian.

• He also established the Archaeological Survey of India to preserve India’s cultural heritage.

• Impact of the Indian Universities Act:

• The Act increased government control over universities, including appointments, curricula, and administration.

• It introduced measures to raise educational standards but also restricted academic autonomy.

• The Act was seen as an instrument to suppress nationalist movements within educational institutions.

• Educational Landscape in India (Pre-1904):
• Universities like Calcutta, Bombay, and Madras were established in 1857 but had limited government oversight.
• These universities were criticized for focusing more on examinations than on actual learning and research.
• Lord Curzon aimed to address these shortcomings through the Act but faced backlash for his approach.
• Reactions to the Act:
• The Act was opposed by prominent Indian leaders, including Gopal Krishna Gokhale, who viewed it as an attack on academic freedom.
• It fueled nationalist sentiments and contributed to the growing demand for self-governance.
• The Act is often considered a pivotal moment in the evolution of the Indian nationalist movement.

Important Points

• Indian Universities Act, 1904:
• This Act brought universities under more direct control of the colonial administration.
• It restricted the autonomy of universities, introduced stricter regulations, and increased state oversight.
• Lord Curzon's Legacy:
• While his reforms modernized certain aspects of governance, they were also seen as imperialistic and disregarding Indian sentiments.
• His policies, including the partition of Bengal in 1905, were highly controversial and sparked widespread resistance.
• Evolution of Education in India:
• Post-Curzon era saw increased efforts by Indian leaders to establish institutions that catered to nationalist aspirations, such as the Banaras Hindu University (1916).
• The Swadeshi Movement also emphasized the importance of education in fostering self-reliance and national pride.

Q27. Answer: (b) Azerbaijan

The correct answer is Azerbaijan.

Key Points

• Armenia signed a peace treaty with Azerbaijan in March 2025, ending decades of conflict centered around the Nagorno-Karabakh region.
• The peace treaty aimed to resolve territorial disputes and establish long-term stability in the region, which has been the focus of intense international mediation efforts.
• The Nagorno-Karabakh conflict is one of the most prolonged disputes, originating in the late 20th century, as the region was claimed by both Armenia and Azerbaijan.
• Previous efforts to establish peace included the 2020 ceasefire agreement, brokered by Russia, which temporarily halted hostilities but failed to resolve the underlying issues.
• The peace treaty in 2025 marked a significant diplomatic milestone, with both nations agreeing on terms for border recognition and economic cooperation.

Additional Information

• Armenia-Azerbaijan Relations:
• The conflict traces back to the Soviet era, when the Nagorno-Karabakh region, inhabited largely by ethnic Armenians, was assigned to Azerbaijan.
• Post-Soviet independence in the 1990s saw a war between Armenia and Azerbaijan, leading to massive displacement and thousands of casualties.
• Despite multiple attempts at negotiation, including efforts by the OSCE Minsk Group, a long-term solution remained elusive for decades.
• Impact of 2020 Conflict:
• In September 2020, renewed fighting erupted, resulting in significant military and civilian casualties.
• The Russia-brokered ceasefire in November 2020 resulted in Azerbaijan reclaiming territories it had lost in the earlier conflict.
• While the ceasefire brought temporary relief, unresolved tensions persisted, necessitating further negotiations.
• Geopolitical Importance:
• The Nagorno-Karabakh region is strategically significant due to its location in the South Caucasus, a crossroads between Europe and Asia.
• Regional powers like Russia, Turkey, and Iran have vested interests in the stability of the area, influencing diplomatic efforts.
• The peace treaty also opened avenues for economic cooperation, including energy transit and trade routes.
• Role of International Mediation:
• The OSCE Minsk Group, co-chaired by Russia, the United States, and France, has been actively involved in mediation efforts

since the 1990s.

• International organizations like the United Nations and the European Union have also advocated for peaceful resolution and humanitarian aid for displaced populations.

• The 2025 treaty was seen as a culmination of years of diplomacy and pressure from global stakeholders.

• Future Prospects:

• The treaty emphasized mutual respect for sovereignty and territorial integrity, setting a precedent for other conflict-ridden regions.

• Continued international support and monitoring are crucial to ensure the success of the agreement and prevent future hostilities.

• Efforts are underway to rebuild trust and foster economic partnerships between Armenia and Azerbaijan.

Q28. Answer: (a) Scheduled Areas and Scheduled Tribes

The correct answer is Scheduled Areas and Scheduled Tribes.

Key Points

• The Fifth Schedule of the Indian Constitution specifically deals with the administration and control of Scheduled Areas and Scheduled Tribes.

• It provides for the establishment of a Tribes Advisory Council in states having Scheduled Areas to ensure the welfare and advancement of Scheduled Tribes.

• The schedule empowers the Governor of a state to make regulations for the peace and good governance of Scheduled Areas after consulting the Tribes Advisory Council.

• Scheduled Areas are regions identified as socially and economically backward, inhabited predominantly by Scheduled Tribes, and require special attention for their development.

• The President of India has the authority to declare areas as Scheduled Areas and modify their boundaries as necessary.

Additional Information

• Scheduled Areas:

• Scheduled Areas are designated under the Fifth Schedule of the Constitution and primarily include regions with a significant tribal population.

• These areas are located in states such as Andhra Pradesh, Odisha, Madhya Pradesh, Chhattisgarh, Jharkhand, Gujarat, Maharashtra, Himachal Pradesh, and Rajasthan.

• The objective of declaring Scheduled Areas is to provide special governance and development measures for the welfare of tribal communities.

• Tribes Advisory Council:

• It is constituted under the Fifth Schedule to advise the Governor on matters related to the welfare and development of Scheduled Tribes.

• The council consists of members representing tribal communities, including elected representatives of the state legislature.

• It plays a pivotal role in ensuring the administration of Scheduled Areas aligns with the needs and aspirations of tribal populations.

• Governor's Powers:

• The Governor has special powers under the Fifth Schedule to make regulations concerning Scheduled Areas to ensure peace and governance.

• These regulations may include restricting the transfer of land by or among Scheduled Tribes and regulating money lending activities.

• However, such regulations require prior consultation with the Tribes Advisory Council.

• Constitutional Provisions:

• Articles 244(1) and 244(2) of the Constitution provide for the administration of Scheduled Areas and Tribal Areas.

• The Fifth Schedule applies to areas other than the Sixth Schedule, which is specific to Tribal Areas in states of Northeast India.

Important Points

• Declaration of Scheduled Areas:

• The President of India declares areas as Scheduled Areas based on tribal population density, social and economic backwardness, and geographical isolation.

• Changes in the boundaries of Scheduled Areas can also be made by the President after consulting the respective state governments.

• Special Laws:

• Special laws are enacted to protect the rights of Scheduled Tribes, such as the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

• These laws aim to safeguard tribal lands, resources, and traditional practices from exploitation.

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• Historical Context:

• The concept of Scheduled Areas and Tribes was introduced to address historical injustices and marginalization faced by tribal communities.

• It is a constitutional effort to integrate tribal populations into the mainstream while preserving their unique identity and rights.

Q29. Answer: (c) Cruelty by husband or his relatives towards a woman

The correct answer is Cruelty by husband or his relatives towards a woman.

Key Points

• Section 498A of the Indian Penal Code (IPC) deals with cruelty towards a married woman by her husband or his relatives.

• The term "cruelty" is defined under this section and includes any conduct that causes grave physical or mental injury to the woman or drives her to commit suicide.

• This section was introduced in 1983 to protect women from harassment and cruelty related to dowry demands, which were prevalent during that period.

• Under Section 498A, the offense is considered cognizable, non-bailable, and non-compoundable, emphasizing its seriousness.

• The punishment for cruelty under Section 498A includes imprisonment for up to 3 years and may also include a fine.

• Cases filed under Section 498A often pertain to domestic abuse, harassment, or dowry-related issues, making it a significant legal tool for safeguarding women's rights in India.

Additional Information

• Domestic Violence Act (2005):

• This act provides civil remedies for women facing abuse within their homes, including physical, emotional, sexual, and economic abuse.

• It allows women to file complaints and seek protection orders, residence orders, or monetary relief from the perpetrator.

• Dowry Prohibition Act (1961):

• This act prohibits the giving or receiving of dowry and penalizes those involved in dowry-related offenses.

• Dowry deaths are addressed under Section 304B of the IPC, which deals with unnatural deaths of women within 7 years of marriage due to dowry harassment.

• Role of Police and Judiciary:

• Cases under Section 498A require thorough investigation by police before charges are framed.

• The judiciary plays a crucial role in ensuring justice while preventing misuse of this provision, as concerns have been raised about false accusations.

• Other Sections of IPC:

• Section 304B: Addresses dowry deaths and prescribes a punishment of imprisonment for not less than 7 years and extending to life imprisonment.

• Section 306: Deals with abetment to suicide, which may overlap with cases of harassment under Section 498A.

Important Points

• Legal Safeguards:

• Section 498A provides protection for women but has also faced criticism for alleged misuse in some cases.

• To address concerns of misuse, the Supreme Court in various rulings suggested mediation and counseling as remedies before escalating the matter legally.

• Implementation Challenges:

• Lack of awareness among women, societal pressure, and stigma often prevent victims from seeking legal recourse.

• Proper training for police and legal professionals is essential for effective implementation of Section 498A.

• Statistics:

• According to the National Crime Records Bureau (NCRB), cruelty by husband and relatives is among the most reported crimes against women in India.

• Efforts to curb such crimes have been supplemented by community awareness programs and stricter enforcement of laws.

Q30. Answer: (b) Zojila Tunnel

The correct answer is Zojila Tunnel.

Key Points

• The Zojila Tunnel is set to become Asia's longest bi-directional tunnel upon its completion. It is located in the Union Territory of Ladakh, India, and connects Srinagar with Leh.

• The tunnel is part of the NH-1 project and is being constructed at an altitude of approximately 11,578 feet. It aims to provide year-round connectivity between Sonmarg in Jammu & Kashmir and Drass in Ladakh, which otherwise remains cut off during winter due to heavy snowfall.

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• The length of the Zojila Tunnel is approximately 13.14 kilometers, making it the longest road tunnel in Asia.

• The project is strategically important for the Indian government as it enhances connectivity in a region that is critical from both military and economic perspectives.

• Construction of the Zojila Tunnel began in 2020 and is expected to be completed by 2026, significantly improving access to Ladakh and boosting its socio-economic development.

Additional Information

• Pir Panjal Railway Tunnel (Banihal Tunnel):

• It is India's longest railway tunnel and was completed in 2013.

• Located in Jammu & Kashmir, the tunnel is 11.2 kilometers long and connects Banihal with Qazigund.

• This railway tunnel is part of the Jammu-Baramulla rail line project.

• Tike Tunnel:

• The Tike Tunnel is located in Maharashtra, India, and is part of the Konkan Railway network.

• It is much shorter compared to the Zojila Tunnel, measuring approximately 6.5 kilometers.

• Natuwadi Tunnel:

• Located in Maharashtra, this tunnel is part of the Konkan Railway.

• It spans a length of 4.3 kilometers and is known for its engineering marvel in a challenging terrain.

• Strategic Importance of Zojila Tunnel:

• The tunnel plays a key role in ensuring all-weather connectivity to the Ladakh region, which has significant strategic importance for India, especially given its proximity to the India-China border.

• It also supports economic development by improving access to remote areas and boosting tourism in Ladakh.

Important Points

• Construction Challenges:

• Constructing the Zojila Tunnel involves overcoming extreme weather conditions, including heavy snow, avalanches, and sub-zero temperatures.

• The project also requires advanced tunneling techniques due to the region's fragile geology.

• Economic Benefits:

• Once completed, the tunnel will reduce travel time between Srinagar and Leh by approximately 3-4 hours, significantly improving trade and tourism.

• Environmental Considerations:

• The project takes into account environmental concerns by implementing measures to minimize its ecological impact during construction.

Q31. Answer: (a) Vinegar

The correct answer is Vinegar.

Key Points

• Vinegar is commonly used in the kitchen as a preservative for pickles due to its high acidity.

• It contains acetic acid, which acts as a natural preservative by inhibiting the growth of harmful bacteria and fungi.

• Acetic acid lowers the pH of the food, creating an environment unsuitable for microbial growth, thus extending the shelf life of pickles.

• Vinegar is also used to enhance the flavor of pickles, providing a tangy and sour taste.

• In addition to preservation, vinegar can also act as a cleaning agent and is used in various culinary practices.

Additional Information

• Characteristics of Vinegar:

• Vinegar is produced through the fermentation of ethanol by acetic acid bacteria.

• Common types of vinegar include white vinegar, apple cider vinegar, balsamic vinegar, and malt vinegar, each having unique flavors and uses.

• It is widely used in cooking, preservation, and even medicinal practices due to its antimicrobial properties.

• Other Preservatives Used in Pickling:

• Salt: It helps draw out moisture from the vegetables and inhibits bacterial growth.

• Sugar: While primarily used for flavor, sugar can also act as a mild preservative by binding water and reducing microbial activity.

• Oil: Creates a protective layer that prevents air from coming into contact with the food, reducing spoilage.

• Health Benefits of Vinegar:

• Vinegar is known to aid in digestion, regulate blood sugar levels, and promote weight loss.

• Apple cider vinegar, in particular, is commonly consumed for its health benefits.

• Historical Use of Vinegar:

• Vinegar has been used for centuries as a preservative and flavoring agent.

• It was widely employed in ancient civilizations like the Romans and Greeks for food preservation and medicinal purposes.

Important Points

• Yeast: While yeast is used in fermentation processes, it is not suitable as a preservative for pickles because it promotes microbial activity rather than inhibits it.

• Baking Soda: Baking soda is primarily used as a leavening agent in baking and does not have preservative properties for pickling.

• Sugar: While it can act as a mild preservative, sugar is not as effective as vinegar in preventing microbial growth in pickles.

• Vinegar remains the most effective and widely used preservative for pickles due to its high acidity and antimicrobial properties.

Q32. Answer: (b) 2016

The correct answer is 2016.

Key Points

• The Real Estate (Regulation and Development) Act (RERA) was enacted in 2016 by the Indian Parliament to establish transparency and accountability in the real estate sector.

• RERA became effective on 1 May 2016, with the aim of regulating the real estate market and protecting the interests of homebuyers.

• The Act seeks to curb malpractices, delays, and frauds in the real estate industry, ensuring that developers deliver projects on time and meet promised standards.

• Under RERA, developers are required to register their projects with the Real Estate Regulatory Authority before advertising or selling, ensuring compliance with legal regulations.

• The Act provides a clear framework for resolving disputes between homebuyers and developers, offering a fast-track grievance redressal mechanism.

• Each state and union territory in India is mandated to establish its own Real Estate Regulatory Authority under RERA to monitor and regulate the real estate market.

Additional Information

• Objectives of RERA:

• To ensure transparency in real estate transactions and promote fair practices in the sector.

• To protect homebuyers from fraudulent activities and ensure timely delivery of projects.

• To establish a regulatory authority in each state to monitor the compliance of rules by developers and agents.

• To reduce litigation and provide a mechanism for efficient dispute resolution.

• Key Provisions of RERA:

• Developers must provide detailed project information, including layout, timeline, and costs.

• Builders cannot make any changes to the project without the consent of buyers.

• Homebuyers are entitled to compensation in case of project delays.

• Funds collected for a project must be kept in a separate escrow account to prevent misuse.

• Impact of RERA:

• Enhanced consumer confidence in the real estate market.

• Improved accountability and compliance among developers.

• Streamlined processes for property transactions and legal documentation.

• Boosted growth in the organized real estate sector.

• Historical Context:

• Before RERA, homebuyers faced issues like project delays, lack of transparency, and fraudulent practices by developers.

• The Indian government enacted RERA to address these challenges and create a more robust and reliable real estate industry.

Important Points

• RERA Coverage:

• The Act applies to residential and commercial properties, including apartments, plots, and buildings.

• Projects with an area of more than 500 sq. meters or more than 8 apartments must be registered under RERA.

• It includes provisions to regulate real estate agents, ensuring fair practices in property transactions.

• Penalties under RERA:

• Developers who fail to register their projects or comply with RERA norms are subject to monetary penalties and legal actions.

• Homebuyers have the right to seek compensation and legal recourse in case of violations.
• Implementation Challenges:
• Some states have been slow to implement RERA, leading to delays in achieving its objectives.
• Lack of awareness about RERA among stakeholders, including homebuyers and real estate agents, hampers its effectiveness.

Q33. Answer: (c) Chief Justice of High Court

The correct answer is Chief Justice of High Court.

Key Points

• The Governor of a state is appointed by the President of India, as per Article 155 of the Constitution of India.
• The oath of office to the Governor is administered by the Chief Justice of the High Court of the respective state, as per Article 159 of the Constitution.
• While taking the oath, the Governor swears to preserve, protect, and defend the Constitution and the law, and to faithfully discharge the duties of their office.
• This procedure ensures the constitutional legitimacy and accountability of the Governor's role in state administration.
• If the Chief Justice of the High Court is unavailable, the oath is administered by the senior-most judge of the High Court.

Additional Information

• Appointment of Governor:
• The Governor is appointed by the President of India under Article 155 of the Indian Constitution.
• The Governor holds office for a term of five years, but the tenure can be terminated earlier by the President or by resignation.
• The Governor's role is primarily ceremonial, but they also play a key role in ensuring the state government functions within the framework of the Constitution.
• Oath of Office:
• The oath emphasizes the Governor's commitment to upholding the Constitution and the rule of law.
• It is administered in the presence of the Chief Justice of the High Court to signify the constitutional importance of the office.
• This procedure is designed to ensure a smooth transition of power and adherence to constitutional principles.
• Responsibilities of the Governor:
• The Governor acts as the constitutional head of the state, with all executive actions taken in their name.
• They appoint the Chief Minister and other ministers, summon and prorogue the state legislature, and can dissolve the Legislative Assembly.
• The Governor has discretionary powers in certain situations, such as recommending President's Rule under Article 356.
• Relevant Constitutional Articles:
• Article 155: Deals with the appointment of the Governor.
• Article 159: Specifies the oath or affirmation taken by the Governor.
• Article 356: Allows the Governor to recommend President's Rule in case of constitutional failure in the state.
• Chief Justice of High Court:
• The Chief Justice of the High Court is the highest judicial authority in the state and plays a vital role in administering the oath to the Governor.
• They ensure the constitutional compliance of this ceremonial procedure.

Important Points

• Role of Governor:
• While the Governor is the constitutional head, the real power lies with the Council of Ministers headed by the Chief Minister.
• The Governor's role is primarily to ensure constitutional governance and act as a link between the state and central governments.
• Other Related Offices:
• The oath-taking process for other offices, such as the President of India, is conducted by the Chief Justice of India.
• Similarly, the oath for Members of Parliament is administered by the President or their representative.

Q34. Answer: (a) The Energy and Resource Institute (TERI)

The correct answer is The Energy and Resource Institute (TERI).

Key Points

• The World Sustainable Development Summit (WSDS) is an annual flagship event organized by The Energy and Resources Institute (TERI).
• The WSDS is a global platform that brings together heads of state, policymakers, industry leaders, and academicians to deliberate on pressing environmental and sustainability issues such as climate change, energy efficiency, and environmental

conservation.

• The summit typically focuses on addressing challenges related to sustainable development and finding practical solutions to ensure a sustainable future for the planet.

• The WSDS 2025 would continue its legacy of fostering global collaboration to combat climate change while promoting economic growth and sustainable development.

• TERI, headquartered in New Delhi, has a history of working on research and advocacy concerning energy, environment, and sustainable development since its establishment in 1974.

Additional Information

• The Energy and Resource Institute (TERI):

• TERI was established in 1974 and focuses on research in the fields of energy, environment, and sustainable development.

• It is headquartered in New Delhi, India, and has played a pivotal role in addressing global and local environmental challenges.

• TERI organizes various initiatives, including the annual WSDS, to promote dialogue and action on global sustainability issues.

• World Sustainable Development Summit (WSDS):

• The WSDS was started by TERI in 2001 and has since become one of the most prominent sustainability events globally.

• The summit focuses on topics such as climate resilience, renewable energy, green technology, and sustainable urbanization.

• It serves as a platform for multi-stakeholder discussions to address policy issues and solutions for sustainable development.

• Other Organizations Mentioned:

• Centre for Science and Environment (CSE): A public interest research and advocacy organization based in India, focusing on sustainable development issues and environmental research.

• National Institution for Transforming India (NITI Aayog): The premier policy think tank of the Indian government, aimed at fostering cooperative federalism and sustainable development.

• Research and Information System (RIS): A New Delhi-based autonomous policy research institute specializing in international economic development, trade, and investment.

Important Points

• Significance of WSDS:

• WSDS encourages global cooperation in addressing climate and sustainability challenges.

• The summit facilitates policy dialogues and partnerships among nations, industries, and research organizations.

• It contributes to the achievement of global sustainability goals, including the United Nations Sustainable Development Goals (SDGs).

• Key Themes of Previous WSDS:

• 2019: 'Attaining the 2030 Agenda: Delivering on Our Promise.'

• 2020: 'Towards 2030 Goals: Making the Decade Count.'

• 2021: 'Redefining Our Common Future: Safe and Secure Environment for All.'

• Role of TERI in Global Sustainability:

• TERI's efforts include promoting renewable energy, energy efficiency, and climate policy research.

• Its initiatives contribute towards achieving environmental conservation and combating climate change.

Q35. Answer: (c) France

The correct answer is France.

Key Points

• VARUNA is a bilateral naval exercise conducted between India and France. It reflects the strong maritime cooperation between both nations.

• The exercise was initiated in the year 1993 and was officially named "VARUNA" in 2001.

• The primary objective of VARUNA is to enhance interoperability and mutual understanding between the navies of India and France.

• This naval exercise encompasses a wide range of activities, including anti-submarine warfare, air defense, and maritime interdiction operations.

• It also serves as a platform for both navies to share their knowledge and expertise regarding advanced naval technologies and strategies.

Additional Information

• France:

• France is located in Western Europe and is renowned for its robust naval capabilities and advanced maritime technologies.

• The country has a well-equipped navy, including the French Navy (Marine Nationale), which is among the most advanced naval forces globally.

• France has been India's strategic defense partner for decades, contributing to various joint defense projects and exercises.
• It is a part of Quad discussions, highlighting its role in maritime security in the Indo-Pacific region.
• Other Countries in the Options:
• The US: India conducts naval exercises with the US under the framework of MALABAR. These exercises focus on multilateral collaboration in the Indo-Pacific region.
• South Korea: India and South Korea collaborate on various maritime security initiatives, but no major bilateral naval exercise like VARUNA exists between them.
• The UK: India and the UK conduct naval exercises under the name KONKAN. These exercises emphasize anti-submarine warfare and tactical operations.
• Importance of Naval Exercises:
• They strengthen defense cooperation and improve interoperability between nations.
• Naval exercises help address challenges like piracy, terrorism, and maritime security threats.
• They play a significant role in promoting peace and stability in critical maritime regions.
Important Points
• India-France Defense Collaboration:
• India and France share a strong defense partnership, including collaboration on Rafale fighter jets and Scorpene submarines.
• The partnership extends to counter-terrorism, cybersecurity, and space defense technologies.
• France supports India's Indo-Pacific strategy, ensuring a free, open, and inclusive maritime environment.
• VARUNA 2023 Highlights:
• The recent edition of VARUNA focused on advanced maritime operations in the Indian Ocean region.
• It saw participation from French aircraft carrier Charles de Gaulle and India's INS Vikramaditya.
• Activities included joint tactical maneuvers, replenishment at sea, and live weapon firing exercises.

Q36. Answer: (b) BJP won a majority, forming the government.

The correct answer is BJP won a majority, forming the government..
Key Points
• The 2025 Delhi Legislative Assembly elections marked a significant shift in the political landscape of Delhi, with the Bharatiya Janata Party (BJP) securing a majority.
• The BJP’s victory ended the long-standing dominance of the Aam Aadmi Party (AAP), which had ruled Delhi for over a decade.
• The BJP focused on issues such as infrastructure development, law and order, and national integration, resonating with voters across various demographics.
• The party's campaign strategy included leveraging social media platforms and conducting door-to-door outreach programs, ensuring widespread voter engagement.
• With this win, BJP formed the government, appointing a to lead Delhi's governance for the next five years.
Additional Information
• Aam Aadmi Party (AAP):
• The Aam Aadmi Party, under the leadership of Arvind Kejriwal, had ruled Delhi since 2015.
• AAP is known for its focus on, which appealed to the working-class voters.
• Despite losing the 2025 elections, AAP continues to hold a significant vote base in Delhi.
• Bharatiya Janata Party (BJP):
• The BJP, led by its, capitalized on nationalistic sentiments and promises of better governance to secure a victory in Delhi.
• It focused on and resolving long-standing issues like pollution and traffic congestion in the capital.
• The BJP’s victory in Delhi is part of its larger strategy to strengthen its foothold in urban centers across India.
• Congress Party:
• The has seen a decline in its influence in Delhi over the last decade.
• Despite efforts to rebuild its voter base, Congress failed to make significant gains in the 2025 elections.
• The party’s focus on did not resonate strongly with Delhi’s urban electorate.
• Delhi Legislative Assembly:
• The Delhi Legislative Assembly consists of, with elections held every five years.
• The assembly plays a crucial role in governing Delhi, which is a with partial statehood.
• The winning party needs a majority of to form the government.
Important Points
• Election Process:

• Elections in Delhi are conducted under the supervision of the Election Commission of India.
• Voting is carried out using Electronic Voting Machines (EVMs), ensuring transparency and efficiency.
• Voter turnout in Delhi has consistently been high, reflecting the active political engagement of its citizens.
• Key Issues in 2025 Elections:
• Air quality in Delhi continues to be a major concern, influencing voter priorities.
• Promises of better roads, public transport, and housing were central to party manifestos.
• Addressing unemployment and job creation were significant themes during the election campaign.
• - The BJP's victory in Delhi strengthens its position in national politics, showcasing its ability to win urban constituencies.
• This win might influence upcoming elections in other states, setting a precedent for urban electoral strategies.

Q37. Answer: (b) 2 October 1952

The correct answer is Thu Oct 02 1952 00:00:00 GMT+0530 (India Standard Time).

Key Points

• The Community Development Programme (CDP) was launched in India on October 2, 1952, coinciding with the birth anniversary of Mahatma Gandhi.
• The programme was introduced as a pilot project aimed at promoting rural development by empowering villages through systematic planning and holistic development strategies.
• The objective of CDP was to bring about an integrated development of rural areas by improving agriculture, infrastructure, health, education, and employment opportunities.
• The initiative marked a significant shift in the Indian government's approach to community and rural development, emphasizing local participation and self-reliance.
• Under CDP, selected villages were targeted to serve as models for other villages, focusing on the bottom-up approach of development.

Additional Information

• Background of Community Development Programme:
• The programme was inspired by international experiences, particularly the success of rural reconstruction initiatives in China and the United States.
• India's First Five-Year Plan (1951–1956) included CDP as a major policy intervention for rural development.
• The programme was implemented under the supervision of the Planning Commission, and its goals aligned with the overarching vision of economic planning in India post-independence.
• Key Features of CDP:
• The programme aimed at fostering self-sufficiency in villages through community participation.
• It covered various aspects such as agriculture, irrigation, education, healthcare, animal husbandry, sanitation, and rural industries.
• The government provided resources, technical knowledge, and financial assistance to ensure successful implementation of the programme.
• Significance of October 2:
• The launch date coincided with Mahatma Gandhi's birth anniversary, symbolizing the integration of Gandhian ideals of rural self-reliance and community empowerment into national development policies.
• This date was chosen to highlight the importance of inclusive development and community participation, which were central to Gandhi's philosophy.
• Impact and Challenges:
• The programme served as the foundation for subsequent rural development schemes such as Integrated Rural Development Programme (IRDP) and National Rural Employment Guarantee Act (NREGA).
• However, challenges like lack of adequate resources, bureaucratic inefficiencies, and limited participation of local communities hindered its effectiveness in some regions.
• Current Relevance:
• CDP laid the groundwork for modern rural development programmes and participatory governance models in India.
• The principles of community involvement and integrated development continue to be integral to initiatives like National Rural Livelihood Mission (NRLM) and Swachh Bharat Abhiyan.

Important Points

• Five-Year Plans: CDP was initiated during India's First Five-Year Plan, which focused on agriculture and rural development as key priorities for economic growth.
• Villages as Models: Selected villages under CDP were developed as models of integrated development to inspire neighboring villages.

• Legacy of CDP: The programme is considered a landmark in the history of rural development in India, influencing policies and strategies for decades.

• Role of Planning Commission: The Planning Commission played a crucial role in designing and monitoring the programme as part of India's development planning.

• Gandhian Philosophy: The emphasis on rural self-reliance in CDP reflects Gandhian ideals, which continue to inspire India's development agenda.

Q38. Answer: (c) Ghumusar, Odisha

The correct answer is Ghumusar, Odisha.

Key Points

• Dora Bisoi and Chakra Bisoi were prominent leaders of the Khond rebellion in the Ghumusar region of present-day Odisha. They played a crucial role in leading the tribal resistance against British colonial policies. The statement is correct.

• The Khond uprising in Ghumusar was a response to the increasing interference of the British in their social, economic, and political structure. The statement is correct.

• The Khonds, a tribal community in Odisha, faced severe exploitation due to the oppressive policies of the British, including the introduction of new taxes and land revenue systems. This led to their economic suffering. The statement is correct.

• The British administrative interventions, such as the imposition of foreign laws and regulations, disrupted the traditional way of life of the Khonds, which led to widespread dissatisfaction and unrest. The statement is correct.

• The Khond rebellion in Ghumusar, led by Dora Bisoi and Chakra Bisoi, was one of the significant tribal uprisings in the 19th century against British colonization. It reflects the resistance of indigenous communities to foreign rule and exploitation. The statement is correct.

Additional Information

• The Khonds:

• The Khonds are an indigenous tribal community primarily residing in the hilly regions of Odisha and parts of Andhra Pradesh, Chhattisgarh, and Jharkhand.

• They have a distinct culture and are known for their unique traditions, including the worship of nature and the practice of shifting cultivation.

• They faced significant exploitation under British rule, including displacement from their lands and the imposition of foreign laws and taxes.

• Ghumusar Rebellion:

• The rebellion took place in the Ghumusar region during the 1830s and 1840s as a direct response to the British policies that disrupted the socio-economic structure of the Khonds.

• The leaders, Dora Bisoi and Chakra Bisoi, mobilized the tribal community to resist British rule and protect their rights and way of life.

• This rebellion is considered one of the earliest and most significant tribal uprisings in India.

• British Policies and Their Impact:

• The introduction of new land revenue systems, heavy taxation, and the promotion of commercial agriculture led to the displacement of the Khonds and other tribal communities.

• The British also interfered with the traditional social and political systems of the Khonds, which further fueled the rebellion.

• The Khonds resisted these changes, as they were seen as a threat to their autonomy and cultural identity.

• Legacy of the Rebellion:

• The Ghumusar rebellion is remembered as a significant event in the history of tribal resistance against colonial rule in India.

• It highlights the resilience and determination of the tribal communities to protect their rights and way of life.

• The rebellion also drew attention to the plight of the tribal communities and the need for a more inclusive and equitable approach to governance.

Important Points

• Impact of Tribal Uprisings:

• Tribal uprisings like the Ghumusar rebellion played a crucial role in shaping the freedom struggle in India by highlighting the issues faced by marginalized communities.

• They served as a reminder of the need for a more inclusive and just society, where the rights and interests of all communities are respected and protected.

• Other Tribal Uprisings:

• In addition to the Ghumusar rebellion, several other tribal uprisings took place during the colonial period, including the Santhal Rebellion (1855-56), the Munda Rebellion (1899-1900), and the Rampa Rebellion (1922-24).

• These uprisings were driven by similar issues, such as displacement, exploitation, and the imposition of foreign laws and

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policies.

Q39. Answer: (b) FC Goa

The correct answer is FC Goa.

Key Points

• FC Goa won the 2025 Kalinga Super Cup, showcasing their dominance in Indian football.

• The Kalinga Super Cup is one of the prestigious football tournaments in India, attracting top football clubs across the nation for competitive matches.

• FC Goa is known for its consistent performance in Indian football leagues and tournaments, including the Indian Super League (ISL).

• The club has earned a reputation for its attacking gameplay and nurturing young Indian talents, which significantly contributed to their victory in the tournament.

• FC Goa's triumph in the 2025 Kalinga Super Cup adds to their accolades, solidifying their position as one of India's top football clubs.

Additional Information

• FC Goa:

• Founded in 2014, FC Goa is a professional football club based in Goa, India.

• It is one of the most successful clubs in the Indian Super League (ISL) and has a strong fan base known as the Gaurs.

• They are the first Indian club to qualify for the group stage of the AFC Champions League in 2021.

• Known for their attacking style of play, the team has contributed significantly to the growth of Indian football.

• Kalinga Super Cup:

• A premier football tournament in India, the Kalinga Super Cup is held annually and features top Indian football clubs.

• The tournament is named after the historical region of Kalinga, which is now part of Odisha, and aims to promote football in the region.

• The event attracts a mix of established teams and emerging talents, providing a platform to showcase footballing skills.

• Other Clubs Mentioned:

• Jamshedpur FC: Based in Jamshedpur, this ISL team was established in 2017. Known for its robust defensive play, the team is owned by Tata Steel.

• Bengaluru FC: Founded in 2013, Bengaluru FC is one of the most successful clubs in Indian football, having won multiple ISL and I-League titles.

• ATK Mohun Bagan: A merger of ATK and Mohun Bagan in 2020, it is one of the oldest and most prestigious football clubs in India, with a rich history.

• Indian Football Development:

• The rise of leagues like the Indian Super League (ISL) and tournaments like the Kalinga Super Cup have played a key role in the growth of football in India.

• Such tournaments provide a platform for young players to showcase their talent and gain exposure at a national level.

• They also attract international players and coaches, further improving the quality of Indian football.

Q40. Answer: (a) Prayagraj

The correct answer is Prayagraj.

Key Points

• Motilal Nehru National Institute of Technology (MNNIT) is located in Prayagraj, Uttar Pradesh. It is one of the premier engineering institutions in India and is renowned for its research and academic excellence.

• MNNIT is conducting research on the impact of lightning strikes on aircraft, which is a critical area of study for aviation safety. This research aims to improve the design and resilience of aircraft against lightning-related damages.

• The institute specializes in various fields of engineering and technology, including aerospace engineering, making it an ideal location for such research.

• Prayagraj is a prominent city in Uttar Pradesh, known for its historical significance, educational institutions, and as a hub for advanced research.

• This research at MNNIT aligns with India's efforts to enhance technological advancements and ensure safer aviation practices.

Additional Information

• Motilal Nehru National Institute of Technology (MNNIT):

• MNNIT was established in 1961 as a Regional Engineering College and was later upgraded to a National Institute of Technology in 2002.

• The institute is recognized for its contributions to research, particularly in aerospace, electrical, and mechanical engineering.

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• It offers undergraduate, postgraduate, and doctoral programs in various engineering disciplines.

• MNNIT has collaborations with international institutions and industries to conduct cutting-edge research and provide solutions to real-world problems.

• Lightning Impact on Aircraft:

• Lightning strikes on aircraft can cause severe damage, including structural damage, electronic system failure, and interference with navigation.

• Research in this area focuses on developing lightning-resistant materials and systems to minimize risks during flights.

• India's aviation sector is expanding rapidly, making this research crucial for ensuring passenger and aircraft safety.

• Prayagraj:

• Prayagraj, formerly known as Allahabad, is one of the oldest cities in India, with great historical and cultural importance.

• It is home to several prestigious educational institutions, including MNNIT, Allahabad University, and Indian Institute of Information Technology (IIIT).

• The city is known for hosting the Kumbh Mela, one of the largest religious gatherings in the world.

• Its strategic location and well-established infrastructure make it a favorable place for academic and research activities.

• Aviation Safety in India:

• The Directorate General of Civil Aviation (DGCA) regulates aviation safety in India, ensuring compliance with international standards.

• Research institutions, including MNNIT, contribute to the development of advanced technologies to improve safety measures in the aviation industry.

• Lightning impact studies are part of broader efforts to enhance aircraft design and operational safety.

Q41. Answer: (b) 1

Shortcut Trick

Numbers ending in 0, 2, 4, 5, 6, 8 are generally not prime (except 2 and 5).

From 476 to 485, only 477, 479, 481, and 483 are remaining odd candidates.

Apply the rule of 3: 477 (sum = 18) and 483 (sum = 15) are divisible by 3.

Check remaining numbers up to prime 19 (since √484 = 22).

481 is divisible by 13 (13 × 37), so only 479 remains as a prime number.

Therefore The correct answer is 1.

Alternate Method

Given:

Range of numbers: 476 to 485 (both included).

Method Used:

To check if a number N is prime, we test its divisibility by all prime numbers up to √N.

Calculations:

=> List of numbers: 476, 477, 478, 479, 480, 481, 482, 483, 484, 485.

=> Eliminate all even numbers (divisible by 2): 476, 478, 480, 482, 484.

=> Eliminate numbers ending with 5 (divisible by 5): 485.

=> Remaining odd numbers: 477, 479, 481, 483.

=> Check divisibility by 3 (sum of digits):

=> For 477: 4 + 7 + 7 = 18 (divisible by 3).

=> For 483: 4 + 8 + 3 = 15 (divisible by 3).

=> Remaining numbers to check: 479 and 481.

=> Approximate square root of 484 is 22, so check primes up to 19: 7, 11, 13, 17, 19.

=> For 481: 481 ÷ 13 = 37. So, 481 is not a prime number.

=> For 479: Not divisible by 7, 11, 13, 17, or 19. Hence, 479 is prime.

=> There is only 479, which is a prime number in this given range.

Therefore The correct answer is 1.

Additional Information

Prime Number Definition

A prime number is a natural number greater than 1 that has exactly two distinct positive divisors: 1 and itself.

Prime Checking Rule

To check if a number N is prime, find the approximate square root of N (√N). If N is not divisible by any prime number less than or

equal to √N, then N is a prime number.

Divisibility Rule of 3

A number is completely divisible by 3 if the sum of its digits is a multiple of 3.

Co-prime Numbers

Two numbers are said to be co-prime if their highest common factor (HCF) is exactly 1.

Q42. Answer: (a) Rs. 500

Shortcut Trick

Total list price of the items = 100 units × Rs. 50 = Rs. 5,000.

Trade discount is always calculated directly on the total list price.

Trade discount = 10% of Rs. 5,000 = Rs. 500.

Note: The scheme discount does not affect the calculation of the initial trade discount value.

Therefore The correct answer is Rs. 500.

Alternate Method

Total List Price

Rs. 5000

10%

Discount

Trade Discount

Rs. 500

Trade Discount = 10% of Total List Price

Given:

Price of one unit = Rs. 50

Number of units purchased = 100

Trade discount percentage = 10%

Scheme discount = 5% (This does not change the trade discount amount calculated on the list price)

Calculations:

=> Total List Price = Price per unit × Total units purchased

=> Total List Price = 50 × 100 = Rs. 5,000

=> Trade Discount Amount = Trade Discount % of Total List Price

=> Trade Discount Amount = 10% of 5,000

=> Trade Discount Amount = (10 ÷ 100) × 5000 = Rs. 500

Therefore The correct answer is Rs. 500.

Additional Information

Trade Discount

It is a reduction in the list price of goods granted by a seller to a buyer, usually a retailer or wholesaler. It is deducted directly from the invoice and is not recorded as a separate entry in the accounting books.

Cash Discount

It is a discount given to encourage prompt or immediate payment. It is always calculated on the net invoice price (List Price − Trade Discount).

Scheme Discount (Buy X Get Y Free)

When free articles are given with purchased articles, the effective discount percentage is given by: Discount % = [Free Articles ÷ (Purchased Articles + Free Articles)] × 100.

Q43. Answer: (b) 10 days

Shortcut Trick

Total work = 5 Men × 18 days = 90 Men-days.

Total work = 9 Women × 5 days = 45 Women-days.

Equating both: 90 Men = 45 Women => 1 Woman = 2 Men.

Target workforce = 3 Men + 3 Women = 3 Men + 3(2 Men) = 9 Men.

Time required = Total Work ÷ Target Workforce = 90 ÷ 9 = 10 days.

Therefore The correct answer is 10 days.

Alternate Method

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Given:

5 men complete the work in 18 days.

9 women complete the work in 5 days.

=> Time taken by 1 man = 5 × 18 = 90 days.

=> Time taken by 1 woman = 9 × 5 = 45 days.

Person	Days	Total Work	Efficiency
1 Man	90	90	1
1 Woman	45	2	

Calculations:

=> Efficiency of 3 men = 3 × 1 = 3 units/day.

=> Efficiency of 3 women = 3 × 2 = 6 units/day.

=> Combined efficiency of 3 men and 3 women = 3 + 6 = 9 units/day.

=> Time taken = Total Work ÷ Combined Efficiency = 90 ÷ 9 = 10 days.

Therefore The correct answer is 10 days.

Additional Information

Chain Rule (MDH Formula)

Used to solve problems involving varying workforce and hours: M1 × D1 × H1 ÷ W1 = M2 × D2 × H2 ÷ W2.

Work and Efficiency

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

Pipes and Cisterns

A similar concept where an inlet pipe does positive work (+ efficiency) and an outlet pipe does negative work (− efficiency).

Q44. Answer: (d) 30.25

Shortcut Trick

Square of 65 is 4225, so 65% of 65 = 42.25

4/5 of 15 = 4 × 3 = 12

Required difference = 42.25 − 12 = 30.25

Therefore The correct answer is 30.25.

Alternate Method

Given:

Expression = (65% of 65) − (4/5 of 15)

Calculations:

=> 65% of 65 = (65 ÷ 100) × 65

=> 65% of 65 = 4225 ÷ 100 = 42.25

=> 4/5 of 15 = (4 ÷ 5) × 15

=> 4/5 of 15 = 4 × 3 = 12

=> Difference = 42.25 − 12

=> Difference = 30.25

Therefore The correct answer is 30.25.

Additional Information

BODMAS Rule

It defines the correct sequence of calculations: Brackets, Orders (including 'of' and exponents), Division, Multiplication, Addition, and Subtraction.

Square of Numbers Ending in 5

For a two-digit number ending in 5, say 'n5', the square is calculated by multiplying 'n' with '(n + 1)' and appending 25 at the end. Example: 65^2 = (6 × 7) appended with 25 = 4225.

Percentage Reversibility

The expression a% of b is always equal to b% of a. Both evaluate to (a × b) ÷ 100.

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Q45. Answer: (d) Rs. 400

Shortcut Trick

Given, Selling Price (SP) = Rs. 348 and Discount = 13%.

Marked Price (MP) = SP × [100 ÷ (100 − D%)]

MP = 348 × [100 ÷ (100 − 13)]

MP = 348 × (100 ÷ 87)

MP = 4 × 100 = Rs. 400

Therefore The correct answer is Rs. 400.

Alternate Method

Marked Price (MP) = 100%

Selling Price = 87%

13% Off

SP = Rs. 348

MP = ?

Given:

Selling Price (SP) of the article = Rs. 348

Discount offered = 13%

Formula Used:

SP = MP − Discount

Discount = MP × (Discount % ÷ 100)

Calculations:

=> Let the Marked Price (MP) of the article be x.

=> SP = x − (13% of x)

=> SP = x × (1 − 13 ÷ 100)

=> 348 = x × (87 ÷ 100)

=> x = (348 × 100) ÷ 87

=> x = 4 × 100

=> x = 400

Therefore The correct answer is Rs. 400.

Additional Information

Marked Price & Selling Price

Marked Price (MP) is the list price or tag price printed on the article. Selling Price (SP) is the amount received after deducting the discount. SP = MP × (100 − D%) ÷ 100.

Successive Discounts

If two successive discounts of a% and b% are offered, the single equivalent discount percentage is given by: [a + b − (a × b ÷ 100)]%.

Profit & Loss Baseline

While discount is always calculated on the Marked Price (MP), Profit and Loss are always calculated on the Cost Price (CP) unless specified otherwise.

Q46. Answer: (b) 100 : 63

Shortcut Trick

Let the first number be A and the second number be B.

Convert 36% into a fraction: 36 / 100 = 9 / 25.

Equate the parts: A × 9/25 = B × 4/7

Transpose the numbers to find the ratio directly: A / B = (4 / 7) × (25 / 9)

A / B = 100 / 63

Therefore The correct answer is 100 : 63.

Alternate Method

Given:

36% of the first number is equal to 4/7 of the second number.

Formula Used:

Percentage = (Value / Base) × 100

Ratio of A to B = A / B

36% of A

=

4/7 of B

A × 9/25

=

B × 4/7

A : B = 100 : 63

Calculations:

Let the first number be A and the second number be B.

=> 36% of A = (4 / 7) of B

=> (36 / 100) × A = (4 / 7) × B

=> (9 / 25) × A = (4 / 7) × B

Cross multiplying to find the ratio A / B:

=> A / B = (4 / 7) × (25 / 9)

=> A / B = (4 × 25) / (7 × 9)

=> A / B = 100 / 63

=> A : B = 100 : 63

Therefore The correct answer is 100 : 63.

Additional Information

Percentage to Fraction Conversion

To quickly convert any percentage into a fraction, simply divide the numerical percentage value by 100 and simplify. Example: 36% = 36/100 = 9/25.

Ratio and Proportion Equality Rule

If two quantities satisfy the equation a × A = b × B, then the ratio of the quantities A : B will strictly be equal to the inverse coefficient ratio, i.e., b : a.

Compound Ratio

When two or more ratios are multiplied together, the result is called a compound ratio. If the given ratios are a : b and c : d, their compound ratio is represented as (a × c) : (b × d).

Q47. Answer: (a) Rs. 1,855

Shortcut Trick

Kushal's Profit = Total Profit − Brijesh's Profit = 12000 − 5700 = Rs. 6,300.

Profit Ratio (Kushal : Brijesh) = 6300 : 5700 = 21 : 19.

Since time is constant, Investment Ratio = Profit Ratio = 21 : 19.

Difference in investment = [(21 − 19) ÷ (21 + 19)] × Total Investment.

Difference = (2 ÷ 40) × 37100 = 3710 ÷ 2 = Rs. 1,855.

Therefore The correct answer is Rs. 1,855.

Alternate Method

Given:

Total Investment = Rs. 37,100

Total Profit = Rs. 12,000

Brijesh's Profit = Rs. 5,700

Formula Used:

Profit Ratio = Capital Ratio × Time Ratio

When time is constant, Profit Ratio = Capital Ratio

Partnership Investment & Profit Ratio

Kushal

Profit: Rs. 6300

(21 parts)

Brijesh

Profit: Rs. 5700

(19 parts)

Difference = 2 parts

Total Investment = Rs. 37,100 (40 parts)

Calculations:

=> Kushal's Profit = Total Profit − Brijesh's Profit

=> Kushal's Profit = 12,000 − 5,700 = Rs. 6,300

=> Profit Ratio (Kushal : Brijesh) = 6300 : 5700 = 63 : 57 = 21 : 19

=> Let Kushal's investment be 21x and Brijesh's investment be 19x.

=> Total Investment = 21x + 19x = 40x

=> 40x = 37,100 => x = 37,100 ÷ 40 = 927.5

=> Difference between their investments = 21x − 19x = 2x

=> Difference = 2 × 927.5 = Rs. 1,855

Therefore The correct answer is Rs. 1,855.

Additional Information

Basic Partnership Rule

Profit is always distributed in the ratio of the product of Capital invested and Time period (Profit = Capital × Time).

Simple vs Compound Partnership

If partners invest for the same time period, it is a simple partnership and Profit Ratio = Capital Ratio. If time periods are different, it is a compound partnership.

Working vs Sleeping Partner

A working partner manages the business and usually receives a fixed salary or a certain percentage of the total profit before the rest is divided according to investments.

Q48. Answer: (c) 48%

Shortcut Trick

Using the Ratio Method for Dishonest Dealer:

Weight Ratio (CP : SP) = 87 : 100 (Using 13% less weight)

Price Ratio (CP : SP) = 100 : 129 (Selling at 29% profit)

Net Ratio (CP : SP) = (87 × 100) : (100 × 129) = 87 : 129 = 29 : 43

Profit % = [(43 − 29) ÷ 29] × 100 = (14 ÷ 29) × 100 ≈ 48%

Therefore The correct answer is 48%.

Alternate Method

Given:

Claimed profit percentage = 29%

Weight used by the trader = 13% less than the true weight

Formula Used:

Profit % = [(SP − CP) ÷ CP] × 100

CP = Rs. 87

(Actual 87 g given)

SP = Rs. 129

(Claimed 29% Profit)

Profit = Rs. 42

42/87 × 100

Overall Profit Percentage ≈ 48%

Calculations:

=> Let the true weight be 100 g and the CP of 1 g be Rs. 1.

=> Total CP for 100 g = Rs. 100

=> The trader uses 13% less weight, so actual weight delivered = 100 − 13 = 87 g.

=> Actual Cost Price (CP) for the trader = Rs. 87

=> The trader claims to sell at a 29% profit on 100 g.

=> Selling Price (SP) = 100 + (29% of 100) = Rs. 129

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=> Profit earned = SP − CP = 129 − 87 = Rs. 42

=> Profit % = (42 ÷ 87) × 100 = (14 ÷ 29) × 100

=> Profit % = 1400 ÷ 29 ≈ 48.27%

=> Rounding off to the nearest whole number, we get 48%.

Therefore The correct answer is 48%.

Additional Information

Dishonest Dealer (Selling at Cost Price)

When a dealer claims to sell goods at CP but uses a false weight, the profit percentage is calculated as: Profit % = [(True Weight − False Weight) ÷ False Weight] × 100.

Dishonest Dealer (Selling at Profit / Loss)

If a trader marks up the price by x% and uses a false weight, the overall profit can be directly found using the equivalent ratio method: (Actual CP of false weight) : (SP of true weight).

Profit and Loss Basic Terms

Cost Price (CP) is the price at which the good is acquired or produced. Selling Price (SP) is the price at which it is sold. Profit is always calculated on the base of Cost Price unless stated otherwise.

Q49. Answer: (c) 3

Shortcut Trick

The product of two consecutive natural numbers is given as 6.

We know that 2 × 3 = 6, and 2 and 3 are consecutive natural numbers.

The greater number among 2 and 3 is 3.

Therefore The correct answer is 3.

Alternate Method

Given:

The product of two consecutive natural numbers = 6

Method Used:

Let the two consecutive natural numbers be x and (x + 1).

Formulate a quadratic equation based on their product and solve for x.

Calculation:

=> x × (x + 1) = 6

=> $x^2 + x = 6$

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

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

=> x(x + 3) − 2(x + 3) = 0

=> (x − 2)(x + 3) = 0

=> x = 2 or x = −3

=> Since the numbers are natural numbers, x cannot be negative. So, x = 2.

=> The consecutive numbers are 2 and (2 + 1) = 3.

=> The greater number is 3.

Therefore The correct answer is 3.

Additional Information

Natural Numbers

Natural numbers are counting numbers starting from 1 to infinity (1, 2, 3, ...). They do not include zero, fractions, decimals, or negative numbers.

Consecutive Integers

Consecutive integers follow each other continuously in the sequence n, n+1, n+2, etc. For consecutive even or odd numbers, the sequence follows n, n+2, n+4.

Quadratic Equation Roots

For a standard quadratic equation $ax^2 + bx + c = 0$, the sum of roots is −b/a and the product of roots is c/a. The roots can be determined by splitting the middle term or using the formula $x = (-b \pm \sqrt{(b^2 - 4ac)}) \div 2a$.

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Q50. Answer: (c) 152

Shortcut Trick

The sum of the first 'n' odd natural numbers is directly equal to n^2.

Therefore, the average of the first 'n' odd natural numbers is $n^2 \div n = n$.

Here, the number of terms (n) is 152.

So, the average is directly equal to 152.

Therefore The correct answer is 152.

Alternate Method

Given:

Number of terms (n) = 152

The sequence of the first 152 odd natural numbers is: 1, 3, 5, 7, ... up to 152 terms.

Formula Used:

Average of an Arithmetic Progression = (First term + Last term) ÷ 2

Last term (l) of an AP = a + (n − 1) × d

1

3

5

.....

303

Average = (First Term + Last Term) ÷ 2

Average = (1 + 303) ÷ 2 = 152

Calculations:

=> First term (a) = 1

=> Common difference (d) = 2

=> Last term (l) = 1 + (152 − 1) × 2

=> Last term = 1 + 151 × 2 = 1 + 302 = 303

=> Average = (1 + 303) ÷ 2

=> Average = 304 ÷ 2 = 152

Therefore The correct answer is 152.

Additional Information

Average of first n natural numbers

The average of the first n natural numbers is given by the formula (n + 1) ÷ 2.

Average of first n even natural numbers

The average of the first n even natural numbers is directly given by the formula (n + 1).

Average of squares of first n natural numbers

The average of the squares of the first n natural numbers is given by the formula (n + 1)(2n + 1) ÷ 6.

Average of an Arithmetic Progression

For any sequence of numbers with a constant difference, the average is always calculated as (First Term + Last Term) ÷ 2.

Q51. Answer: (c) 4/5

Shortcut Trick

Apply the Componendo & Dividendo rule to find tan α directly.

=> $\tan \alpha = (3 + 1) / (3 - 1) = 2$

=> $\sin^2 \alpha = \tan^2 \alpha / (1 + \tan^2 \alpha)$

=> $\sin^2 \alpha = 2^2 / (1 + 2^2) = 4 / 5$

Therefore The correct answer is 4/5.

Alternate Method

α

Base = 1

Perpendicular = 2

Hypotenuse = √5

Given:

=> (sin α + cos α) / (sin α − cos α) = 3

Formula Used:

=> tan α = sin α / cos α

=> sin α = Perpendicular / Hypotenuse

=> Hypotenuse = √(Perpendicular² + Base²)

Calculations:

Dividing the numerator and the denominator by cos α:

=> (tan α + 1) / (tan α − 1) = 3

=> tan α + 1 = 3(tan α − 1)

=> tan α + 1 = 3 tan α − 3

=> 2 tan α = 4

=> tan α = 2

From the definition of tan α in a right-angled triangle:

=> Perpendicular = 2, Base = 1

=> Hypotenuse = √(2² + 1²) = √(4 + 1) = √5

Now, finding sin α:

=> sin α = Perpendicular / Hypotenuse = 2 / √5

Squaring both sides:

=> sin² α = (2 / √5)² = 4 / 5

Therefore The correct answer is 4/5.

Additional Information

Fundamental Trigonometric Identities

The standard Pythagorean identities state that $\sin^2\theta + \cos^2\theta = 1$, $1 + \tan^2\theta = \sec^2\theta$, and $1 + \cot^2\theta = \text{cosec}^2\theta$.

Componendo and Dividendo Rule

If a / b = c / d, then according to this algebraic rule, (a + b) / (a − b) = (c + d) / (c − d). This rule is heavily used for simplifying rational expressions quickly.

Trigonometric Ratios in a Right Triangle

In any right-angled triangle, sin θ = Perpendicular ÷ Hypotenuse, cos θ = Base ÷ Hypotenuse, and tan θ = Perpendicular ÷ Base.

Q52. Answer: (c) 44%

Shortcut Trick

If the overall percentage of a quantity is equal to the percentage of one of its parts, then the percentage of the remaining part must be identical.

Here, the overall literacy rate is 44% and the male literacy rate is also 44%.

Let the female literacy rate be x%. Using the weighted average concept:

44% of Total = 44% of Males + x% of Females => x = 44%.

Therefore The correct answer is 44%.

Alternate Method

Population Breakdown & Literacy Rate

Males: 209,000

Females: 120,000

44% Literate

x% Literate = ?

Total Literate = 44%

Given:

Total Population = 329000

Number of males = 209000

Overall literacy = 44%

Male literacy = 44%

Calculations:

=> Total females = Total Population − Total males

=> Total females = 329000 − 209000 = 120000

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=> Total literate population = 44% of 329000

=> Total literate population = (44 ÷ 100) × 329000 = 144760

=> Literate males = 44% of 209000

=> Literate males = (44 ÷ 100) × 209000 = 91960

=> Literate females = Total literate population − Literate males

=> Literate females = 144760 − 91960 = 52800

=> Percentage of literate females = (Literate females ÷ Total females) × 100

=> Percentage = (52800 ÷ 120000) × 100

=> Percentage = 44%

Therefore The correct answer is 44%.

Additional Information

Weighted Average Property

If two components of a mixture or group have the exact same percentage or average, the overall group will also have that same percentage. Conversely, if the overall average equals one group's average, the second group's average is identical.

Percentage Breakdown

Overall Percentage = (Part 1 % × Part 1 Ratio) + (Part 2 % × Part 2 Ratio). This is widely used in population demographics, mixtures, and profit-loss combined problems.

Base of Percentage

When calculating the percentage for a specific subgroup (like females), the denominator must be the total number of individuals in that specific subgroup, not the overall total population.

Q53. Answer: (b) 12:05 p.m.

Shortcut Trick

Time taken by A = 7 hours (8 a.m. to 3 p.m.) and B = 5 hours (10 a.m. to 3 p.m.).

Let total distance = LCM(7, 5) = 35 units => Speed of A = 5 units/hr, Speed of B = 7 units/hr.

Distance covered by A before B starts (8 a.m. to 10 a.m.) = 5 × 2 = 10 units.

Remaining distance = 25 units. Time to meet = 25 ÷ (5 + 7) = 25/12 hours = 2 hrs 5 mins.

Meeting time = 10:00 a.m. + 2 hrs 5 mins = 12:05 p.m.

Therefore The correct answer is 12:05 p.m.

Alternate Method

Given:

Train A leaves at 8:00 a.m. and arrives at 3:00 p.m. (Total time = 7 hours)

Train B leaves at 10:00 a.m. and arrives at 3:00 p.m. (Total time = 5 hours)

Formula Used:

Speed = Distance ÷ Time

Time = Distance ÷ Relative Speed

M

N

Meeting Point

Train A (8:00 a.m.)

5 units/hr

Train B (10:00 a.m.)

7 units/hr

Total Distance = LCM(7, 5) = 35 units

Calculation:

=> Let the total distance between station M and station N be D km.

=> Speed of Train A = D/7 km/hr

=> Speed of Train B = D/5 km/hr

=> Train A starts at 8:00 a.m. and Train B starts at 10:00 a.m.

=> In 2 hours (8:00 a.m. to 10:00 a.m.), distance covered by Train A = 2 × (D/7) = 2D/7 km

=> Remaining distance = D − 2D/7 = 5D/7 km

=> Now, both trains are moving towards each other.

=> Relative Speed = (D/7) + (D/5) = (5D + 7D) ÷ 35 = 12D/35 km/hr

=> Time taken to meet after 10:00 a.m. = Remaining distance ÷ Relative Speed

=> Time = (5D/7) ÷ (12D/35)

=> Time = (5/7) × (35/12) = 25/12 hours

=> 25/12 hours = 2 hours and (1/12 × 60) minutes = 2 hours 5 minutes

=> Meeting time = 10:00 a.m. + 2 hours 5 minutes = 12:05 p.m.

Therefore The correct answer is 12:05 p.m.

Additional Information

Relative Speed (Opposite Directions)

When two objects move in opposite directions, their relative speed is the sum of their individual speeds: S = S1 + S2.

Relative Speed (Same Direction)

When two objects move in the same direction, their relative speed is the difference of their individual speeds: S = S1 − S2.

Meeting Time Formula

Meeting Time = Initial gap between them ÷ Relative Speed.

Q54. Answer: (b) Rs. 705

Shortcut Trick

Since the time of investment is the same, profit is distributed in the ratio of investments.

Difference in ratio of B and C = 90 − 43 = 47 parts.

Total profit ratio = 61 + 43 + 90 = 194 parts.

Difference = (47 ÷ 194) × 2910

Difference = 47 × 15 = 705

Therefore The correct answer is Rs. 705.

Alternate Method

Given:

Ratio of investments of A, B and C = 61 : 43 : 90

Total profit earned at the end of the year = Rs. 2,910

Formula Used:

Profit Ratio = Capital × Time

(Since time is equal for all, Profit Ratio = Capital Ratio)

A (61)

B (43)

C (90)

Diff = 47

Total Profit = 194 parts = Rs. 2,910

Calculations:

=> Let the profits of A, B, and C be 61x, 43x, and 90x respectively.

=> Total profit = 61x + 43x + 90x = 194x

=> 194x = 2910

=> x = 2910 ÷ 194 = 15

=> Difference between share of B and C = 90x − 43x = 47x

=> Difference = 47 × 15 = 705

Therefore The correct answer is Rs. 705.

Additional Information

Simple Partnership

When investments are made for the same time period, profit is shared in the ratio of the invested capitals. (P1 : P2 = C1 : C2)

Compound Partnership

When investments are for different time periods, profit is shared in the ratio of the product of capital and time. (P1 : P2 = C1 × T1 : C2 × T2)

Working / Sleeping Partner

A working partner manages the business and gets an extra salary or profit percentage. A sleeping partner only invests capital and shares the remaining profit.

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Q55. Answer: (c) 122°

Shortcut Trick

In triangle ABC, angle BCA = 180° − (131° + 20°) = 29°.

Since BC || AD, alternate interior angles are equal => angle CAD = angle BCA = 29°.

In triangle ACD, given AC = CD, so angles opposite to them are equal => angle CDA = angle CAD = 29°.

Now, angle ACD = 180° − (29° + 29°) = 122°.

Therefore The correct answer is 122°.

Alternate Method

Given:

Trapezium ABCD where BC || AD.

AC = CD.

angle ABC = 20° and angle BAC = 131°.

Formulas Used:

Sum of angles in a triangle = 180°.

Alternate interior angles are equal when two parallel lines are intersected by a transversal.

Angles opposite to equal sides of a triangle are equal.

20°

131°

29°

29°

29°

122°

A

B

C

D

angle ACD = 122°

Calculations:

In triangle ABC:

=> angle ABC + angle BAC + angle BCA = 180°

=> 20° + 131° + angle BCA = 180°

=> angle BCA = 180° − 151° = 29°

Since BC || AD and AC is the transversal line intersecting them:

=> angle CAD = angle BCA = 29° (Alternate interior angles)

In triangle ACD:

Since AC = CD, the triangle is isosceles.

=> angle CDA = angle CAD = 29°

Sum of angles in triangle ACD:

=> angle ACD + angle CAD + angle CDA = 180°

=> angle ACD + 29° + 29° = 180°

=> angle ACD + 58° = 180°

=> angle ACD = 122°

Therefore The correct answer is 122°.

Additional Information

Trapezium Properties

A quadrilateral with exactly one pair of parallel sides. The parallel sides are called bases, and the non-parallel sides are legs.

Alternate Interior Angles

When two parallel lines are intersected by a transversal, the angles formed on opposite sides of the transversal and between the parallel lines are equal.

Isosceles Triangle Theorem

If two sides of a triangle are equal in length, the angles opposite to those sides are also equal in measure.

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Q56. Answer: (a) 2 years

Shortcut Trick

Ratio of Amount to Principal = 2601 / 2500

Rate (R) = 2% = 2/100 = 1/50

Multiplying factor for 1 year = (1 + 1/50) = 51/50

Since $(51/50)^2 = 2601/2500$, the exponent equals the time period.

Therefore The correct answer is 2 years.

Alternate Method

Given:

Principal (P) = Rs. 2500

Amount (A) = Rs. 2601

Rate of Interest (R) = 2% per annum

Formula Used:

A = P(1 + R/100)^T

Principal

Rs. 2500

Amount

Rs. 2601

R = 2% p.a.

T = ? years

Compound Interest Calculation

Calculations:

=> 2601 = 2500 × (1 + 2/100)^T

=> 2601 ÷ 2500 = (102/100)^T

=> 2601 / 2500 = (51/50)^T

=> We know that $50^2 = 2500$ and $51^2 = 2601$.

=> $(51/50)^2 = (51/50)^T$

=> Comparing the exponents on both sides, we get T = 2.

Therefore The correct answer is 2 years.

Additional Information

Effective Compound Interest Rate

The effective interest rate for 2 years compounded annually is X + Y + (X × Y) ÷ 100. For 2%, it is 2 + 2 + (2 × 2) ÷ 100 = 4.04%.

Difference Between CI and SI

For a 2-year period, the difference between Compound Interest (CI) and Simple Interest (SI) on a principal P is calculated as Difference = $P(R \div 100)^2$.

Half-Yearly Compounding

When compound interest is applied half-yearly, the interest rate is halved (R ÷ 2) and the time period is doubled (2T).

Q57. Answer: (c) -39

Shortcut Trick

Apply the BODMAS rule directly to the expression: (-9) − (-60) ÷ (-10) + (-3) × 8

First, solve the division: (-60) ÷ (-10) = 6

Next, solve the multiplication: (-3) × 8 = -24

Finally, perform subtraction and addition from left to right: -9 − 6 − 24 = -39

Therefore The correct answer is -39.

Alternate Method

Given:

Expression: (-9) − (-60) ÷ (-10) + (-3) × 8

Concept Used:

BODMAS Rule: Priority order is Brackets, Orders, Division, Multiplication, Addition, and Subtraction.

Calculations:

=> Expression = (-9) − [(-60) ÷ (-10)] + [(-3) × 8]

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=> (-60) ÷ (-10) = 6

=> (-3) × 8 = -24

Substitute the evaluated values back into the expression:

=> (-9) − 6 + (-24)

=> -15 − 24

=> -39

Therefore The correct answer is -39.

Additional Information

BODMAS Rule

It dictates the order of mathematical operations: Brackets (), { }, [], Order (powers, roots), Division (÷), Multiplication (×), Addition (+), and Subtraction (−).

Sign Rules for Multiplication & Division

When multiplying or dividing two numbers with the same signs, the result is positive [(−) × (−) = (+)]. With different signs, the result is negative [(−) × (+) = (−)].

Sign Rules for Addition & Subtraction

When adding two negative numbers, add their absolute values and keep the negative sign (e.g., -5 − 3 = -8). When signs differ, subtract the smaller absolute value from the larger and keep the sign of the larger absolute value.

Q58. Answer: (b) 9,630

Shortcut Trick

The average of the ratio values 3, 5, and 7 is (3 + 5 + 7) ÷ 3 = 5 units.

Here, 5 units correspond to the average price of Rs. 16,050.

1 unit = 16,050 ÷ 5 = Rs. 3,210.

The price of the cheapest item is 3 units = 3 × 3,210 = Rs. 9,630.

Therefore The correct answer is Rs. 9,630.

Alternate Method

Given:

Average price of three items = Rs. 16,050

Ratio of their prices = 3 : 5 : 7

Formula Used:

Sum of values = Average × Number of items

Average = Rs. 16,050 → Total = 3 × 16,050 = Rs. 48,150

3x

Cheapest

5x

7x

Total = 15x

15x = 48,150 => x = 3,210 => 3x = Rs. 9,630

Calculations:

=> Let the prices of the three items be 3x, 5x, and 7x respectively.

=> Total price of the three items = 3x + 5x + 7x = 15x

=> Average price = Total price ÷ 3

=> 15x ÷ 3 = 16,050

=> 5x = 16,050

=> x = 16,050 ÷ 5 = 3,210

=> The price of the cheapest item is 3x.

=> Cheapest item price = 3 × 3,210 = Rs. 9,630

Therefore The correct answer is Rs. 9,630.

Additional Information

Average (Arithmetic Mean)

The average is the sum of all observations divided by the total number of observations: Average = Sum of observations ÷ Number of observations.

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Ratio & Proportion

A ratio compares two or more quantities. When an amount is divided in the ratio a : b : c, the parts are proportional to ax, bx, and cx respectively, where x is the common multiplier.

Properties of Averages

If every observation in a dataset is multiplied or divided by a constant 'k', the new average will also be multiplied or divided by 'k' respectively.

Q59. Answer: (b) 5.51

Shortcut Trick

Using the direct formula for Curved Surface Area: CSA = 2πrh

=> Radius (r) = CSA ÷ (2 × π × h)

=> r = 1800 ÷ (2 × 22/7 × 52)

=> r = (1800 × 7) ÷ (44 × 52) = 12600 ÷ 2288

=> r ≈ 5.5069 cm ≈ 5.51 cm

Therefore The correct answer is 5.51 cm.

Alternate Method

Given:

Outer curved surface area of the cylindrical rod = 1800 cm^2

Length (height, h) of the rod = 52 cm

π = 22/7

r = ?

h = 52 cm

CSA = 1800 cm^2

Formula Used:

Curved Surface Area of a cylinder = 2πrh

Where 'r' is the outer radius and 'h' is the length of the rod.

Calculations:

=> 2 × (22/7) × r × 52 = 1800

=> (44/7) × 52 × r = 1800

=> (2288/7) × r = 1800

=> r = (1800 × 7) ÷ 2288

=> r = 12600 ÷ 2288

=> r ≈ 5.5069 cm

Rounding off to two decimal places, we get r = 5.51 cm.

Therefore The correct answer is 5.51 cm.

Additional Information

Curved Surface Area (CSA)

It is the area of the lateral surface excluding the circular bases. Formula: CSA = 2πrh.

Total Surface Area (TSA)

It includes the curved surface area along with the area of the top and bottom circular bases. Formula: TSA = 2πr(h + r).

Volume of a Cylinder

It represents the total capacity inside the standard cylinder. Formula: Volume = $\pi r^2 h$.

Q60. Answer: (b) 18, 62

Shortcut Trick

Check the given options to find the correct pair of numbers.

Condition 1: The sum of the two numbers must be 80.

Condition 2: Both numbers must completely divide their L.C.M. (558).

Only for 18 and 62, 558 ÷ 18 = 31 and 558 ÷ 62 = 9.

Therefore The correct answer is 18 and 62.

Alternate Method

Given:

Sum of two numbers = 80

L.C.M. of the two numbers = 558

Concept Used:

Let the H.C.F. of the two numbers be h.

The numbers can be written as hx and hy, where x and y are co-prime.

L.C.M. of the numbers = hxy

Calculation:

=> hx + hy = 80

=> h(x + y) = 80

=> hxy = 558

=> The common factor h must perfectly divide both 80 and 558.

=> Prime factorization of 80 = 2^4 × 5

=> Prime factorization of 558 = 2 × 3^2 × 31

=> The Highest Common Factor (H.C.F.) of 80 and 558 is 2, so h = 2.

=> Substitute h = 2 in the sum equation:

=> 2(x + y) = 80

=> x + y = 40

=> Substitute h = 2 in the L.C.M. equation:

=> 2xy = 558

=> xy = 279

=> We need two numbers (x and y) whose sum is 40 and product is 279.

=> Using the quadratic equation $t^2 - (x + y)t + xy = 0$

=> $t^2 - 40t + 279 = 0$

=> $t^2 - 31t - 9t + 279 = 0$

=> $t(t - 31) - 9(t - 31) = 0$

=> $(t - 9)(t - 31) = 0$

=> So, x = 9 and y = 31

=> The first number = hx = 2 × 9 = 18

=> The second number = hy = 2 × 31 = 62

Therefore The correct answer is 18 and 62.

Additional Information

Product of Two Numbers

For any two specific numbers, the mathematical product of the numbers themselves is always exactly equal to the product of their H.C.F. and L.C.M. (First Number × Second Number = H.C.F. × L.C.M.).

Co-prime Property

When two respective numbers are cleanly expressed as H×a and H×b (where H represents the H.C.F.), the fractional multipliers 'a' and 'b' must always be strictly co-prime to each other, indicating their highest common factor is solely 1.

Sum and Product of Roots

In any standard quadratic equation written as $ax^2 + bx + c = 0$, the total sum of the roots evaluates directly to $-b/a$ and the cross product of the roots calculates to c/a. This core property reliably builds back the equation when only the final sum and product values are visibly known.

Q61. Answer: (c) 13

Shortcut Trick

For divisibility by 7, 11, or 13, group digits in triplets from right to left and find the alternating difference.

Groups for 788973289: 289, 973, 788.

Alternating difference = (289 + 788) − 973 = 1077 − 973 = 104.

Since 104 is perfectly divisible by 13 (13 × 8 = 104) and not by 7, the number is divisible by 13.

Therefore The correct answer is 13.

Alternate Method

Given:

Number = 788973289

Method Used:

Check standard divisibility rules to eliminate options.

Calculations:

=> Checking for 12: A number must be divisible by 3 and 4.

=> The last two digits (89) are not divisible by 4, so the given number is not divisible by 12.

=> Checking for 18: A number must be divisible by 2 and 9.

=> The last digit (9) is odd, so it is not divisible by 2, hence not divisible by 18.

=> Checking for 7: Divide the number directly by 7.

=> 788973289 ÷ 7 = 11271046 with a remainder of 6. => Not divisible by 7.

=> Checking for 13: Divide the number directly by 13.

=> 788973289 ÷ 13 = 60690253 with a remainder of 0.

=> The number is completely divisible by 13.

Therefore The correct answer is 13.

Additional Information

Divisibility Rule of 7, 11, and 13

Make groups of 3 digits starting from the rightmost digit. Find the difference between the sum of odd-placed groups and even-placed groups. If this difference is divisible by 7, 11, or 13, the original number is also perfectly divisible by that respective number.

Divisibility Rule of 12

A number is divisible by 12 if it is exactly divisible by its co-prime factors, which are 3 and 4.

Divisibility Rule of 18

A number is divisible by 18 if it is exactly divisible by its co-prime factors, which are 2 and 9.

Q62. Answer: (c) 144

Shortcut Trick

The total interest percentage for 4.5 years at 8% per annum = 4.5 × 8% = 36%.

Simple Interest = 36% of the Principal (Rs. 400).

SI = (36 ÷ 100) × 400 = 144.

Therefore The correct answer is Rs. 144.

Alternate Method

Given:

Principal (P) = Rs. 400

Rate of Interest (R) = 8% per annum

Time (T) = 4.5 years

Formula Used:

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

Principal

Rs. 400

Rate: 8% p.a.

Time: 4.5 Years

Interest

Rs. 144

Calculations:

=> SI = (400 × 8 × 4.5) ÷ 100

=> SI = 4 × 8 × 4.5

=> SI = 32 × 4.5

=> SI = 144

Therefore The correct answer is Rs. 144.

Additional Information

Total Amount in Simple Interest

The total amount (A) is the sum of principal and interest: A = P + SI = P[1 + (R × T) ÷ 100].

Difference between SI and CI for 2 Years

The difference between compound interest and simple interest for exactly 2 years on the same principal is given by the formula: D

= P(R ÷ 100)².

Compound Interest Formula

The amount compounded annually is calculated as: A = P(1 + R ÷ 100)^T, and Compound Interest = A − P.

Q63. Answer: (c) Rs. 109.60

Shortcut Trick

Total Cost Price (CP) for 56 tube lights = Rs. 56

Number of sellable tube lights = 56 − 20 = 36

Total Selling Price (SP) = 36 × 4.60 = Rs. 165.60

Profit = Total SP − Total CP = 165.60 − 56 = Rs. 109.60

Therefore The correct answer is Rs. 109.60.

Alternate Method

Given:

Total tube lights purchased = 56

Total Cost Price (CP) = Rs. 56

Number of broken tube lights in transit = 20

Selling Price (SP) per remaining tube light = Rs. 4.60

Formula Used:

Profit = Total Selling Price − Total Cost Price

Total items: 56

Broken: 20

Sold: 36

Total CP: Rs. 56

Total SP: Rs. 165.60

(36 × Rs. 4.60)

Profit: Rs. 109.60

Calculations:

=> Number of remaining tube lights = 56 − 20 = 36

=> Total SP = Remaining quantity × Price per unit

=> Total SP = 36 × 4.60

=> Total SP = Rs. 165.60

=> Profit = 165.60 − 56

=> Profit = Rs. 109.60

Therefore The correct answer is Rs. 109.60.

Additional Information

Profit and Loss Basic Formulas

Profit occurs when Selling Price (SP) > Cost Price (CP). Formula: Profit = SP − CP. Conversely, Loss occurs when Cost Price > Selling Price. Formula: Loss = CP − SP.

Profit or Loss Percentage

Profit/Loss percentages are always calculated on the base Cost Price (CP) unless specifically asked on SP. Profit % = (Profit ÷ CP) × 100.

Wastage or Breakage during Transit

When items are damaged or broken, the Total Cost Price incurred remains unchanged, but the quantity of sellable items decreases. The loss in quantity must be adjusted against Total Selling Price, naturally impacting the final Profit or Loss margin.

Q64. Answer: (b) 523.5 cubic metre

Shortcut Trick

The diameter of the sphere is 10 m, so the radius is 5 m.

Volume of a sphere = ^4⁄3 × π × r³

Volume = ^4⁄3 × 3.141 × 5³ = ^4⁄3 × 3.141 × 125

Volume = ^(1570.5)⁄3 = 523.5 m³.

Therefore The correct answer is 523.5 cubic metre.

Alternate Method

Given:

Diameter of the spherical tank (d) = 10 m

Value of π = 3.141

Formula Used:

Volume of a sphere = ^4⁄3 × π × r³

where r is the radius of the sphere (r = d ÷ 2).

r = 5 m

Diameter = 10 m

Calculations:

=> Radius (r) = 10 ÷ 2 = 5 m

=> Volume = ^4⁄3 × 3.141 × (5)³

=> Volume = ^4⁄3 × 3.141 × 125

=> Volume = ^((4 × 125))⁄3 × 3.141

=> Volume = ^(500)⁄3 × 3.141

=> Volume = 1570.5 ÷ 3

=> Volume = 523.5 m³

Therefore The correct answer is 523.5 cubic metre.

Additional Information

Surface Area of a Sphere

The total surface area of a sphere is given by the formula 4 × π × r². A sphere has only one continuous curved surface, so its total and curved surface areas are the same.

Volume of a Hemisphere

A hemisphere is exactly half of a full sphere. Its volume is calculated as ²⁄3 × π × r³.

Surface Area of a Hemisphere

The curved surface area of a solid hemisphere is 2 × π × r². If the circular base is included, the total surface area becomes 3 × π × r².

Q65. Answer: (c) 553/95

Shortcut Trick

Total work = LCM of 16, 11, and 3 = 528 units.

Efficiency of A = 528 ÷ 16 = 33 units/day.

Efficiency of B = 528 ÷ 11 = 48 units/day.

Efficiency of (A + B + C) = 528 ÷ 3 = 176 units/day.

Efficiency of C = 176 − (33 + 48) = 95 units/day.

Time taken by C = 528 ÷ 95 = 5^(53)/95 days.

Therefore The correct answer is 5^(53)/95 days.

Alternate Method

Given:

Time taken by A = 16 days

Time taken by B = 11 days

Time taken by A, B, and C together = 3 days

Formula Used:

Total Work = LCM of given days

Efficiency = Total Work ÷ Time

Person	Days	Total Work	Efficiency
A	16	528	33
B	11	48	
A + B + C	3	176	

Calculations:

=> Efficiency of A + B = 33 + 48 = 81

=> Efficiency of C = Efficiency of (A + B + C) − Efficiency of (A + B)

=> Efficiency of C = 176 − 81 = 95

=> Time taken by C alone = Total Work ÷ Efficiency of C

=> Time taken by C = 528 ÷ 95

=> Time taken by C = 5^(53)/95 days

Therefore The correct answer is 5^(53)/95 days.

Additional Information

Work and Wages

Wages are distributed in proportion to the actual work done by each person, which directly depends on their efficiency if they work for an equal number of days.

Pipes and Cisterns

This concept is completely identical to Time & Work, but an emptying pipe acts as a person doing negative work, resulting in negative efficiency.

Alternate Day Work

When individuals work on alternate days, combine their individual efficiencies over the 2-day cycle to form a standard recurring block of work.

Q66. Answer: (a) -116x + 110

Shortcut Trick

Solve for each degree of x separately directly from the expression:

x^2 terms: $4 \times (3/4)x^2 - 3x^2 = 3x^2 - 3x^2 = 0$

x terms: $4 \times (-26x) - 3 \times 4x = -104x - 12x = -116x$

Constant terms: $4 \times 17 - 3 \times (-14) = 68 + 42 = 110$

Combining the results, we get $-116x + 110$.

Therefore The correct answer is $-116x + 110$.

Alternate Method

Given:

$4((3/4)x^2 - 26x + 17) - 3(x^2 + 4x - 14)$

Calculation:

=> Multiply the constants outside the brackets with each term inside.

=> $[4 \times (3/4)x^2 - 4 \times 26x + 4 \times 17] - [3 \times x^2 + 3 \times 4x - 3 \times 14]$

=> $(3x^2 - 104x + 68) - (3x^2 + 12x - 42)$

=> Open the second bracket and invert the signs.

=> $3x^2 - 104x + 68 - 3x^2 - 12x + 42$

=> Group the like terms together.

=> $(3x^2 - 3x^2) + (-104x - 12x) + (68 + 42)$

=> $0 - 116x + 110$

=> $-116x + 110$

Therefore The correct answer is $-116x + 110$.

Additional Information

Distributive Property

The distributive property states that $a(b + c) = ab + ac$. This rule is used to expand polynomial expressions by multiplying the term outside the parentheses with each term inside.

Combining Like Terms

Like terms are terms that have the same variables raised to the same power. To simplify an expression, we add or subtract the coefficients of like terms (e.g., $ax^n + bx^n = (a+b)x^n$).

BODMAS Rule

Always follow the order of operations. Brackets should be resolved first before addition or subtraction, followed by combining the like terms.

Q67. Answer: (d) 6

Shortcut Trick

7 years ago, Father's age = 2 × Son's age + 13.

At present, Father's age = 2 × (Son − 7) + 13 + 7 = 2 × Son + 6.

So, the father is currently 6 years older than twice the son's age.

Every passing year, the father's age increases by 1, but twice the son's age increases by 2, effectively reducing the gap by 1 year.

To close this 6-year gap and make the father exactly twice the son's age, exactly 6 years must pass.

Therefore The correct answer is 6 years.

Alternate Method

Given:

Let the present age of the father be F and the son be S.

Age 7 years ago: Father = F − 7, Son = S − 7.

7 Years Ago

Age: (F-7), (S-7)

F-7 = 2(S-7)+13

Present

Age: F, S

F = 2S + 6

After x Years

Age: (F+x), (S+x)

F+x = 2(S+x)

+7 yrs

+x yrs

Calculations:

=> According to the past condition: (F − 7) = 2 × (S − 7) + 13

=> F − 7 = 2S − 14 + 13

=> F − 7 = 2S − 1

=> F = 2S + 6 ... (Equation 1)

Let after 'x' years, the father's age be exactly twice the son's age.

=> (F + x) = 2 × (S + x)

=> F + x = 2S + 2x

=> x = F − 2S

Substitute the value of (F − 2S) from Equation 1 into the above step:

=> x = 6

Therefore The correct answer is 6 years.

Additional Information

Constant Age Difference

The age difference between two individuals always remains the same at any point in time, whether it is in the past, present, or future.

Base Variable Representation

Always assume the present age as the primary variable (e.g., x). Ages 'n' years ago become (x − n), and ages 'n' years hence become (x + n).

Cross-Multiplication Method in Ratios

When the initial age ratio is a:b and after 'T' years it becomes c:d, the respective changes can be evaluated efficiently using the cross-multiplication of their differences.

Q68. Answer: (a) 38

Shortcut Trick

Consider the nearest easy multiple of 58, which is 58 × 1000 = 58000.

Find the difference: 58000 − 57846 = 154.

Divide the difference by 58: 154 ÷ 58 gives a remainder of 38.

Since 57846 is exactly 38 short of the next multiple (58000 − 116 = 57884), we must add 38.

Therefore The correct answer is 38.

Alternate Method

Given:

Dividend = 57846

Divisor = 58

Formula Used:

Smallest number to be added = Divisor − Remainder

Calculations:

=> Divide 57846 by 58 using the standard long division method.

=> 57846 = (58 × 997) + 20

=> Here, the quotient is 997 and the remainder obtained is 20.

=> To make the given number exactly divisible by 58, the sum of the remainder and the new number must be equal to the divisor.

=> Required number to add = Divisor − Remainder

=> Required number = 58 − 20 = 38

Therefore The correct answer is 38.

Additional Information

Division Algorithm

Dividend = (Divisor × Quotient) + Remainder. This fundamental relationship forms the basis of all divisibility rules.

Number to be Subtracted

To find the smallest number to be subtracted so that the remaining number is perfectly divisible by a divisor D, you simply subtract the Remainder directly.

Number to be Added

To find the smallest positive number to be added so that the resulting sum is completely divisible, use the formula: Smallest Additive = Divisor − Remainder.

Q69. Answer: (a) 190 km/hr

Shortcut Trick

Since the distance is constant, speed is inversely proportional to time.

Time ratio = 10 : 5 = 2 : 1

Speed ratio = 1 : 2

=> New Speed = 95 × 2 = 190 km/hr.

Therefore The correct answer is 190 km/hr.

Alternate Method

Given:

Initial speed of the bus (S1) = 95 km/hr

Time taken (T1) = 10 hours

New time (T2) = 5 hours

Formula Used:

Distance = Speed × Time

Speed = Distance ÷ Time

Distance = Constant

Case 1

S = 95 km/hr, T = 10 hr

Case 2

S = ? km/hr, T = 5 hr

Time halved → Speed doubled

Calculations:

=> Total Distance = S1 × T1

=> Total Distance = 95 × 10 = 950 km

=> Now, the new speed required to cover 950 km in 5 hours (S2):

=> S2 = Total Distance ÷ T2

=> S2 = 950 ÷ 5

=> S2 = 190 km/hr

Therefore The correct answer is 190 km/hr.

Additional Information

Inverse Relation of Speed and Time

When the distance is constant, speed is inversely proportional to time: S1 × T1 = S2 × T2.

Average Speed

Average Speed = Total Distance ÷ Total Time. If two equal distances are covered at speeds a and b, Average Speed = (2 × a × b) ÷ (a + b).

Relative Speed

If two bodies move in the same direction, relative speed = |S1 − S2|. If they move in opposite directions, relative speed = S1 + S2.

Q70. Answer: (c) 22

Shortcut Trick

Apply the BODMAS rule to directly simplify the expression in mental steps.

=> 836 ÷ {30 + 2 × (7 − 3)}

=> 836 ÷ {30 + 2 × 4}

=> 836 ÷ {30 + 8}

=> 836 ÷ 38 = 22

Therefore The correct answer is 22.

Alternate Method

Given:

Expression = 836 ÷ {30 + 2 × (7 − 3)}

Formula Used:

Apply the BODMAS rule (Brackets, Orders, Division, Multiplication, Addition, Subtraction) to dictate the sequence of mathematical operations.

Calculations:

Step 1: Solve the innermost parenthesis ().

=> 836 ÷ {30 + 2 × (4)}

Step 2: Solve the multiplication operation inside the curly brackets { }.

=> 836 ÷ {30 + 8}

Step 3: Solve the addition operation inside the curly brackets { }.

=> 836 ÷ 38

Step 4: Perform the final division operation.

=> 22

Therefore The correct answer is 22.

Additional Information

BODMAS Rule Sequence

Mathematical operations must be executed in this strict order: Brackets → Orders (Powers/Roots) → Division → Multiplication → Addition → Subtraction.

Types of Brackets

When an expression contains multiple brackets, always solve them in the following order: Vinculum (Bar) first, then Parentheses (), followed by Curly Brackets {}, and finally Square Brackets [].

Left-to-Right Rule

When operations of identical precedence are present (such as Division and Multiplication, or Addition and Subtraction), always evaluate them from left to right.

Q71. Answer: (a) 157

The logic followed here is:

thus, "157" will replace the question mark in the given series.

Hence, the correct option is "Option 1".

Q72. Answer: (b) Two

Given: Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order.

1) Only three boxes are kept below G.

2) Only two boxes are kept between G and F.

3) Only B is kept above D.

4) E is kept at some place below A and at some place above C.

B
D
A
G
E
C
F

So, there are 'Two' boxes are kept above A.

Hence, the correct answer is "Option 2".

Q73. Answer: (c) MOR

The logic followed here is:

So, 'MOR' will replace the question mark in the given series.

Hence, the correct answer is "Option 3".

Q74. Answer: (a) mb

The logic followed here is:

‘close your window’ is written as ‘mb tb jb’

‘door or window ’ is coded as ‘lk mb fb’

Here,

Both English phrases contain the word “window.”

The only code that appears in both given codes is mb.

“window” is the only word common to both English phrases and mb is the only code common to both coded phrases.

So, mb is the code for Window.

Hence, the correct answer is "Option 1".

Q75. Answer: (d) Only conclusion (II) follows.

Given Statements:

All triangle are rectangle.

All square are rectangle.

The least possible Venn diagram for the given statement is:

Conclusions:

Conclusion (I): Some triangle are square.

The statements only tell us that both Triangle and Square are inside the Rectangle.

They give no information about the relationship between Triangle and Square themselves.

Therefore, Conclusion (I) does not logically follow.

Conclusion (II): Some rectangle are square.

The statement "All square are rectangle" means that every single square is a rectangle. If every square is a rectangle, it must logically mean that at least some of the rectangles are squares (specifically, all the ones that are squares!).

Therefore, Conclusion (II) logically follows.

So, Only conclusion (II) follows.

Hence, the correct answer is "Option 4".

Q76. Answer: (d) Brother

Family Chart:

Decoding the Symbols:

Symbol	$	•	@	÷
Meaning	Son	Brother	Wife	Father

Given:E $ F@G÷ M + N

It means: E is the son of F, F is the wife of G, G is the father of M, M is the brother of N.

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So, E is the 'brother' of N.
Hence, the correct answer is "Option 4".

Q77. Answer: (d) IOT

The logic followed here is:
So, 'IOT' will replace the question mark in the given series.
Hence, the correct answer is "Option 4".

Q78. Answer: (c) Two

Given: (Left) 3 * 8 & @ 9 $ 1 & 5 Ω 6 # 7 % 4 £ 2 (Right)
Now,
Symbols which is immediately preceded by an odd number but NOT immediately followed by an even number.
So, Needed pattern is: Odd Number - Symbol - not Even Number.
There are 2 Symbols which is immediately preceded by an odd number but NOT immediately followed by an even number.
Hence, the correct answer is 'Option 3'.

Q79. Answer: (b) FUME – EUFM – UMFE

Now,
ROAM – MORA – OARM
CRIB – BRCI – RICB
Let's check each Option One by One.
Option 1) PING – PNIG – GNIP
Option 2) FUME – EUFM – UMFE
Option 3) SONG – OSNG – GONS
Option 4) GUYS – SUGY – YUGS
So, Only FUME – EUFM – UMFE follows the pattern of given letter cluster.
Hence, the correct answer is 'Option 2'.

Q80. Answer: (d) VY-RS

The logic followed here is:
Option 1) KN-GI
Option 2) SV-OQ
Option 3) OR-KM
Option 4) VY-RS
Here, 'VY-RS ' is odd among the given options.
Hence, the correct answer is "Option 4".

Q81. Answer: (d) 444

The logic followed here is:
thus, "444" will replace the question mark in the given series.
Hence, the correct option is "Option 4".

Q82. Answer: (d) 12

BODMAS Table:
Given equation: 10 B 3 D 27 C 18 A 2 = ?
Now, if '+' and '-' and '×' and '÷' are interchanged, then:
=> 10 × 3 − 27 + 18 ÷ 2 = ?
=> 30 − 27 + 9 = ?
=> 3 + 9 = 12
Hence, the correct answer is "Option 4".

Q83. Answer: (d) Only conclusion (II) follows.

Given Statements:
All rectangles are squares.

All squares are trapezoids.
The least possible Venn diagram for the given statement is:
Conclusions:
Conclusion I: “All trapezoids are rectangles.”
False — The direction is reversed. Only some trapezoids (those that are squares/rectangles) are rectangles, not all.
Conclusion II: “Some trapezoids are rectangles.”
True — Because rectangles (which are trapezoids by the statements) form a part of trapezoids.
So, Only conclusion (II) follows.
Hence, the correct answer is "Option 4".

Q84. Answer: (d) BY-JF

The logic followed here is:
Option 1) SP-AV
Option 2) JG-RM
Option 3) QN-YT
Option 4) BY-JF
Here, 'BY-JF' is odd among the given options.
Hence, the correct answer is "Option 4".

Q85. Answer: (c) Two

Given: Seven boxes V, W, X, Y, Z, Q and R are kept one over the other but not necessarily in the same order.
1) V is kept second from the bottom.
2) Only three boxes are kept between V and Y.
3) Z is kept at one of the positions below V.
4) Only Q is kept between Y and R
5) W is kept at one of the positions above Y.

W
Y
Q
R
Y
Z

X will sit in the remaining place

W
Y
Q
R
X
Y
Z

So, there are 'Two' boxes are kept between X and Y.
Hence, the correct answer is "Option 3".

Q86. Answer: (b) 63

Given:
Hriday’s rank from the top = 26th

Hriday's rank from the bottom = 38th
Total number of students = (Rank from top) + (Rank from bottom) − 1
= 26 + 38 − 1
= 63
So, there are '63' students in the class.
Hence, the correct answer is "Option 2".

Q87. Answer: (d) MI-FL

The logic followed here is:
Option 1) SO-LQ
Option 2) PL-IN
Option 3) VR-OT
Option 4) MI-FL
Here, 'MI-FL' is odd among the given options.
Hence, the correct answer is "Option 4".

Q88. Answer: (a) 52

BODMAS Table:
Given equation: 8 ÷ 6 + 78 × 6 − 17 = ?
Now,
'+' and '−' are interchanged, '×' and '÷' are interchanged, then:
=> 8 × 6− 78 ÷ 6 + 17
=> 8 × 6 − 78 ÷ 6 + 17 = ?
=> 48 − 13 + 17 = ?
=> 48 − 13 + 17 = 52
Hence, the correct answer is "Option 1".

Q89. Answer: (a) KDYR

The logic followed here is:
The pattern established is: (First Word) + 5 → (Second Word).
For, WPKD is related to BUPI
For, QJEX is related to VOJC
Similarly, for FYTM
So, FYTM will be written as KDYR
Hence, the correct answer is "Option 1".

Q90. Answer: (d) Two

Given: (Left) 9 4 4 @ 6 9 5 # * + 4 9 % \ & + < > > ^ # (Right)
Now,
Numbers which is immediately preceded by a symbol and also immediately followed by another number.
So, Needed pattern is: Symbol - Number - Number.
There are 2 Numbers which is immediately preceded by a symbol and also immediately followed by another number.
Hence, the correct answer is 'Option 4'.

Q91. Answer: (b) 5 km east

Given:
Person X starts from point A and drives 5 km towards the south.
He then takes a left turn, drives 5 km, turns right and drives 5 km.
He then takes a right turn and drives 7 km. He then takes a right turn, drives 10 km.
He then takes a final left turn and drives 3 km and stops at point B.
So, He should 5 km east drive in order to reach point A again
Hence, the correct answer is "Option 2".

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Q92. Answer: (a) 8 km towards west

Given:

Manoj starts from Point Y and drives 16 km towards north.

He then takes a right turn and drives 4 km.

He then turns right and drives 16 km.

He takes a final left turn, drives 4 km and stops at Point Z.

So, He should drive 8 km towards west in order to reach Point Y again

Hence, the correct answer is "Option 4".

Q93. Answer: (a) 22, 110

The logic followed here is:

Logic: (1st number × 5) = 2nd number.

27,135

=> (27 × 5) = 135

33,165

=> (33 × 5) = 165

Now, checking the options:

Option 1) 22, 110

=> (22 × 5) = 110

Option 2) 35, 180

=> (35 × 5) ≠ 180

Option 3) 29, 125

=> (29 × 5) ≠ 125

Option 4) 19, 105

=> (19 × 5) ≠ 105

Hence, the correct option is "Option 1"

Q94. Answer: (c) A

Given: A, B, C, D, J, K and L are sitting around a circular table, facing the centre of the table.

1) Only three people sit between J and L when counted from the left of J.

2) Only three people sit between K and C when counted from the right of C.

3) D sits to the immediate right of K.

4) A is an immediate neighbour of C as well as L.

Here, A sits second to the left of B.

Hence, the correct answer is "Option 3".

Q95. Answer: (c) 546

The logic followed here is:

thus, "546" will replace the question mark in the given series.

Hence, the correct option is "Option 3".

Q96. Answer: (c) YXHG

The logic followed here is:

For, AHJQ is related to DJMS

For, MPVY is related to PRYA

Similarly, for VVEE

So, VVEE will be written as YXHG

Hence, the correct answer is "Option 3".

Q97. Answer: (b) L

Given: Seven people, G, H, I, J, K, L and S, are sitting in a row facing North.

1) Only five people sit between K and G.

2) H sits to the immediate left of G.

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3) Only one person sits between H and S.

4) L sits at some place to the left of J but at some place to the right of I.

So, L sits third from the left end of the line

Hence, the correct answer is "Option 2".

Q98. Answer: (b) 10

Given numbers: 9342865

New number formed: 7 1 5 3 9 7 3

• First from the left: 7

• First from the right: 3

Sum = 7 + 3 = 10

Hence, the correct answer is 'Option 2'

Q99. Answer: (b) 4

The logic followed here is:

For, ‘MUTE’ is coded as ‘4527’

For, ‘TOPS’ is coded as ‘1346’

So, 4 is the code for ‘T’ in that language

Hence, the correct answer is "Option 2".

Q100. Answer: (c) 6

Given numbers: 6798245

If 1 is subtracted from each odd digit and 1 is added to each even digit, we get

New digits formed: 7, 4, 6, 9, 3, 5, 2

Now arrange them in ascending order: 2, 3, 4, 5, 6, 7, 9

Highest = 9

Second lowest = 3

Difference = 9 − 3 = 6

Hence, the correct answer is 'Option 3'

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