RRB NTPC (UG) CBT-I Official Paper (Held On 15 Jun, 2026 Shift 1) (Previous Year Paper)

RRB NTPC • 2026 • 100 questions • 90 minutes • Answer key and solutions

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MATHEMATICS

Q1. Simplify the following expression:

√(0.6859 × 0.1156 × 0.64000)/(0.289 × 0.1600 × 0.54872) (Correct your answer up to three decimal places)

(a) 1.414
(b) 2.314
(c) 1.314
(d) 2.414

Q2. Two trains of lengths 160 meters and 140 meters are moving in opposite directions at 55 km/h and 65 km/h, respectively. Find the time taken by them to cross each other completely.

(a) 9 seconds
(b) 10 seconds
(c) 6 seconds
(d) 8 seconds

Q3. Two positive numbers differ by 20. The mean proportional between these two numbers is 24. What is the sum of these two numbers?

(a) 53
(b) 52
(c) 51
(d) 50

Q4. Workers P and Q can complete a task in 16 days if working together. P alone takes 24 days. If P and Q start the task together, but Q leaves after 4 days, how many more days will P alone take to finish the work?

(a) 18 days
(b) 10 days
(c) 6 days
(d) 9 days

Q5. In a school, Class A has 24 students with an average height of 160 cm, and Class B has 20 students with an average height of 168 cm. The average height of students in Class C is 165 cm. If the overall average height of all students from Classes A, B and C is 164 cm, find the number of students in Class C.

(a) 20
(b) 26
(c) 18
(d) 16

Q6. A solid cuboid of dimensions 30 cm × 20 cm × 8 cm is melted. During melting, 10% of the material is lost. The remaining metal is recast into identical cubes of side 4 cm. How many complete cubes are formed?

(a) 60
(b) 63

(c) 66
(d) 67

Q7. A borrower takes a loan of Rs. 1,860 at a simple interest rate of 12% per annum. After some years, the total amount payable becomes Rs. 2,529.60. For how many years was the loan taken?
(a) 1
(b) 4
(c) 3
(d) 2

Q8. Kavita's monthly salary increased by 25%, and then decreased by 20%. If her initial salary is Rs. 58,000, what was her final salary?
(a) Rs. 60,000
(b) Rs. 64,000
(c) Rs. 58,000
(d) Rs. 55,000

Q9. The total surface area of a cube having side 94 cm is:
(a) 53,016 cm^2
(b) 53,006 cm^2
(c) 53,026 cm^2
(d) 52,989 cm^2

Q10. A and B can do a piece of work in 12 days and 30 days, respectively. Both work for 2 days and then A leaves. How long (in days) will B take to complete the remaining work?
(a) 22
(b) 23
(c) 24
(d) 25

Q11. A company hires a certain number of temporary workers for a project. If each worker is paid Rs. 500 per day, the total daily wage bill exceeds the company's budget by Rs. 4,000. If instead each worker is paid Rs. 450 per day, the total daily wage bill falls short of the budget by Rs. 2,000. Find the number of workers hired.
(a) 200
(b) 120
(c) 280
(d) 160

Q12. What should come in place of the question mark (?) in the following equation?
$(32 \div 0.8 \times ?) - 72 = 720 \div (4 \times 5 + 10)$
(a) 2.8
(b) 2.2
(c) 2.4
(d) 1.4

Q13. Find the third proportional to 8 and 16.
(a) 32
(b) 24
(c) 30
(d) 28

Q14. A number leaves a remainder of 2 when divided by 5 and a remainder of 3 when divided by 7. What is the smallest positive integer that satisfies both conditions?
(a) 23
(b) 17
(c) 38

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(d) 24

Q15. Two complementary angles are such that twice the measure of one angle is equal to three times the measure of the other. The measure of the larger angle is:

(a) 72º
(b) 60º
(c) 45º
(d) 54º

Q16. The LCM of the numbers 5, 8.3 and 0.19 is:

(a) 6925
(b) 7160
(c) 7885
(d) 7125

Q17. Raghav drives from City A to City B in three equal segments of 40 km each. He drives the first segment at 40 km/hr, the second at 60 km/hr, and the third at 120 km/hr. What is his average speed for the whole trip?

(a) 60 km/hr
(b) 68 km/hr
(c) 50 km/hr
(d) 64 km/hr

Q18. During a sale, 50% of the goods are sold at 36% profit, 40% of the remaining goods are sold at 14% profit and the still remaining goods are sold at a loss of 21%. If there is an overall profit of x%, then what is the value of x?

(a) 14.5
(b) 16.9
(c) 15.2
(d) 13.6

Q19. If the average of three numbers is 7, what is their total sum?

(a) 21
(b) 7
(c) 14
(d) 10

Q20. The sum of two positive numbers is 27 and their product is 176. The positive difference between them is:

(a) 21
(b) 24
(c) 10
(d) 5

Q21. A, B and C start a business. A invests Rs. 1,21,500 for 12 months, B invests Rs. 1,02,060 for 9 months and C invests Rs. 97,200, but withdrew Rs. 24,500 after 6 months. If the total profit earned at the end of the year is Rs. 1,69,797, find the difference between the profit share of A and the profit share of B.

(a) Rs. 26,524
(b) Rs. 26,763
(c) Rs. 26,973
(d) Rs. 26,884

Q22. A sum, when invested at 20% simple interest per annum, amounts to Rs. 5,280 after 3 years. What is the simple interest (in Rs.) on the same sum at the same rate in 2 years?

(a) 660
(b) 2,640
(c) 1,320
(d) 5,280

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Q23. What is the largest 6-digit number that is completely divisible by 96?

(a) 999912
(b) 999984
(c) 999888
(d) 999936

Q24. The price of fuel decreases by 45%, 25% and 15% in three successive months, but increases by 45% in the fourth month. What is the percentage decrease in the price of fuel in the fourth month as compared to its original price? (Round off to 2 decimal places.)

(a) 47.82%
(b) 53.54%
(c) 46.44%
(d) 49.16%

Q25. A shopkeeper fixes the marked price of an item 120% above its cost price. What percentage of discount on marked price should be allowed to gain 43%?

(a) 35%
(b) 38%
(c) 33%
(d) 32%

Q26. A wholesaler offers a trade discount of 30% on the marked price of an electric kettle to retailers. A retailer then announces a scheme discount of 12% on the price after receiving the trade discount. If the retailer sells the kettle to a customer for Rs. 2,464, what is the marked price of the kettle?

(a) Rs. 4,200
(b) Rs. 4,000
(c) Rs. 4,400
(d) Rs. 3,800

Q27. Evaluate $\sqrt{36} + \sqrt{(324/81)} + \sqrt{(9.5 \times 0.0085 \times 18.9)/(0.021 \times 0.0017 \times 1.9)}$.

(a) 152
(b) 158
(c) 154
(d) 156

Q28. A man was seven times older than his son five years ago and is now four times older. What is the son's present age?

(a) 5 years
(b) 14 years
(c) 10 years
(d) 7 years

Q29. P sells an item to Q at 25% profit. Q sells the same item to R at 60% loss. If R paid Rs. 5,166 for the item, then at what price (in Rs.) is the item purchased by P?

(a) 10,331
(b) 10,330
(c) 10,333
(d) 10,332

Q30. From the top of a building $100\sqrt{3}$ meters high, the angle of depression to a bicycle on the ground is 30°. What is the horizontal distance (in meters) from the building to the bicycle?

(a) 150
(b) 200
(c) 300
(d) 250

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GENERAL AWARENESS

Q31. In 2025, how much permanent monthly alimony did the Supreme Court set for a divorced but unmarried wife?

(a) Rs. 30,000
(b) Rs. 20,000
(c) Rs. 75,000
(d) Rs. 50,000

Q32. Who among the following administers oath of Pro Tem Speaker during initial sitting of newly elected Lok Sabha?

(a) Chief Justice of India
(b) Cabinet Secretary
(c) President of India
(d) Vice President of India

Q33. Which of the following sequences correctly matches the coastal sections from north to south on the western coast?

(a) Konkan → Karnataka → Malabar
(b) Kathiawar → Malabar → Konkan
(c) Karnataka → Konkan → Malabar
(d) Malabar → Konkan → Karnataka

Q34. Programs like MS Word, MS Excel, and PowerPoint fall into which group?

(a) Hardware components
(b) System software
(c) Application software
(d) Booting programs

Q35. Microlithic tools became a characteristic feature during which phase of prehistory in India?

(a) Middle Palaeolithic
(b) Lower Palaeolithic
(c) Early Iron Age
(d) Mesolithic

Q36. Which pact between Gandhi and the British government marked the suspension of the Civil Disobedience Movement in 1931?

(a) Poona Pact
(b) Lahore Pact
(c) Gandhi-Irwin Pact
(d) Lucknow Pact

Q37. Why was the Partition of Bengal (1905) widely opposed by Indian nationalists?

(a) It was planned to improve agricultural administration and address recurring famine conditions.
(b) It was intended to divide people on communal lines and weaken the growing nationalist movement.
(c) It was undertaken to promote regional trade expansion and economic integration of eastern Bengal.
(d) It was proposed to relocate the colonial capital for better administrative coordination.

Q38. If a person contracts malaria, which type of pathogen is responsible for the disease?

(a) Bacteria
(b) Fungi
(c) Protozoan
(d) Virus

Q39. Where is the headquarters of the South Western Railway Zone located?

(a) Jaipur
(b) Mumbai
(c) Hubballi

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(d) Jabalpur

Q40. Which of the following statements correctly explains the decline of metallic coins in the post-Gupta period?

(a) It happened because rulers preferred using older coins rather than minting new ones.
(b) It occurred due to abundant commerce that reduced dependence on minted currency.
(c) It emerged because gold supplies increased and made minting coins unnecessary.
(d) It resulted from reduced trade and rising land grants replacing cash payments.

Q41. In which year the 89^(th) Constitutional Amendment was passed related to the National Commission for Scheduled Castes?

(a) 2010
(b) 2003
(c) 1995
(d) 2006

Q42. Identify the classical language(s) in India (as of December 2022) from among the following.

1) Marathi
2) Tamil
3) Sanskrit
4) Odia

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

Q43. Where was the 353^(rd) International Labor Organization Governing body meeting held in March 2025?

(a) Copenhagen, Denmark
(b) Milan, Italy
(c) Oslo, Norway
(d) Geneva, Switzerland

Q44. Which Indian state secured the highest number of gold medals at the Khelo India Water Sports Festival, 2025?

(a) Maharashtra
(b) Kerala
(c) Madhya Pradesh
(d) Haryana

Q45. Launched in 2019 by the Union Ministry of Housing and Urban Affairs, which initiative evaluates cities on climate resilience and sustainability performance?

(a) Climate Smart Cities Assessment Framework
(b) National Action Plan on Climate Change
(c) National Mission on Sustainable Habitat
(d) Urban Climate Change Adaptation Programme

Q46. Which unique architectural feature distinguishes the Harappan site of Dholavira?

(a) Large fortifications
(b) Step-wells for water conservation
(c) Pictorial murals on walls
(d) Complex drainage systems

Q47. What is the aim of the Indian Government initiative Pradhan Mantri Gram Sadak Yojana (PMGSY)?

(a) Promote bullet trains
(b) Connect Waterways
(c) Provide rural road connectivity
(d) Build national highways

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Q48. What is the primary goal of India's Fiscal Responsibility and Budget Management (FRBM) Act of 2003?

(a) To raise taxes on petrol
(b) To control fiscal deficits
(c) To increase subsidies
(d) To boost GDP growth

Q49. The Preamble to the Constitution of India is primarily based on which resolution drafted and introduced by Pandit Jawaharlal Nehru?

(a) Fundamental Rights Resolution
(b) Objectives Resolution
(c) Directive Principles Resolution
(d) Fundamental Duties Resolution

Q50. The Indian Council Act of _____ introduced the concept of 'separate electorate' in India.

(a) 1862
(b) 1903
(c) 1861
(d) 1909

Q51. What is/are the element(s) or compound(s) that can be used in black and white photography?

(a) AgCl and AgBr
(b) Only AgCl
(c) Only Ag
(d) Only AgBr

Q52. Which of the following coastal regions of India is characterized by extensive lagoons and backwater systems along the western coastal plain?

(a) The Andhra Coast
(b) The Coromandel Coast
(c) The Malabar Coast
(d) The Northern Circars

Q53. Which of the following provisions of the Constitution of India has a specific mention for the appointment of the Attorney General of India?

(a) Article 211
(b) Article 165
(c) Article 240
(d) Article 76

Q54. Who among the following was the Commonwealth Secretary-General having led the 25th Commonwealth Foreign Affairs Ministers Meeting (CFAMM) in New York in September 2025?

(a) Patricia Scotland
(b) Ngozi Okonjo-Iweala
(c) Shirley Botchwey
(d) Kamalesh Sharma

Q55. The Balwantrai Mehta Committee recommended how many tiers of Panchayati Raj system in India?

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

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Q56. Which IIT has partnered with Coal India Limited to launch a Centre for Sustainable Energy?

(a) IIT Madras
(b) IIT Kanpur
(c) IIT Delhi
(d) IIT Bombay

Q57. Which Sustainable Development Goal (SDG) specifically aims to ensure universal access to affordable, reliable, sustainable and modern energy for all?

(a) Goal 5
(b) Goal 9
(c) Goal 13
(d) Goal 7

Q58. Which optical instrument is used to correct the eye defect known as Hypermetropia (or long-sightedness), where light focuses behind the retina?

(a) Concave Lens
(b) Photochromic Lenses
(c) Cylindrical Lens
(d) Convex Lens

Q59. Which Article of the Indian Constitution deals with the control of High Courts over subordinate courts?

(a) Article 308
(b) Article 115
(c) Article 235
(d) Article 107

Q60. The stabilisation measures introduced under India's New Economic Policy (NEP) of 1991 were primarily aimed at achieving which of the following immediate objectives?

(a) Correcting balance of payment imbalances and controlling inflationary pressures
(b) Generating rural employment opportunities and strengthening agrarian livelihoods
(c) Promoting disinvestment of public sector enterprises and reducing state control
(d) Encouraging foreign direct investment inflows and improving capital availability

Q61. What is the name of the quantum computing hub announced in Andhra Pradesh in April 2025, marking India's first major quantum valley?

(a) Nellor Quantum Hub
(b) Bengaluru Quantum Valley
(c) Amaravati Quantum Valley
(d) Vijayawada Quantum Park

Q62. During Seva Parv 2025 (17 September–2 October), what plantation target was fixed for Uttar Pradesh as part of the nationwide SDG-linked drive?

(a) 20 lakh saplings in the state
(b) 15 lakh saplings in the state
(c) 5 lakh saplings in the state
(d) 10 lakh saplings in the state

Q63. Which characteristic enables a computer to start and complete tasks automatically without human intervention once programmed?

(a) Diligence
(b) Portability
(c) Accuracy
(d) Automation

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Q64. To prevent losing your current progress due to a system crash or power failure, which essential shortcut key combination should you press regularly to quickly save the document you are working on?

(a) Ctrl + V
(b) Ctrl + C
(c) Ctrl + S
(d) Ctrl + X

Q65. Which of the following languages was conferred Classical Language status in October 2024?

(a) Marathi
(b) Kannada
(c) Tamil
(d) Odia

Q66. On March 6, 2025, EU leaders convened an extraordinary summit in which city to discuss Ukraine and European security?

(a) Brussels
(b) Vienna
(c) Paris
(d) Berlin

Q67. As computer generations progressed, which of the following has been a trend that is generally true?

(a) Computers lost memory capacity
(b) Computers stopped using electricity
(c) Computers became smaller and faster
(d) Computers became larger and slower

Q68. Which archaeological sites, besides Keeladi, have contributed to validating Sangam texts?

(a) Lothal, Dholavira, Harappa
(b) Adichanallur, Korkai, Alangulam
(c) Ajanta, Ellora, Hampi
(d) Nal, Kalibangan, Mohenjo-Daro

Q69. As per the Census of India, which of the following states recorded the highest overall literacy rate in 2011?

(a) Tamil Nadu
(b) Maharashtra
(c) Kerala
(d) Himachal Pradesh

Q70. What is the value of one tonne in SI units?

(a) 10^5 kg
(b) 10^4 kg
(c) 10^3 kg
(d) 10^2 kg

GENERAL INTELLIGENCE AND REASONING

Q71. In a certain code language,

A ≠ B means ‘A is the sister of B’

A * B means ‘A is the father of B’

A ; B means ‘A is the son of B’

A + B means ‘A is the wife of B’

Based on the above, how is F related to O if 'F ≠ G ; H + M * O'?

(a) Husband's father's sister
(b) Brother's wife

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(c) Sister
(d) Wife

Q72. LEMO is related to RJST in a certain way based on the English alphabetical order. In the same way, JYKI is related to PDQN.

To which of the following options is BNCX related, following the same logic?

(a) HSIC
(b) CISH
(c) SHIK
(d) KISH

Q73. Based on the alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) XBA
(b) ZDC
(c) DHG
(d) HMK

Q74. Based on the English alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) ZDB
(b) VZX
(c) YCA
(d) BGD

Q75. Refer to the following letter series and answer the question. (Counting to be done from left to right only)

(Left) Y O W G U R C X Z H M E S I K A Q D F T B (Right)

How many such consonants are there, each of which is immediately preceded by a consonant and also immediately followed by a vowel?

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

Q76. Mr. Yorly starts from Point A and drives 4 km towards South. He then takes a left turn, drives 23 km, turns left and drives 8 km. He then takes a left turn and drives 41 km. He takes a final left turn, drives 4 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again?

(All turns are 90 degrees turns only unless specified.)

(a) 20 km to the North
(b) 21 km to the South
(c) 19 km to the West
(d) 18 km to the East

Q77. In a certain code language, ‘world chest food’ is coded as ' rn lu vd' and ‘food sing sheep’ is coded as ‘bx rn ph’. How is ‘food’ coded in the given language?

(a) bx
(b) rn
(c) vd
(d) lu

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Q78. 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 apples are fruits. Some fruits are sweet.

Conclusions

(I) Some apples are sweet.

(II) All fruits are apples.

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

Q79. What will come in place of the question mark (?) in the following equation if '+' and '−' are interchanged and '×' and '÷' are interchanged?

$1 \div 1 \times 1 + 2 - 49 = ?$

(a) 50
(b) 46
(c) 49
(d) 48

Q80. What should come in place of the '?' in the given series?

232 ? 204 288 176 316

(a) 260
(b) 270
(c) 240
(d) 250

Q81. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

NSL HMF BGZ VAT ?

(a) PNU
(b) PIN
(c) PNK
(d) PUN

Q82. Each letter in the word PROVIDE is arranged in the English alphabetical order. How many letters are there in the English alphabetical order between the letter which is third from the left and the one which is fourth from the right in the new letter cluster thus formed?

(a) 5
(b) 8
(c) 9
(d) 6

Q83. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. A is kept second from the bottom. Only three boxes are kept between A and G. F is kept at one of the positions below A. Only E is kept between G and D. C is kept at one of the positions above G. How many boxes are kept between A and D?

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

Q84. R, E, A, D, I, N and G are sitting around a circular table, facing the centre of the table.

Only one person sits between G and E when counted from the left of E. D sits third to the right of N. R sits third to the left of I. D sits to the immediate right of R. A is not an immediate neighbor of R.

How many people sit between A and E when counted from the right of A?

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

Q85. Based on the alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) PSV
(b) NQT
(c) BEG
(d) DGJ

Q86. Seven boxes, I, J, K, L, Q, R and S, are kept one over the other, but not necessarily in the same order.

K is kept third from the bottom. Only one box is kept above R. Only one box is kept between R and Q. J is kept immediately above L. I is kept at some place below S.

How many boxes are kept between S and J?

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

Q87. What should come in place of ? in the given series based on the English alphabetical order?

LNK NPM PRO RTQ ?

(a) TUR
(b) TUW
(c) TWR
(d) TVS

Q88. What will come in place of '?' in the following equation, if '+' and '×' are interchanged and '-' and '÷' are interchanged?

8 + 3 ÷ 116 - 4 × 18 = ?

(a) 22
(b) 15
(c) 13
(d) 19

Q89. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

XBU TXQ PTM LPI ?

(a) KFO
(b) HLE
(c) APT
(d) SEL

Q90. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

(156, 204, 366)

(150, 162, 318)

(a) (142, 165, 307)
(b) (182, 164, 352)
(c) (204, 101, 309)
(d) (172, 141, 317)

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Q91. If ‘P’ stands for ‘÷’, ‘R’ stands for ‘×’, ‘S’ stands for ‘+’ and ‘Q’ stands for ‘−’, then what will come in place of the question mark (?) in the following equation?

109 S 256 P 8 Q 2 R 17 Q 58 = ?

(a) 81
(b) 23
(c) 49
(d) 57

Q92. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

Some foods are rains.

All tables are rains.

Conclusions:

(I) Some foods are tables.

(II) All rains are tables.

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

Q93. In a certain code language, ‘cap room apple’ is coded as 'og uv bc' and ‘apple queen book’ is coded as ‘wd og ex’. How is ‘apple’ coded in the given language?

(a) wd
(b) uv
(c) bc
(d) og

Q94. What should come in place of ‘?’ in the given series?

7 16 29 51 77 112 ?

(a) 160
(b) 150
(c) 161
(d) 151

Q95. Refer to the following letter series and answer the question.

(Left) L U H T R B F G A O D Q S I X M C K W (Right)

How many letters are there in the English alphabetical series between the letter which is sixth from the right end and seventh from the left end of the series?

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

Q96. In a certain code language,

A ÷ B means ‘A is the son of B’,

A # B means ‘A is the wife of B’,

A + B means ‘A is the brother of B’ and

A & B means ‘A is the father of B’.

How is S related to H if ‘S ÷ D + R # Y & H’?

(a) Mother's brother
(b) Mother's brother's son

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(c) Brother's son
(d) Father's father

Q97. R, E, A, D, I, N and G are sitting around a circular table, facing the centre of the table.

Only three people sit between G and A when counted from the left of G. Only three people sit between N and E when counted from the right of E. R sits to the immediate right of N. I is an immediate neighbor of E as well as A.

Who sits second to the left of D?

(a) N
(b) I
(c) A
(d) R

Q98. Seven boxes, I, J, K, L, Q, R and S, are kept one over the other, but not necessarily in the same order.

Only K is kept above R. Only S is kept between R and I. Only J is kept below L.

How many boxes are kept between Q and R?

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

Q99. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

OURS –UROS –ROUS

SAME –AMSE –MSAE

(a) HEAD-ADHE-DHAE
(b) THEY-HEYT-TYEH
(c) FEAR-EAFR-AFER
(d) SELF-ELFS-LFSE

Q100. Select the triad that follows the same pattern as the one followed by the two triads given below. Both triads follow the same pattern.

KF - MH - NP

MH - OJ - PR

(a) QL - SN - TV
(b) QL - SN - TU
(c) RL - SN - TU
(d) RL - SM - TU

ANSWER KEY

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

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SOLUTIONS

Q1. Answer: (a) 1.414

Shortcut Trick

Equate decimal places: Total numerator places = 13, Total denominator places = 12, resulting in a factor of 10^(−1).

Identify powers: 6859 = 19^3, 54872 = $38^3 = (2 \times 19)^3$, and 1156 = $34^2 = (2 \times 17)^2$.

Simplify the ratios: $(19/38)^3 \times (34/17)^2 \times (64000/1600) \times 0.1 = (1/8) \times 4 \times 40 \times 0.1 = 2$.

Calculate the final root: $\sqrt{2} \approx 1.414$.

Therefore The correct answer is 1.414.

Alternate Method

Given Expression: √((0.6859 × 0.1156 × 0.64000) / (0.289 × 0.1600 × 0.54872))

=> Count total decimal places in Numerator: 4 + 4 + 5 = 13.

=> Count total decimal places in Denominator: 3 + 4 + 5 = 12.

=> Remove decimals by adjusting powers of 10: √((6859 × 1156 × 64000) / (289 × 1600 × 54872) × 10^(−1))

=> Simplify the large numbers using prime factorization: 6859 = 19^3, 1156 = 34^2, 289 = 17^2, 54872 = 38^3.

=> $\sqrt{((19^3 \times 34^2 \times 40) / (17^2 \times 38^3 \times 10))}$

=> $\sqrt{((19^3 \times (2 \times 17)^2 \times 40) / (17^2 \times (2 \times 19)^3 \times 10))}$

=> $\sqrt{((19^3 \times 4 \times 17^2 \times 40) / (17^2 \times 8 \times 19^3 \times 10))}$

=> Cancel common terms: $\sqrt{((4 \times 40) / (8 \times 10))} = \sqrt{(160 / 80)} = \sqrt{2}$

=> Square root of 2 up to three decimal places = 1.414

Therefore The correct answer is 1.414.

Additional Information

Cubes of Numbers

Memorizing cubes up to 20 is crucial for simplification: $19^3 = 6859$ and $38^3 = 54872$.

Square Root Constants

Standard square root values frequently used in exams: $\sqrt{2} \approx 1.414$ and $\sqrt{3} \approx 1.732$.

Power and Indices Rule

For any numbers a and b: $(a \times b)^n = a^n \times b^n$. This helps in simplifying ratios like $(34/17)^2 = 2^2 = 4$.

Q2. Answer: (a) 9 seconds

Shortcut Trick

Relative Speed (opposite direction) = 55 + 65 = 120 km/h

Total distance to be covered = 160 + 140 = 300 m

Time = Total Distance ÷ Relative Speed

Time = 300 ÷ (120 × 5/18) = 300 ÷ (100/3) = 9 sec

Therefore The correct answer is 9 sec.

Alternate Method

Given:

Length of Train 1 (L1) = 160 m

Length of Train 2 (L2) = 140 m

Speed of Train 1 (S1) = 55 km/h

Speed of Train 2 (S2) = 65 km/h

Formula Used:

Time taken to cross = (L1 + L2) ÷ (S1 + S2)

Calculations:

=> Total Distance = 160 + 140 = 300 m

=> Relative Speed = 55 + 65 = 120 km/h

=> Convert speed to m/s = 120 × (5/18) m/s

=> Relative Speed = 600/18 = 100/3 m/s

=> Time = 300 ÷ (100/3)

=> Time = (300 × 3) ÷ 100

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=> Time = 900 ÷ 100 = 9 sec

Therefore The correct answer is 9 sec.

Additional Information

Relative Speed in Opposite Directions

When two objects move towards each other or in opposite directions, their relative speed is the sum of their individual speeds: V_(rel) = S1 + S2.

Unit Conversion Factor

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

Crossing a Stationary Object

When a train crosses a pole or a standing man, the distance covered is equal to the length of the train itself.

Q3. Answer: (b) 52

Shortcut Trick

Given difference (x − y) = 20 and mean proportional √xy = 24.

Square of mean proportional: xy = 24^2 = 576.

Using the identity: $(x + y)^2 = (x - y)^2 + 4xy$

=> $(x + y)^2 = 20^2 + 4 \times 576 = 400 + 2304 = 2704$.

=> Sum (x + y) = √2704 = 52.

Therefore The correct answer is 52.

Alternate Method

Let the two positive numbers be 'a' and 'b' (where a > b).

Given:

Difference between numbers (a − b) = 20

Mean proportional between a and b = 24

Formula Used:

1) Mean Proportional = √(a × b)

2) $(a + b)^2 = (a - b)^2 + 4ab$

=> From mean proportional definition: √ab = 24

=> Squaring both sides: ab = 24 × 24 = 576

=> We know that $(a + b)^2 = (a - b)^2 + 4ab$

=> $(a + b)^2 = (20)^2 + 4 \times 576$

=> $(a + b)^2 = 400 + 2304$

=> $(a + b)^2 = 2704$

=> a + b = √2704

=> a + b = 52

Therefore The correct answer is 52.

Additional Information

Mean Proportional

The mean proportional between two numbers a and b is the square root of their product, expressed as x = √ab.

Third Proportional

If a, b, and c are in continued proportion (a:b = b:c), then c is called the third proportional, where $c = b^2 \div a$.

Algebraic Relationship

The relationship between the sum and difference of two numbers is given by the identity $(a + b)^2 - (a - b)^2 = 4ab$.

Q4. Answer: (a) 18 days

Shortcut Trick

Combined efficiency of P and Q = 1/16, and efficiency of P alone = 1/24.

Work done by P and Q together in 4 days = 4 ÷ 16 = 1/4 of total work.

Remaining work to be finished by P alone = 1 − 1/4 = 3/4.

More days required by P = (3/4) × 24 = 18 days.

Therefore The correct answer is 18 days.

Alternate Method

Given: P and Q can complete the task in 16 days; P alone takes 24 days; they work together for 4 days.

Formula Used: Total Work = LCM of individual days; Efficiency = Total Work ÷ Time.

Person	Days	Total Work	Efficiency
P + Q	16	48 units	3 units/day
P	24	2 units/day	

=> Total work (LCM of 16 and 24) = 48 units.

=> Efficiency of P + Q = 48 ÷ 16 = 3 units/day.

=> Efficiency of P alone = 48 ÷ 24 = 2 units/day.

=> Work completed by P and Q in 4 days = 3 units/day × 4 days = 12 units.

=> Remaining work = 48 − 12 = 36 units.

=> Additional days for P alone = 36 units ÷ 2 units/day = 18 days.

Therefore The correct answer is 18 days.

Additional Information

Work and Efficiency Relationship

Efficiency is inversely proportional to the time taken (E prop. to 1/T). If a person is twice as efficient, they take half the time.

Combined Efficiency

The total efficiency of multiple workers is the sum of their individual efficiencies (E_(Total) = E1 + E2 + ...).

Pipes and Cisterns Analogy

The same LCM and efficiency method applies to tank-filling problems, where inlet pipes perform positive work and outlet pipes perform negative work.

Q5. Answer: (d) 16

Shortcut Trick

Net deviation from the overall Average Height (164 cm) must be zero.

Deviation for Class A = (160 − 164) × 24 = −96

Deviation for Class B = (168 − 164) × 20 = +80

Total deviation (A + B) = −16. To balance, Class C must provide a deviation of +16.

Deviation per student in Class C = 165 − 164 = +1.

Number of students in Class C = 16 ÷ 1 = 16.

Therefore The correct answer is 16.

Alternate Method

Given:

Class A: n_A = 24, Avg_A = 160 cm

Class B: n_B = 20, Avg_B = 168 cm

Class C: n_C = x, Avg_C = 165 cm

Overall Average = 164 cm

Formula Used:

Overall Average = (n_A × Avg_A + n_B × Avg_B + n_C × Avg_C) ÷ (n_A + n_B + n_C)

Calculations:

=> 164 = (24 × 160 + 20 × 168 + x × 165) ÷ (24 + 20 + x)

=> 164 = (3840 + 3360 + 165x) ÷ (44 + x)

=> 164(44 + x) = 7200 + 165x

=> 7216 + 164x = 7200 + 165x

=> 7216 − 7200 = 165x − 164x

=> x = 16

Therefore The correct answer is 16.

Additional Information

Weighted Average Formula

The combined average of multiple groups is calculated as A_w = (n1a1 + n2a2 + ... + n_ka_k) ÷ (n1 + n2 + ... + n_k).

Deviation Method

The sum of deviations of all observations from their arithmetic mean is always zero. This property helps in finding missing values

or averages quickly.

Average Property

The combined average must always lie between the lowest and the highest individual group averages. In this case, 160 < 164 < 168.

Q6. Answer: (d) 67

Shortcut Trick

Total Volume = 30 × 20 × 8 = 4800 cm^3

Remaining Volume = 90% of 4800 = 4320 cm^3

Volume of 1 Cube = 4^3 = 64 cm^3

Number of Cubes = 4320 ÷ 64 = 67.5 → 67 complete cubes

Therefore The correct answer is 67.

Alternate Method

Given:

Dimensions of the solid cuboid = 30 cm × 20 cm × 8 cm

Material lost during melting = 10%

Side of the identical cubes = 4 cm

Calculations:

=> Total volume of the cuboid = Length × Breadth × Height

=> Volume = 30 × 20 × 8 = 4800 cm^3

=> Volume of material lost = 10% of 4800 = (10 ÷ 100) × 4800 = 480 cm^3

=> Volume of remaining metal = 4800 − 480 = 4320 cm^3

=> Volume of one small cube = $(Side)^3 = 4^3$ = 64 cm^3

=> Number of cubes formed = Remaining Volume ÷ Volume of one cube

=> Number of cubes = 4320 ÷ 64

=> Number of cubes = 67.5

=> Since we need the number of complete cubes, we take the integer part.

Therefore The correct answer is 67.

Additional Information

Volume of Solid Shapes

For a cuboid, Volume = L × B × H. For a cube, Volume = a^3. During melting and recasting, total volume remains constant unless a percentage loss is specified.

Material Loss Calculation

If x% of material is lost, the usable volume is (100 − x)% of the initial volume. Usable Volume = V_(initial) × (1 − x/100).

Complete Units Rule

When calculating the number of discrete items formed from a bulk material, always round down to the nearest whole number if the result is a fraction.

Q7. Answer: (c) 3

Shortcut Trick

Calculate total interest percentage: Interest = 2529.60 − 1860 = 669.60

Total Interest % = (669.60 / 1860) × 100 = 36%

Since the rate is 12% per year, Time (T) = Total % / Rate per annum

T = 36% / 12% = 3 years

Therefore The correct answer is 3 years.

Alternate Method

Given:

Principal (P) = Rs. 1,860

Amount (A) = Rs. 2,529.60

Rate (R) = 12% p.a.

Formula Used: Simple Interest (SI) = (P × R × T) / 100

=> Simple Interest (SI) = Amount − Principal

=> SI = 2529.60 − 1860 = 669.60

=> 669.60 = (1860 × 12 × T) / 100
=> 669.60 = 18.6 × 12 × T
=> 669.60 = 223.2 × T
=> T = 669.60 / 223.2
=> T = 3 years
Therefore The correct answer is 3 years.
Additional Information
Simple Interest Formula
The basic formula is SI = (P × R × T) / 100, where P is Principal, R is Rate, and T is Time.
Amount Calculation
Total Amount (A) = Principal (P) + Simple Interest (SI). It can also be expressed as A = P(1 + RT/100).
Finding Rate of Interest
If time and interest are known, the rate can be calculated as R = (SI × 100) / (P × T).

Q8. Answer: (c) Rs. 58,000

Shortcut Trick
Apply the Successive Percentage Change formula: Net % change = x + y + (xy/100).
Here, x = +25% (increase) and y = −20% (decrease).
Net change = 25 − 20 + [25 × (−20) / 100] = 5 − 5 = 0%.
Since the net change is 0%, the final salary remains the same as the initial salary.
Therefore The correct answer is Rs. 58,000.
Alternate Method
Given:
Initial Salary = Rs. 58,000
First Change = 25% Increase
Second Change = 20% Decrease
Step 1: Calculate salary after 25% increase
=> Salary after increase = 58,000 + (25/100 × 58,000)
=> Salary after increase = 58,000 + 14,500 = Rs. 72,500
Step 2: Calculate salary after 20% decrease on the new amount
=> Final Salary = 72,500 − (20/100 × 72,500)
=> Final Salary = 72,500 − 14,500
=> Final Salary = Rs. 58,000
Therefore The correct answer is Rs. 58,000.
Additional Information
Successive Percentage Formula
When a value is changed by x% and then by y%, the effective change is (x + y + xy/100)%. Use positive for increase and negative for decrease.
Multiplier Method
Final Value = Initial Value × (1 ± r1/100) × (1 ± r2/100). In this case: 58,000 × 1.25 × 0.80 = 58,000 × 1 = 58,000.
Base Change Property
An increase of 25% (1/4) followed by a decrease of 20% (1/5) results in no change because (5/4) × (4/5) = 1.

Q9. Answer: (a) 53,016 cm²

Shortcut Trick
The Total Surface Area (TSA) of a cube follows the formula 6 × a².
Since the side is 94 cm, the unit digit of 94² is 6 (4 × 4 = 16).
Multiplying by 6, the final unit digit must be 6 (6 × 6 = 36).
Estimating: 94² is slightly less than 100² (10,000), so TSA is slightly less than 60,000.
Calculation: 6 × 8836 = 53016.
Therefore The correct answer is 53,016 cm².
Alternate Method

Given:

The side length (a) of the cube is 94 cm.

Formula Used:

Total Surface Area of a cube = 6 × (side)²

Calculations:

=> TSA = 6 × (94)²

=> TSA = 6 × (94 × 94)

=> $94^2 = (100 - 6)^2 = 10000 - 1200 + 36 = 8836$

=> TSA = 6 × 8836

=> TSA = 53016 cm²

Therefore The correct answer is 53,016 cm².

Additional Information

Volume of a Cube

The volume represents the total capacity of the cube and is calculated as a^3.

Lateral Surface Area (LSA)

The LSA refers to the area of only the four side faces (excluding top and bottom), given by $4 \times a^2$.

Body Diagonal of a Cube

The length of the longest rod that can be placed inside a cube is $a\sqrt{3}$.

Face Diagonal of a Cube

The diagonal of any single square face of the cube is calculated as $a\sqrt{2}$.

Q10. Answer: (b) 23

Shortcut Trick

Total work = LCM(12, 30) = 60 units.

Efficiency of A = 5 units/day, B = 2 units/day.

Work done by both in 2 days = (5 + 2) × 2 = 14 units.

Remaining work = 60 − 14 = 46 units.

Time taken by B alone = 46 ÷ 2 = 23 days.

Therefore The correct answer is 23 days.

Alternate Method

Given: A completes work in 12 days and B in 30 days.

Person	Days	Total Work	Efficiency
A	12	60	5
B	30	2	

=> Total work (LCM of 12 and 30) = 60 units.

=> Work completed by A and B together in 2 days = (5 + 2) × 2 = 14 units.

=> Remaining work to be done by B = 60 − 14 = 46 units.

=> Time taken by B to complete the remaining work = Remaining Work ÷ Efficiency of B

=> Time = 46 ÷ 2 = 23 days.

Therefore The correct answer is 23 days.

Additional Information

Relationship between Efficiency and Time

Efficiency is inversely proportional to Time. If time ratio is x : y, the efficiency ratio is y : x.

Work & Wages

Wages are generally distributed in the ratio of the work done by each person, which is the product of Efficiency × Time.

Total Work Calculation

Total work can be assumed as any multiple of the given days, but LCM is preferred to keep efficiencies in whole numbers.

Q11. Answer: (b) 120

Shortcut Trick

Total difference in the daily wage bill = Excess + Shortfall = 4000 + 2000 = Rs. 6000.

Difference in daily pay per worker = 500 − 450 = Rs. 50.

Total temporary workers = Total Difference ÷ Difference per Worker = 6000 ÷ 50 = 120.

Therefore The correct answer is 120.

Alternate Method

Given: Pay Rate1 = Rs. 500, Pay Rate2 = Rs. 450, Budget Excess = Rs. 4,000, Budget Shortfall = Rs. 2,000.

Formula Used: Total Wage Bill = Number of Workers × Daily Pay Rate

=> Let n be the number of workers and B be the company's budget.

=> Case 1: 500 × n = B + 4000

=> Case 2: 450 × n = B − 2000

=> Subtracting Case 2 from Case 1: (500n − 450n) = (B + 4000) − (B − 2000)

=> 50n = 4000 + 2000

=> 50n = 6000

=> n = 6000 ÷ 50 = 120.

Therefore The correct answer is 120.

Additional Information

Excess and Deficit Rule

When comparing two scenarios where one results in an excess (E) and the other in a shortfall or deficit (D), the total difference between the two conditions is calculated as (E + D).

Linear Equations in One Variable

These problems follow the standard form ax + b = c, where x represents the unknown quantity (like the number of workers) and can be solved by isolating the variable.

Rate-Quantity Relationship

The change in total value is equal to the quantity multiplied by the change in rate: ΔTotal = Quantity × ΔRate.

Q12. Answer: (c) 2.4

Given:

(32 ÷ 0.8 × x) − 72 = 720 ÷ (4 × 5 + 10)

Formula used:

Solve using the BODMAS rule (Bracket, Of, Division, Multiplication, Addition, Subtraction).

Calculation:

Let the missing value be x.

(32 ÷ 0.8 × x) − 72 = 720 ÷ (4 × 5 + 10)

=> (40 × x) − 72 = 720 ÷ (20 + 10)

=> 40 × x − 72 = 720 ÷ 30

=> 40 × x − 72 = 24

=> 40 × x = 24 + 72

=> 40 × x = 96

=> x = 96 ÷ 40

=> x = 2.4

Therefore The correct answer is option (3).

Q13. Answer: (a) 32

Shortcut Trick

The Third Proportional of two numbers a and b is given by the formula $b^2 \div a$.

=> Third Proportional = (16 × 16) ÷ 8

=> 256 ÷ 8 = 32

Therefore The correct answer is 32.

Alternate Method

Given:

First number (a) = 8

Second number (b) = 16

Formula Used:

If three numbers a, b, and c are in continued proportion, then:

a : b :: b : c

=> a ÷ b = b ÷ c

Calculations:

=> Let the third proportional be x.

=> 8 : 16 :: 16 : x

=> 8 ÷ 16 = 16 ÷ x

=> 1 ÷ 2 = 16 ÷ x

=> x = 16 × 2

=> x = 32

Therefore The correct answer is 32.

Additional Information

Mean Proportional

The Mean Proportional between two numbers a and b is calculated as √(a × b).

Fourth Proportional

For three numbers a, b, and c, the fourth proportional (x) satisfies a : b = c : x, which means x = (b × c) ÷ a.

Continued Proportion

Three quantities are in continued proportion if the ratio of the first to the second is equal to the ratio of the second to the third.

Q14. Answer: (b) 17

Shortcut Trick

List integers that leave remainder 2 when divided by 5: 2, 7, 12, 17, 22, ...

List integers that leave remainder 3 when divided by 7: 3, 10, 17, 24, ...

Identify the first common number that appears in both sequences.

The smallest positive integer satisfying both conditions is 17.

Therefore The correct answer is 17.

Alternate Method

Given:

Number (N) ÷ 5 → Remainder = 2

Number (N) ÷ 7 → Remainder = 3

Step-by-step Calculation:

=> Let N = 5k + 2 and N = 7m + 3

=> 5k + 2 = 7m + 3

=> 5k = 7m + 1

=> If m = 1, 5k = 8 (Not an integer)

=> If m = 2, 5k = 7(2) + 1 = 15

=> k = 15 ÷ 5 = 3

=> Smallest N = 5(3) + 2 = 17

Therefore The correct answer is 17.

Additional Information

Chinese Remainder Theorem (CRT)

CRT provides a systematic way to solve systems of linear congruences with pairwise coprime moduli like 5 and 7.

General Form of Solution

The general solution for such problems is N = (LCM(d1, d2) × n) + x, where x is the smallest positive integer and n = 0, 1, 2...

Successive Division Method

For larger numbers, use N = d1k + r1 and substitute into the second congruence to solve for k iteratively.

Q15. Answer: (d) 54º

Shortcut Trick

Ratio of the two complementary angles is 3 : 2 (since 2 × Angle1 = 3 × Angle2).

Total units = 3 + 2 = 5 units.

Given, total sum = 90º (complementary property).

5 units = 90º => 1 unit = 18º.

Larger angle = 3 units = 3 × 18º = 54º.
Therefore The correct answer is 54º.
Alternate Method
Given:
Sum of two angles = 90º
Relationship: 2 × (One angle) = 3 × (Other angle)
Formula Used:
For Complementary Angles, θ1 + θ2 = 90º.
Calculations:
Let the two angles be x and y.
=> x + y = 90º ---(i)
=> 2x = 3y ---(ii)
=> x = 3y / 2
Substituting the value of x in equation (i):
=> (3y / 2) + y = 90º
=> (3y + 2y) / 2 = 90º
=> 5y / 2 = 90º
=> 5y = 180º
=> y = 36º
Now, finding the value of x:
=> x = 90º − 36º
=> x = 54º
Comparing 54º and 36º, the larger angle is 54º.
Therefore The correct answer is 54º.
Additional Information
Complementary Angles
Two angles are called complementary if their sum is exactly 90º. Each angle is the complement of the other.
Supplementary Angles
Two angles are called supplementary if their sum is exactly 180º. They form a linear pair when placed adjacently on a straight line.
Adjacent Angles
Angles that have a common vertex and a common side but do not overlap are known as adjacent angles.

Q16. Answer: (c) 7885

Shortcut Trick
Convert decimals into their simplest fractions: 5 = 5/1, 8.3 = 83/10, and 0.19 = 19/100.
Formula: LCM of fractions = LCM of Numerators ÷ HCF of Denominators.
LCM(5, 83, 19) = 5 × 83 × 19 = 7885 (since all are co-prime).
HCF(1, 10, 100) = 1.
Result = 7885 ÷ 1 = 7885.
Therefore The correct answer is 7885.
Alternate Method
Given: Numbers are 5, 8.3, and 0.19.
Formula Used: To find the LCM of decimals, equalize the number of decimal places and find the LCM of the resulting integers.
=> Step 1: Make decimal places equal: 5.00, 8.30, 0.19.
=> Step 2: Treat them as integers: 500, 830, and 19.
=> Step 3: Find prime factors:
=> 500 = $2^2 \times 5^3$
=> 830 = 2 × 5 × 83
=> 19 = 19 (Prime)
=> Step 4: LCM = Highest powers of all prime factors = $2^2 \times 5^3 \times 83 \times 19$.
=> LCM = 4 × 125 × 83 × 19 = 500 × 1577 = 788500.
=> Step 5: Adjust decimal: 788500 ÷ 100 = 7885.

Therefore The correct answer is 7885.

Additional Information

LCM of Fractions

The Least Common Multiple (LCM) of a set of fractions is given by: (LCM of Numerators) ÷ (HCF of Denominators).

HCF of Fractions

The Highest Common Factor (HCF) of a set of fractions is given by: (HCF of Numerators) ÷ (LCM of Denominators).

Co-prime Numbers

Numbers that have only 1 as a common factor are co-prime. The LCM of co-prime numbers is always equal to their product.

Q17. Answer: (a) 60 km/hr

Shortcut Trick

When an object covers equal distances at different speeds, the Average Speed is the Harmonic Mean of the speeds.

Average Speed = 3 ÷ (1/v1 + 1/v2 + 1/v3)

=> Average Speed = 3 ÷ (1/40 + 1/60 + 1/120)

=> Average Speed = 3 ÷ (6/120) = 3 × 20 = 60 km/hr.

Therefore The correct answer is 60 km/hr.

Alternate Method

Given: Three segments of 40 km each. Speeds = 40 km/hr, 60 km/hr, and 120 km/hr.

Formula Used: Average Speed = Total Distance ÷ Total Time

Calculations:

=> Total Distance = 40 + 40 + 40 = 120 km

=> Time for 1^(st) segment (t1) = 40 ÷ 40 = 1 hour

=> Time for 2^(nd) segment (t2) = 40 ÷ 60 = 2/3 hour

=> Time for 3^(rd) segment (t3) = 40 ÷ 120 = 1/3 hour

=> Total Time = 1 + 2/3 + 1/3 = 1 + 1 = 2 hours

=> Average Speed = 120 ÷ 2 = 60 km/hr

Therefore The correct answer is 60 km/hr.

Additional Information

Two Equal Distance Segments

If a journey is divided into two equal halves with speeds x and y, the average speed is 2xy ÷ (x + y).

Unequal Distance Segments

For unequal distances d1, d2, ... with speeds v1, v2, ..., Average Speed = (d1 + d2 + ...) ÷ (d1/v1 + d2/v2 + ...).

Unit Conversion

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

Q18. Answer: (a) 14.5

Shortcut Trick

Use the Weighted Average method for calculation.

Ratio of goods quantity = 50% : (40% of 50%) : (Remaining 30%) = 50 : 20 : 30 = 5 : 2 : 3

Overall Profit x% = (5 × 36 + 2 × 14 + 3 × (−21)) ÷ (5 + 2 + 3)

x = (180 + 28 − 63) ÷ 10 = 145 ÷ 10 = 14.5%

Therefore The correct answer is 14.5%.

Alternate Method

Given: 50% goods at 36% profit, 40% of remaining (50%) at 14% profit, and still remaining (30%) at 21% loss.

Formula Used: Overall Profit% = (Total Profit ÷ Total CP) × 100

Let the Total Cost Price (CP) of 100 units of goods be Rs. 100.

=> Case 1: CP = Rs. 50 | Profit = 36% of 50 = 50 × 0.36 = Rs. 18

=> Remaining goods = 100 − 50 = 50 units

=> Case 2: CP = 40% of 50 = 20 units | Profit = 14% of 20 = 20 × 0.14 = Rs. 2.8

=> Still Remaining goods = 50 − 20 = 30 units

=> Case 3: CP = 30 units | Loss = 21% of 30 = 30 × 0.21 = Rs. 6.3 (Loss is −6.3)

=> Total Profit = 18 + 2.8 − 6.3 = 14.5

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=> x% = (14.5 ÷ 100) × 100 = 14.5%

Therefore The correct answer is 14.5%.

Additional Information

Weighted Average Profit/Loss

Overall Profit % = (n1p1 + n2p2 + ... + n_kp_k) ÷ (n1 + n2 + ... + n_k), where n is quantity and p is profit percentage (negative for loss).

Successive Changes vs Parts

When goods are divided into parts, we use weighted averages. When one value changes multiple times, we use successive percentage formula: a + b + (ab/100).

Profit and Loss Basics

Profit % = (Profit ÷ CP) × 100 | SP = CP × (100 + P%) ÷ 100. Always calculate profit and loss on the Cost Price (CP) unless stated otherwise.

Q19. Answer: (a) 21

Shortcut Trick

The Total Sum is simply the product of the Average and the Total count of numbers.

Total Sum = Average × Number of items

Total Sum = 7 × 3 = 21

Therefore The correct answer is 21.

Alternate Method

Given:

Average of three numbers = 7

Number of quantities (n) = 3

Formula Used:

Average = (Sum of all observations) ÷ (Total number of observations)

Calculations:

=> 7 = (Sum of three numbers) ÷ 3

=> Sum of three numbers = 7 × 3

=> Sum of three numbers = 21

Therefore The correct answer is 21.

Additional Information

Arithmetic Mean

The most common type of average, calculated by adding all numbers in a set and dividing by the count of numbers.

Weighted Average

Used when different values have different levels of importance or frequency: (w1x1 + w2x2) ÷ (w1 + w2).

Average of Consecutive Numbers

For a series in Arithmetic Progression (AP), the average is simply (First Term + Last Term) ÷ 2.

Q20. Answer: (d) 5

Shortcut Trick

Use the algebraic identity: $(\text{Difference})^2 = (\text{Sum})^2 - 4 \times (\text{Product})$

=> $(\text{Difference})^2 = 27^2 - 4 \times 176$

=> $(\text{Difference})^2 = 729 - 704 = 25$

=> Difference = $\sqrt{25} = 5$

Therefore The correct answer is 5.

Alternate Method

Given: Sum of two numbers = 27, Product = 176.

Formula Used: Factorisation method to find the numbers x and y such that x + y = 27 and xy = 176.

=> Let the two positive numbers be x and y.

=> x + y = 27 and x × y = 176.

=> Factorizing 176 to find pairs whose sum is 27: 176 = 1 × 176, 2 × 88, 4 × 44, 8 × 22, 11 × 16.

=> Since 11 + 16 = 27, the numbers are 16 and 11.

=> Positive difference = 16 − 11 = 5.

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Therefore The correct answer is 5.

Additional Information

Algebraic Relationship

The core relationship between sum, product, and difference is given by $(x + y)^2 - (x - y)^2 = 4xy$.

Quadratic Equation Formulation

If sum (S) and product (P) of two numbers are known, the numbers are the roots of the quadratic equation $t^2 - St + P = 0$.

Nature of Roots

For the difference to be a rational number, the value ($Sum^2 - 4 \times Product$) must be a perfect square.

Q21. Answer: (c) Rs. 26,973

Shortcut Trick

Effective capital ratio (Investment × Time):

A : B : C = (1,21,500 × 12) : (1,02,060 × 9) : (97,200 × 6 + 72,700 × 6)

A : B : C = 14,58,000 : 9,18,540 : 10,19,400 = 24,300 : 15,309 : 16,990

Sum of ratio parts = 24,300 + 15,309 + 16,990 = 56,599 units

Total profit = Rs. 1,69,797 => 1 unit = Rs. 3

Difference (A − B) = (24,300 − 15,309) × 3 = 8,991 × 3 = Rs. 26,973.

Therefore The correct answer is Rs. 26,973.

Alternate Method

Given:

Investment of A = Rs. 1,21,500 for 12 months

Investment of B = Rs. 1,02,060 for 9 months

Investment of C = Rs. 97,200 for 6 months and (Rs. 97,200 − Rs. 24,500) = Rs. 72,700 for 6 months

Total Profit = Rs. 1,69,797

Formula: Profit Share Ratio = (Investment1 × Time1) : (Investment2 × Time2)

Calculations:

=> Equivalent Capital of A = 1,21,500 × 12 = 14,58,000

=> Equivalent Capital of B = 1,02,060 × 9 = 9,18,540

=> Equivalent Capital of C = (97,200 × 6) + (72,700 × 6) = 5,83,200 + 4,36,200 = 10,19,400

=> Ratio A : B : C = 14,58,000 : 9,18,540 : 10,19,400

=> Dividing by common factor 60: 24,300 : 15,309 : 16,990

=> Sum of ratios = 24,300 + 15,309 + 16,990 = 56,599

=> Total Profit = Rs. 1,69,797

=> Value of 1 unit = 1,69,797 ÷ 56,599 = Rs. 3

=> Difference between share of A and B = (24,300 − 15,309) units

=> Difference = 8,991 × 3 = Rs. 26,973

Therefore The correct answer is Rs. 26,973.

Additional Information

Basic Partnership Law

Profit is always distributed in the ratio of the product of Capital (C) and Time (T), i.e., P1 : P2 = C1×T1 : C2×T2.

Effective Capital for Multiple Transactions

When a partner changes investment mid-term, effective capital = (C1×T1 + C2×T2 + ...), where T is the duration for each capital amount.

Calculating Unknown Shares

Individual Profit = (Individual Ratio Part ÷ Total Ratio Sum) × Total Profit.

Q22. Answer: (c) 1,320

Shortcut Trick

Total Simple Interest for 3 years = 20% × 3 = 60%.

Total Amount = 100% (Principal) + 60% (Interest) = 160% = Rs. 5,280.

Simple Interest for 2 years = 20% × 2 = 40%.

Required SI = (5,280 ÷ 160%) × 40% = 5,280 ÷ 4 = Rs. 1,320.

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Therefore The correct answer is Rs. 1,320.

Alternate Method

Given:

Amount (A) = Rs. 5,280, Rate (R) = 20% p.a., Time (T1) = 3 years.

Formula Used:

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

Amount (A) = Principal (P) + SI = P × (1 + (R × T) ÷ 100)

Calculations:

=> 5,280 = P × (1 + (20 × 3) ÷ 100)

=> 5,280 = P × (1 + 0.6)

=> 5,280 = 1.6P

=> Principal (P) = 5,280 ÷ 1.6 = Rs. 3,300

=> Simple Interest for 2 years (T2 = 2) = (3,300 × 20 × 2) ÷ 100

=> SI = 33 × 40 = Rs. 1,320

Therefore The correct answer is Rs. 1,320.

Additional Information

Simple Interest Properties

In Simple Interest, the interest remains constant for every year as it is always calculated on the original Principal amount.

Principal Formula

The Principal can be calculated if the Amount, Rate, and Time are known: P = (A × 100) ÷ (100 + RT).

SI vs CI

For the first year (if compounded annually), Simple Interest and Compound Interest are equal for the same principal and rate.

Q23. Answer: (d) 999936

Shortcut Trick

The largest 6-digit number is 999999.

Divide 999999 by 96 to find the remainder.

999999 ÷ 96 gives a remainder of 63.

Subtract this remainder from 999999 to get the largest divisible number.

999999 − 63 = 999936.

Therefore The correct answer is 999936.

Alternate Method

Given: Divisor = 96, Largest 6-digit number = 999999.

Formula: Required Number = (Largest n-digit number) − (Remainder when largest n-digit number is divided by divisor).

=> Largest 6-digit number = 999999

=> Dividing 999999 by 96:

=> 999999 = 10416 × 96 + 63

=> Remainder = 63

=> Required number = 999999 − 63

=> Required number = 999936

Therefore The correct answer is 999936.

Additional Information

Divisibility Rule for 96

A number is divisible by 96 if it is divisible by both 3 (sum of digits) and 32 (last 5 digits divisible by 32).

Smallest n-digit number divisible by x

Required number = Smallest n-digit number + (x − remainder), where remainder is obtained by dividing the smallest n-digit number by x.

Division Algorithm

Dividend = (Divisor × Quotient) + Remainder. For perfect divisibility, the remainder must be zero.

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Q24. Answer: (d) 49.16%

Shortcut Trick

Assume the initial price of fuel is 100.

Final Price = 100 × (0.55) × (0.75) × (0.85) × (1.45)

Final Price = 100 × 0.50840625 = 50.840625

Net percentage decrease = 100 − 50.840625 = 49.159375%

Rounding to 2 decimal places, we get 49.16%.

Therefore The correct answer is 49.16%.

Alternate Method

Given:

Initial changes: 45% decrease, 25% decrease, 15% decrease.

Fourth month change: 45% increase.

Formula Used:

Final Value = Initial Value × (1 − r1/100) × (1 − r2/100) × (1 − r3/100) × (1 + r4/100)

Calculations:

=> Let Initial Price = 100

=> Price after 1st month = 100 − 45% of 100 = 55

=> Price after 2nd month = 55 − 25% of 55 = 55 − 13.75 = 41.25

=> Price after 3rd month = 41.25 − 15% of 41.25 = 41.25 − 6.1875 = 35.0625

=> Price after 4th month = 35.0625 + 45% of 35.0625 = 35.0625 + 15.778125 = 50.840625

=> Net Percentage Decrease = 100 − 50.840625 = 49.159375%

=> Rounding to two decimal places = 49.16%

Therefore The correct answer is 49.16%.

Additional Information

Successive Percentage Change

For two successive changes of a% and b%, the net change is given by (a + b + ab/100)%. Use negative values for decrease.

Multiplying Factor Concept

To find the final value after an x% change, multiply the base by (1 ± x/100). For multiple changes, multiply all factors sequentially.

Rounding Rules

When rounding to 2 decimal places, if the third decimal digit is 5 or greater, round up the second digit.

Q25. Answer: (a) 35%

Shortcut Trick

Let Cost Price (CP) = 100.

Marked Price (MP) = 100 + 120 = 220.

To gain 43%, Selling Price (SP) must be 143.

Discount needed = MP − SP = 220 − 143 = 77.

Discount % = (77 ÷ 220) × 100 = 35%.

Therefore The correct answer is 35%.

Alternate Method

Given:

Markup = 120% above Cost Price (CP)

Required Gain (Profit) = 43%

Formula Used:

1. Marked Price (MP) = CP × (100 + Markup%) ÷ 100

2. Selling Price (SP) = CP × (100 + Profit%) ÷ 100

3. Discount % = [(MP − SP) ÷ MP] × 100

Calculations:

=> Let CP = 100

=> MP = 100 + (120% of 100) = 100 + 120 = 220

=> SP = 100 + (43% of 100) = 100 + 43 = 143

=> Discount = MP − SP = 220 − 143 = 77

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=> Discount % = (77 ÷ 220) × 100

=> Discount % = (7 ÷ 20) × 100 = 7 × 5 = 35%

Therefore The correct answer is 35%.

Additional Information

Relationship between CP and MP

The ratio of Cost Price to Marked Price is directly related to the profit and discount: CP ÷ MP = (100 − Discount%) ÷ (100 + Profit%).

Net Percentage Change Formula

The overall profit or loss can be calculated using the successive percentage change formula: Net % = Markup − Discount − (Markup × Discount ÷ 100).

Discount Calculation

Discount is always calculated on the Marked Price. Discount = MP − SP. Discount % = (Discount ÷ MP) × 100.

Q26. Answer: (b) Rs. 4,000

Shortcut Trick

The effective price after successive discounts is: MP × 70% × 88% = SP.

MP × 0.7 × 0.88 = Rs. 2,464

MP × 0.616 = Rs. 2,464

MP = 2,464 ÷ 0.616 = Rs. 4,000.

Therefore The correct answer is Rs. 4,000.

Alternate Method

Given:

Trade Discount = 30%

Scheme Discount = 12%

Selling Price (SP) = Rs. 2,464

Formula Used:

Final SP = MP × (100 − d1)/100 × (100 − d2)/100

Calculations:

=> Let the Marked Price (MP) of the electric kettle be M.

=> Price after 30% trade discount = M × (100 − 30) ÷ 100 = 0.70M.

=> Final Selling Price after 12% scheme discount = 0.70M × (100 − 12) ÷ 100.

=> 2,464 = 0.70M × 0.88

=> 2,464 = 0.616 × M

=> M = 2,464 ÷ 0.616

=> M = 4,000

Therefore The correct answer is Rs. 4,000.

Additional Information

Single Equivalent Discount

For two successive discounts of a% and b%, the single equivalent discount is [a + b − (a × b)/100]%.

Relation between MP and CP

The ratio between Marked Price and Cost Price is given by: MP/CP = (100 + Profit%)/(100 − Discount%).

Basis of Discount

A discount (whether trade or scheme) is always calculated on the current Marked Price or the preceding balance price in a chain.

Q27. Answer: (b) 158

Shortcut Trick

Break the expression into three parts: Part 1 is √36 = 6.

Part 2 is √(324 ÷ 81) = √4 = 2.

Part 3: Count decimal places. Top has 6, Bottom has 8. Net adjustment is 10^2 in the numerator.

Simplify: √[(95 ÷ 19) × (85 ÷ 17) × (189 ÷ 21) × 100] = √(5 × 5 × 9 × 100) = 150.

Total Sum = 6 + 2 + 150 = 158.

Therefore The correct answer is 158.

Alternate Method

Given Expression: √36 + √(324 ÷ 81) + √((9.5 × 0.0085 × 18.9) ÷ (0.021 × 0.0017 × 1.9))

The expression involves square roots and decimal simplification. We solve each term step-by-step:

=> Term 1: √36 = 6

=> Term 2: √(324 ÷ 81) = √4 = 2

=> Term 3: To simplify √((9.5 × 0.0085 × 18.9) ÷ (0.021 × 0.0017 × 1.9)), remove decimals by multiplying both numerator and denominator by 10^8.

=> √((95 × 85 × 189 × 100) ÷ (21 × 17 × 19))

=> √((95 ÷ 19) × (85 ÷ 17) × (189 ÷ 21) × 100)

=> √(5 × 5 × 9 × 100)

=> √(22500) = 150

Now, add all the simplified values obtained from the steps above:

=> 6 + 2 + 150 = 158

Therefore The correct answer is 158.

Additional Information

BODMAS Rule

Always prioritize Orders (roots and exponents) before addition and subtraction to ensure correct arithmetic evaluation.

Decimal Shift in Fractions

When dividing decimals, shift the decimal point to the right in both the numerator and denominator by the same number of places to simplify into whole numbers.

Square Root of Products

The property √(a × b × c) = √a × √b × √c allows for the factorization of large numbers under a root for easier calculation.

Q28. Answer: (c) 10 years

Shortcut Trick

Ratio 5 years ago (M:S) = 7 : 1 (Difference = 6 units)

Current Ratio (M:S) = 4 : 1 (Difference = 3 units)

Equalize differences by multiplying current ratio by 2 → 8 : 2

Change in son's age units from 5 years ago to now = 2 − 1 = 1 unit → 5 years

Son's present age = 2 units = 2 × 5 = 10 years.

Therefore The correct answer is 10 years.

Alternate Method

Given:

Current age of man is four times the age of his son.

Five years ago, the man was seven times older than his son.

Formula Used:

Age difference and ratio calculation using linear equations.

Calculations:

=> Let the son's present age be S years.

=> Therefore, the man's present age is 4S years.

=> Five years ago, son's age = (S − 5) years.

=> Five years ago, man's age = (4S − 5) years.

=> According to the condition: (4S − 5) = 7 × (S − 5)

=> 4S − 5 = 7S − 35

=> 35 − 5 = 7S − 4S

=> 30 = 3S

=> S = 10

Therefore The correct answer is 10 years.

Additional Information

Age Difference Constant Rule

The numerical difference between the ages of two people always remains the same, regardless of how many years pass.

Ratio Scaling

When solving age problems using ratios, always ensure the unit difference between the two ratios is equalized relative to the time

gap.

General Age Formula

If the present age is X, then age 'n' years ago is (X − n) and age after 'n' years is (X + n).

Q29. Answer: (d) 10,332

Shortcut Trick

Ratio of Cost Price (CP) for P to Q = 100 : 125 = 4 : 5

Ratio of CP for Q to R = 100 : 40 = 5 : 2

Combined ratio P : Q : R = 4 : 5 : 2

Given R paid 2 units = Rs. 5,166

1 unit = Rs. 2,583 => P purchased for 4 units = 4 × 2,583 = Rs. 10,332

Therefore The correct answer is Rs. 10,332.

Alternate Method

Given:

Price paid by R = Rs. 5,166

Profit percentage of P = 25%

Loss percentage of Q = 60%

Formula Used:

Selling Price (SP) = Cost Price (CP) × (100 ± Profit/Loss%)/100

Calculations:

=> Let the purchase price of the item for P be x.

=> P sells it to Q at 25% profit, so CP of Q = x × (125/100) = 1.25x

=> Q sells it to R at 60% loss, so CP of R = 1.25x × (1 − 60/100)

=> CP of R = 1.25x × 0.40 = 0.5x

=> Given that R paid Rs. 5,166, therefore: 0.5x = 5,166

=> x = 5,166 ÷ 0.5 = 5,166 × 2

=> x = 10,332

Therefore The correct answer is Rs. 10,332.

Additional Information

Successive Percentage Change

When a value changes by a% and then by b%, the effective percentage change is given by (a + b + ab/100)%.

Fractional Conversion

Profit of 25% is equivalent to a multiplier of 5/4 (1 + 1/4), and a loss of 60% is equivalent to a multiplier of 2/5 (1 − 3/5).

Final Price Formula

Final Price = Initial Price × (100 ± r1)/100 × (100 ± r2)/100 × ... × (100 ± r_n)/100.

Q30. Answer: (c) 300

Shortcut Trick

In a standard 30°−60°−90° right-angled triangle, the ratio of sides opposite to the angles is 1 : √3 : 2.

The side opposite to 30° (building height) corresponds to 1 unit = 100√3 m.

The side opposite to 60° (horizontal distance) corresponds to √3 units.

=> Horizontal distance = 100√3 × √3 = 300 m.

Therefore The correct answer is 300 m.

Alternate Method

Given:

Height of the building (AB) = 100√3 m

Angle of depression from the top of the building to the bicycle = 30°

Since the horizontal ground is parallel to the horizontal line of sight from the top, the angle of elevation of the top of the building from the bicycle (Angle ACB) = 30° (alternate interior angles).

Let the horizontal distance from the base of the building to the bicycle (BC) = d

Formula Used:

In a right-angled triangle ABC:

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tan(θ) = Opposite Side ÷ Adjacent Side

Calculations:

In right-angled triangle ABC:

=> tan(30°) = AB ÷ BC

=> 1 ÷ √3 = 100√3 ÷ d

=> d = 100√3 × √3

=> d = 100 × 3

=> d = 300 m

Therefore The correct answer is 300 m.

Additional Information

Angle of Elevation and Depression

The angle of elevation is measured upwards from the horizontal line, while the angle of depression is measured downwards. They are equal in magnitude because of alternate interior angles.

Standard Trigonometric Ratios for Height & Distance

Common ratio values to remember: tan(30°) = 1/√3, tan(45°) = 1, and tan(60°) =

Q31. Answer: (d) Rs. 50,000

The correct answer is Rs. 50,000.

Key Points

• In a landmark ruling in 2025, the Supreme Court of India reinforced the financial security of women by setting a permanent monthly alimony benchmark of Rs. 50,000 for a divorced wife who remains unmarried.

• The Apex Court emphasized that maintenance is not a matter of charity but a fundamental right derived from the principle of Social Justice, ensuring that a woman is not left in a state of destitution after the dissolution of marriage.

• The judgment clarified that the amount of Rs. 50,000 was determined considering the rising Cost of Living and the Inflation Index, aiming to provide a basic standard of living that aligns with the husband's financial status and the wife's previous lifestyle.

• This decision is rooted in the interpretation of Section 125 of the Criminal Procedure Code (CrPC), now integrated into the Bharatiya Nagarik Suraksha Sanhita (BNSS), which mandates the husband to provide support to a wife who is unable to maintain herself.

• The court highlighted that the 'unmarried' status of the divorced wife necessitates continuous support until her remarriage or change in financial circumstances, making the Rs. 50,000 sum a fixed monthly obligation for the respondent.

Additional Information

• Permanent Alimony:

• It refers to the allowance ordered by the court to be paid by one spouse to the other after the Decree of Divorce is passed.

• Under Section 25 of the Hindu Marriage Act, 1955, the court has the authority to grant permanent alimony and maintenance at the time of passing any decree.

• Factors Influencing Alimony Quantum:

• Standard of Living: The Supreme Court has consistently held that a wife is entitled to the same comfort level she enjoyed in her Matrimonial Home.

• Financial Capacity: The Net Taxable Income, assets, and liabilities of the husband are critical determinants for the final amount.

• Duration of Marriage: Longer durations often lead to higher alimony settlements due to the increased dependency established over time.

• Interim Maintenance:

• Distinguished from permanent alimony, this is the amount paid during the pendency of the Matrimonial Suit to cover immediate legal and living expenses.

Q32. Answer: (c) President of India

The correct answer is President of India.

Key Points

• The Speaker Pro Tem is a temporary post created to preside over the first few sittings of a newly elected Lok Sabha until a permanent Speaker is elected.

• According to Article 99 of the Indian Constitution, every member of either House of Parliament must, before taking their seat, make and subscribe an oath or affirmation before the President or some person appointed by him.

• The President of India appoints the Speaker Pro Tem and administers the oath of office to him/her, usually at the Rashtrapati Bhavan, before the first session of the new House begins.

• By convention, the most senior member of the Lok Sabha (in terms of number of years/terms served) is chosen for this position

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to ensure the smooth transition of parliamentary proceedings.

• The primary duties of the Speaker Pro Tem include presiding over the first meeting of the Lok Sabha, administering the oath to all other newly elected members, and enabling the election of the permanent Speaker.

Additional Information

• Chief Justice of India:

• Responsible for administering the oath of office to the President of India under Article 60.

• Does not have a constitutional role in the administration of oaths for members of the Legislature.

• Vice President of India:

• Acts as the Ex-officio Chairman of the Rajya Sabha.

• The oath of the Vice President is administered by the President or a person appointed by him.

• Cabinet Secretary:

• The highest-ranking civil servant and the administrative head of the Cabinet Secretariat.

• Functions as the chief coordinator of the Government of India but holds no constitutional authority regarding parliamentary oaths.

• Nature of Office:

• The office of Speaker Pro Tem is strictly temporary and ceases to exist the moment the House elects its permanent Speaker under Article 93.

Q33. Answer: (a) Konkan → Karnataka → Malabar

The correct answer is Konkan → Karnataka → Malabar.

Key Points

• The Western Coastal Plain of India is a narrow strip of land situated between the Western Ghats and the Arabian Sea, extending from the Gulf of Kachchh in the north to Kanyakumari in the south.

• The Konkan Coast constitutes the northern segment of the western coastline. It stretches from Daman in the north to Goa in the south, covering the coastal districts of Maharashtra and Goa. It is characterized by a rugged and indented coastline.

• The Karnataka Coast, also referred to as the Kanara Coast, is the middle section located south of the Konkan region. It extends from Goa to Mangalore along the state of Karnataka.

• The Malabar Coast forms the southernmost part of the western coastal plains, stretching from Mangalore to the southern tip of the peninsula at Kanyakumari. This region primarily falls within the state of Kerala and is known for its extensive backwaters or Kayals.

• Therefore, the correct geographical sequence from north to south along the western coast is the Konkan Coast, followed by the Karnataka Coast, and finally the Malabar Coast.

Additional Information

• Kathiawar Coast:

• This section is located in Gujarat, specifically around the Saurashtra peninsula. It lies to the north of the Konkan Coast and is bounded by the Gulf of Kachchh and the Gulf of Khambhat.

• Comparison with the Eastern Coast:

• The Eastern Coastal Plain is broader than the western coast and is divided into the Northern Circars (between the Mahanadi and Krishna rivers) and the Coromandel Coast (stretching from the Krishna river to Kanyakumari).

• Geomorphological Features:

• The western coast is an example of a submerged coast, which provides natural deep-water harbors. Major ports such as Kandla, Mumbai, Marmagao, and Kochi are located along this coastline.

Q34. Answer: (c) Application software

The correct answer is Application software.

Key Points

• Application software consists of programs designed to perform specific tasks for users, rather than simply managing the computer system itself.

• Microsoft Word is categorized as a word processor used for creating, editing, and formatting text documents.

• Microsoft Excel is a spreadsheet application utilized for data organization, mathematical calculations, and financial analysis using a grid of cells.

• Microsoft PowerPoint is a presentation program that allows users to create visual slide decks for business or educational purposes.

• These programs are considered end-user software because they allow individuals to produce specific outputs like documents, charts, and presentations.

• Application software requires an Operating System to run, as it does not communicate directly with the computer hardware.

Additional Information

• System software:

• Responsible for managing and controlling the hardware components so that application software can perform its tasks.

• Core examples include Operating Systems (OS) like Windows 11, Linux, and macOS, as well as utility software like disk defragmenters.

• Hardware components:

• The physical, tangible parts of a computer system such as the Central Processing Unit (CPU), Hard Disk Drive (HDD), and Monitor.

• Booting programs:

• Specific sets of instructions, such as the BIOS (Basic Input/Output System) or UEFI, that load the operating system into the RAM when the computer is turned on.

Q35. Answer: (d) Mesolithic

The correct answer is Mesolithic.

Key Points

• The Mesolithic phase, also referred to as the Middle Stone Age, represents a transitional period between the Palaeolithic and Neolithic eras, beginning approximately around 10,000 BCE in India.

• The most defining technological advancement of this period was the production of microliths, which are tiny, highly specialized stone tools made from crypto-crystalline silica such as chert, chalcedony, agate, and jasper.

• These tools are typically very small, ranging from 1 cm to 8 cm in length, and are classified into geometrical shapes (like triangles, trapezes, and lunates or crescents) and non-geometrical shapes.

• Microliths were rarely used alone; they were designed to be hafted into wooden or bone handles to create composite tools like spearheads, arrowheads, knives, and sickles.

• In the Indian context, major Mesolithic sites include Bagor in Rajasthan (one of the largest Mesolithic sites), Adamgarh in Madhya Pradesh, Langhnaj in Gujarat, and Sarai Nahar Rai in Uttar Pradesh.

• This era witnessed a shift towards more efficient hunting-gathering and the early beginnings of animal domestication, as evidenced by findings at Bagor and Adamgarh.

Additional Information

• Lower Palaeolithic

• Characterized by the Acheulian culture involving large, heavy stone tools.

• Common implements included hand-axes, cleavers, and choppers used for butchering and digging.

• Middle Palaeolithic

• Marked by a transition to flake-based tool industries.

• Key tools included scrapers, borers, and points made using the Levallois technique.

• Early Iron Age

• Associated with the introduction of iron metallurgy following the Bronze Age.

• In India, this period is often linked with the Painted Grey Ware (PGW) culture in the North and Megalithic cultures in the South.

Q36. Answer: (c) Gandhi-Irwin Pact

The correct answer is Gandhi-Irwin Pact.

Key Points

• The Gandhi-Irwin Pact was a landmark political agreement signed on March 5, 1931, between Mahatma Gandhi and the Viceroy of India, Lord Irwin, before the Second Round Table Conference in London.

• The pact led to the suspension of the Civil Disobedience Movement, which had gained massive momentum following the Salt Satyagraha and the Dandi March of 1930.

• Key provisions of the pact included the release of all political prisoners not charged with violence, the return of confiscated properties to their owners, and the right of people in coastal villages to make salt for personal consumption without paying tax.

• In exchange, the Indian National Congress agreed to discontinue the movement and participate in the Second Round Table Conference to discuss constitutional reforms for India.

• The pact was significant as it placed the Indian National Congress on an equal footing with the British Government for the first time during negotiations.

Additional Information

• Poona Pact (1932):

• This was an agreement between Mahatma Gandhi and Dr. B.R. Ambedkar on behalf of the depressed classes and upper-caste Hindus.

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• It resulted in the reservation of seats for the Depressed Classes in provincial and central legislatures instead of separate electorates.

• Lucknow Pact (1916):

• An agreement reached between the Indian National Congress and the All India Muslim League at a joint session held in Lucknow.

• It established a joint front to demand self-government from the British and accepted the principle of separate electorates for Muslims.

• Lahore Session (1929):

• Presided over by Jawaharlal Nehru, this session is famous for passing the resolution of Purna Swaraj or Complete Independence, which set the stage for the Civil Disobedience Movement.

Q37. Answer: (b) It was intended to divide people on communal lines and weaken the growing nationalist movement.

The correct answer is It was intended to divide people on communal lines and weaken the growing nationalist movement..

Key Points

• The Partition of Bengal was announced on July 19, 1905, by the then Viceroy of India, Lord Curzon, and it officially came into effect on October 16, 1905.

• While the British administration cited administrative convenience as the official reason, the actual strategic intent was to stifle the rising tide of Indian nationalism, as Bengal was the nerve center of political consciousness and anti-colonial resistance.

• The territorial reorganization was designed to create a communal rift by establishing a Muslim-majority province in the East (Eastern Bengal and Assam) and a Hindu-majority province in the West (Western Bengal, Bihar, and Odisha).

• By making the Bengali-speaking population a minority in their own province and fostering religious divisions, the colonial government aimed to implement the classic Divide and Rule policy to weaken the unified front of the Indian National Congress.

• Nationalist leaders recognized this as a deliberate attempt to destroy Bengali unity and communal harmony, leading to the launch of the Swadeshi and Boycott movements, which marked a new phase in the struggle for Swaraj.

Additional Information

• Swadeshi Movement:

• It was a direct reaction to the 1905 Partition, emphasizing the use of indigenous goods and the burning of foreign-made cloth to exert economic pressure on the British.

• 1911 Annulment:

• Due to the intense and sustained political agitation, the partition was eventually annulled by Lord Hardinge during the Delhi Durbar in 1911.

• Administrative Rationale:

• The British argued that the Bengal Presidency was too large, with a population of nearly 78 million, making it difficult for a single Lieutenant-Governor to manage effectively.

• Shift of Capital:

• In 1911, alongside the annulment of the partition, the British shifted the capital of colonial India from Calcutta to Delhi to ensure better administrative control and move away from the revolutionary hotbed of Bengal.

Q38. Answer: (c) Protozoan

The correct answer is Protozoan.

Key Points

• Malaria is a life-threatening infectious disease caused by parasites of the genus Plasmodium. These parasites are microscopic, single-celled eukaryotic organisms classified as protozoans.

• The infection is primarily transmitted to humans through the bite of an infected female Anopheles mosquito. The mosquito serves as the vector, carrying the parasite from one human host to another.

• During the bite, the mosquito injects the parasite in the form of sporozoites into the bloodstream. These sporozoites travel to the liver, where they mature and multiply.

• After the liver stage, the parasites (now called merozoites) enter the red blood cells (erythrocytes). Their multiplication inside these cells leads to the destruction of the red blood cells, which is a hallmark of the disease.

• The clinical symptoms, including recurring high fever, chills, and sweating, are caused by the release of a metabolic waste product called hemozoin when the infected red blood cells rupture.

Additional Information

• Bacteria:

• These are prokaryotic organisms that cause diseases such as Typhoid, Tuberculosis, and Cholera. Unlike malaria, bacterial infections are generally treated with antibiotics.

• Fungi:

• Fungi are eukaryotic organisms that include yeasts and molds. They are responsible for common skin diseases like Ringworm and Athlete's foot, but they do not cause malaria.

• Virus:

• Viruses are non-living infectious particles that require a host cell to replicate. They cause diseases like Dengue, Hepatitis, and COVID-19. While Dengue is also mosquito-borne, its pathogen is a virus, not a protozoan.

• There are several species of Plasmodium that cause malaria in humans, including P. falciparum, P. vivax, P. ovale, and P. malariae, with P. falciparum being the most lethal.

Therefore, the pathogen responsible for the transmission and development of malaria is a protozoan.

Q39. Answer: (c) Hubballi

The correct answer is Hubballi.

Key Points

• The South Western Railway (SWR) is one of the 19 railway zones in India, which was created by reorganizing the existing Southern Railway and South Central Railway zones.

• The zone officially commenced its operations on April 1, 2003, with its headquarters established in Hubballi (formerly known as Hubli) in the state of Karnataka.

• Geographically, the South Western Railway zone covers a vast majority of the railway network in Karnataka, and extends its jurisdiction to parts of Tamil Nadu, Andhra Pradesh, and Goa.

• The administrative structure of this zone is divided into three functional divisions: Hubballi, Bengaluru, and Mysuru.

• Hubballi is a significant railway landmark, as it houses one of the oldest and largest Carriage and Wagon Workshops in the Indian Railways network, established in 1885.

• The city is also home to the Shree Siddharoodha Swamiji Hubballi Junction, which holds the record for the world s longest railway platform as of 2023.

Additional Information

• Jaipur:

• It serves as the headquarters of the North Western Railway (NWR) zone.

• This zone was also formed in 2002 and comprises divisions like Jaipur, Ajmer, Bikaner, and Jodhpur.

• Mumbai:

• Mumbai is a major railway nerve center, hosting the headquarters for two zones: the Central Railway (CR) at Chhatrapati Shivaji Maharaj Terminus and the Western Railway (WR) at Churchgate.

• Jabalpur:

• Located in Madhya Pradesh, it is the headquarters of the West Central Railway (WCR) zone.

• The WCR zone includes the Jabalpur, Bhopal, and Kota divisions.

Q40. Answer: (d) It resulted from reduced trade and rising land grants replacing cash payments.

The correct answer is It resulted from reduced trade and rising land grants replacing cash payments..

Key Points

• The post-Gupta period (6th century CE to 1000 CE) was characterized by a distinct shift from a centralized monetary economy to a decentralized agrarian structure.

• A primary cause for the decline in metallic coinage was the slump in long-distance trade, particularly with the Roman Empire and Central Asia, which reduced the influx of gold and silver.

• Economic historians like R.S. Sharma argue that the emergence of Indian Feudalism led to the practice of land grants. Rulers began donating land to Brahmins (Agraharas) and state officials as a substitute for cash salaries.

• This transition promoted a closed, self-sufficient village economy where local production met local needs, significantly diminishing the necessity for a circulating metallic currency for daily transactions.

Additional Information

• Currency Alternatives:

• While high-value gold and silver coins became scarce, cowrie shells (shells used as money) and copper coins became the standard medium for small-scale local exchange.

• Gupta Coinage:

• The Gupta Dynasty was famous for its high-quality gold coins (Dinaras); however, toward the end of their rule, coins showed increasing debasement (mixing gold with inferior metals), signaling economic distress.

• Urban Decay:

• The decline of trade led to urban centers falling into ruin, forcing merchants and artisans to move to rural areas, which further solidified land-based wealth over monetary wealth.

Q41. Answer: (b) 2003

The correct answer is 2003.

Key Points

• The 89th Constitutional Amendment Act was enacted in the year 2003 to bifurcate the combined National Commission for Scheduled Castes and Scheduled Tribes.

• This amendment specifically aimed at creating a dedicated National Commission for Scheduled Castes (NCSC) under Article 338 of the Indian Constitution.

• The act also inserted a new Article 338A, which led to the establishment of the National Commission for Scheduled Tribes (NCST).

• This legislative change was passed by the Parliament in 2003 and received the Presidential assent shortly thereafter, officially coming into force on February 19, 2004.

• Before this amendment, the 65th Constitutional Amendment Act, 1990 had replaced the one-man Special Officer with a multi-member National Commission for SCs and STs.

Additional Information

• National Commission for Scheduled Castes (NCSC):

• It is a constitutional body responsible for safeguarding the interests of the Scheduled Castes in India.

• The commission consists of a Chairperson, a Vice-Chairperson, and three other members, all of whom are appointed by the President of India by warrant under his hand and seal.

• Their primary function is to investigate and monitor all matters relating to the safeguards provided for the Scheduled Castes under the Constitution or any other law.

• The commission has all the powers of a civil court while investigating any matter or inquiring into any complaint.

• Reasons for Bifurcation:

• The social and educational conditions of Scheduled Tribes were considered significantly different from Scheduled Castes, as STs often face issues related to geographical isolation and cultural preservation, whereas SCs face issues related to social exclusion like untouchability.

• Separating the commissions allowed for a more focused approach toward the specific development and welfare schemes tailored for each group.

Therefore, the correct option is 2.

Q42. Answer: (d) Only 2, 3 and 4

The correct answer is Only 2, 3 and 4.

Key Points

• Marathi: As of December 2022, this language did not hold the official classical status. Although the Maharashtra Government submitted a proposal based on the Rangnath Pathare Committee report, the Union Cabinet only granted it Classical Language status later in October 2024. Hence, statement 1 is incorrect.

• Tamil: It was the very first language in India to be accorded the Classical Language status in 2004. The criteria for this selection include high antiquity of early texts and a recorded history spanning over 1500 to 2000 years. Hence, statement 2 is correct.

• Sanskrit: This language was declared classical in 2005. It is recognized for its extraordinary contribution to Indian heritage, particularly through the Vedas, Upanishads, and classical literature that influenced several other linguistic traditions. Hence, statement 3 is correct.

• Odia: It was officially added to the list in February 2014, becoming the sixth language to receive this distinction. It was the first language from the Indo-Aryan group, other than Sanskrit, to be recognized as classical during that period. Hence, statement 4 is correct.

Additional Information

• As of December 2022, there were a total of six languages recognized as classical by the Ministry of Culture:

• Tamil (declared in 2004).

• Sanskrit (declared in 2005).

• Kannada (declared in 2008).

• Telugu (declared in 2008).

• Malayalam (declared in 2013).

• Odia (declared in 2014).

• The Linguistic Experts Committee, constituted by the Ministry of Culture, evaluates the eligibility of languages based on original literary traditions that are not borrowed from another speech community.

• Benefits of this status include the establishment of a Center of Excellence for Studies in Classical Languages and the provision for the University Grants Commission (UGC) to create professional chairs in Central Universities for these specific languages.

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Q43. Answer: (d) Geneva, Switzerland

The correct answer is Geneva, Switzerland.

Key Points

• The 353rd Session of the Governing Body of the International Labour Organization (ILO) is scheduled to be held in March 2025.

• This session, like most regular meetings of the executive council, takes place at the ILO Headquarters in Geneva, Switzerland.

• The Governing Body is the executive organ of the ILO and meets three times a year, specifically in March, June, and October/November, to make decisions on ILO policy, the agenda of the International Labour Conference, and the draft Programme and Budget.

• During these sessions, representatives discuss global labor standards, the protection of workers rights, and the implementation of international labor conventions.

Additional Information

• International Labour Organization (ILO):

• It was founded in 1919 under the Treaty of Versailles as an affiliated agency of the League of Nations.

• In 1946, it became the first specialized agency associated with the United Nations (UN).

• The organization is unique due to its tripartite structure, which involves governments, employers, and workers from 187 Member States in its decision-making processes.

• The ILO was awarded the Nobel Peace Prize in 1969 for its work in improving fraternity and peace among nations through social justice.

• The current Director-General of the ILO (as of 2024-2025) is Gilbert F. Houngbo, who was elected by the Governing Body.

Q44. Answer: (c) Madhya Pradesh

The correct answer is Madhya Pradesh.

Key Points

• The Khelo India Water Sports Festival 2025 was officially organized in Srinagar, Jammu and Kashmir, primarily hosted at the Water Sports Center located on the banks of Nigeen Lake and Dal Lake.

• Madhya Pradesh emerged as the dominant force in the competition, securing the highest number of gold medals across various aquatic disciplines, which cemented its position at the top of the overall medal tally.

• The state contingent displayed exceptional prowess in Canoeing, Kayaking, and Rowing, sweeping several podium finishes in both the men's and women's categories.

• This victory is a testament to the state's focused investment in aquatic sports, outperforming other prominent states like Kerala and Maharashtra that have traditionally been strong in water-based events.

• The festival was part of the Khelo India initiative by the Ministry of Youth Affairs and Sports, aimed at promoting specialized sporting disciplines and identifying Olympic-level talent at the grassroots level.

Additional Information

• Infrastructure and Training Excellence:

• The Madhya Pradesh State Water Sports Academy, based in Bhopal, is credited with the state's success; it provides international-standard high-performance training and features world-class equipment for athletes.

• The academy has a history of producing athletes who represent India at the Asian Games and World Championships, particularly in Slalom and Sprint events.

• The 2025 Festival in Srinagar served as a crucial qualifying and scouting ground for upcoming national and international aquatic championships.

• While Kerala is famous for its Vallam Kali (Snake Boat Race) and Maharashtra for its coastal sports, Madhya Pradesh has successfully created a systematic technical training model that prioritizes Olympic-format water sports.

Q45. Answer: (a) Climate Smart Cities Assessment Framework

The correct answer is Climate Smart Cities Assessment Framework.

Key Points

• The Climate Smart Cities Assessment Framework (CSCAF) was launched in February 2019 by the Ministry of Housing and Urban Affairs (MoHUA) as a part of the Smart Cities Mission.

• It serves as a first-of-its-kind public assessment tool designed to provide a clear roadmap for Indian cities to combat climate change through planned investments and policy interventions.

• The framework evaluates urban performance across 28 indicators categorized into five key thematic areas: Energy and Green Buildings, Urban Planning, Green Cover & Biodiversity, Mobility and Air Quality, Water Management, and Waste Management.

• By using this framework, cities can assess their current climate situation and adopt data-driven strategies to improve their climate resilience and overall sustainability.

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• The second version, CSCAF 2.0, was later launched in September 2020 to further refine the assessment parameters and encourage broader participation from 126 cities, including all Smart Cities and capital cities.

Additional Information

• National Action Plan on Climate Change (NAPCC)

• Launched in June 2008, it is a comprehensive strategy created by the Prime Minister Council on Climate Change to address the challenges of global warming.

• It outlines eight national missions focusing on solar energy, enhanced energy efficiency, sustainable habitat, water, Himalayan ecosystems, green India, sustainable agriculture, and strategic knowledge for climate change.

• National Mission on Sustainable Habitat (NMSH)

• Approved in 2010, it is one of the eight core missions under the NAPCC framework managed by the MoHUA.

• It focuses on making cities sustainable by promoting energy efficiency in the residential and commercial sectors, improving urban waste management, and enhancing public transport systems.

Q46. Answer: (b) Step-wells for water conservation

The correct answer is Step-wells for water conservation.

Key Points

• Dholavira, located on Khadir Bet island in the Kutch Desert Wildlife Sanctuary of Gujarat, is distinguished by its extraordinary water management system.

• Archaeologists discovered a massive, rectangular step-well at the site, measuring approximately 73.4 meters in length, 29.3 meters in width, and 10 meters in depth.

• This prehistoric step-well is nearly three times the size of the Great Bath at Mohenjo-daro and represents one of the earliest and most sophisticated examples of hydraulic engineering in the ancient world.

• The site features a series of 16 interconnected reservoirs and stone-cut dams designed to conserve every drop of rainwater in an otherwise arid environment.

• The presence of these rock-cut water structures highlights the transition from simple well-culture to advanced water harvesting, making it a unique architectural hallmark of this specific Harappan city.

Additional Information

• City Planning and Structure:

• Unlike most Harappan cities which were divided into two parts (the Citadel and the Lower Town), Dholavira was uniquely divided into three sections: the Citadel, the Middle Town, and the Lower Town.

• The city was protected by massive stone fortifications, whereas most other Indus sites primarily used mud-bricks for defensive walls.

• The Dholavira Signboard:

• One of the most significant archaeological finds at the site is a large inscription consisting of ten large-sized signs of the Harappan script, often called the Dholavira Signboard.

• This discovery is unique because most Indus Valley scripts are found on small seals or pottery fragments rather than large public displays.

• General Harappan Features:

• While complex drainage systems and large fortifications are present in Dholavira, they are common traits across major sites like Harappa, Mohenjo-daro, and Kalibangan.

• Pictorial murals are not a standard architectural feature of the Indus Valley Civilization, which focused more on terracotta figurines and steatite seals.

Q47. Answer: (c) Provide rural road connectivity

The correct answer is Provide rural road connectivity.

Key Points

• The Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched on 25th December 2000 by the Government of India under the leadership of the then Prime Minister Atal Bihari Vajpayee.

• It is a Centrally Sponsored Scheme implemented by the Ministry of Rural Development to provide all-weather road access to unconnected rural habitations.

• The primary mandate is to provide a single all-weather road (with necessary culverts and cross-drainage structures) that is operable throughout the year.

• The scheme specifically targets habitations with a population size of 500 persons and above in plain areas and 250 persons and above in Hill States, Desert Areas, Tribal Areas, and Backward Districts.

• By improving rural road connectivity, the initiative aims to facilitate better access to markets, healthcare, education, and other essential social services, thereby reducing rural poverty.

• The program has expanded through subsequent phases such as PMGSY-II (launched in 2013) and PMGSY-III (approved in 2019) to consolidate and upgrade the existing Rural Through Routes.

Additional Information

• Build national highways:

• National highways are managed by the Ministry of Road Transport and Highways (MoRTH) and the National Highways Authority of India (NHAI).

• The Bharatmala Pariyojana is the flagship program focused on the development of economic corridors and international connectivity.

• Connect Waterways:

• The development of inland waterways is governed by the Inland Waterways Authority of India (IWAI) under the National Waterways Act, 2016.

• The Sagarmala Project focuses on port-led development and optimizing the use of India's coastline and navigable rivers.

• Promote bullet trains:

• High-speed rail development is the responsibility of the National High Speed Rail Corporation Limited (NHSRCL) under the Ministry of Railways.

• The Mumbai-Ahmedabad High Speed Rail (MAHSR) is India's first sanctioned bullet train project.

Q48. Answer: (b) To control fiscal deficits

The correct answer is To control fiscal deficits.

Key Points

• The Fiscal Responsibility and Budget Management (FRBM) Act was enacted in August 2003 to institutionalize financial discipline and reduce the fiscal deficit of the Indian government.

• Its primary objective is to ensure inter-generational equity in fiscal management and long-term macro-economic stability by achieving a balanced budget over time.

• The Act originally mandated the Central Government to reduce the fiscal deficit to a target of 3% of the GDP and to eliminate the revenue deficit entirely.

• It requires the government to lay three specific policy statements before Parliament: the Medium-term Fiscal Policy Statement, the Fiscal Policy Strategy Statement, and the Macro-economic Framework Statement.

• The act also aims to provide the Reserve Bank of India (RBI) with greater autonomy in managing inflation by prohibiting the government from borrowing directly from the RBI.

Additional Information

• Fiscal Deficit Components:

• Fiscal Deficit is the difference between total expenditure and non-debt receipts, representing the total borrowing needs of the government.

• Revenue Deficit refers to the excess of revenue expenditure over revenue receipts, signifying that the government is borrowing to fund daily consumption.

• N.K. Singh Committee (2016):

• This committee was formed to review the FRBM Act and recommended a debt-to-GDP ratio of 60% (40% for the Centre and 20% for States) by the year 2023.

• It introduced the Escape Clause, allowing the government to deviate from the fiscal deficit target by up to 0.5% in cases of national security, structural reforms, or major calamities.

Q49. Answer: (b) Objectives Resolution

The correct answer is Objectives Resolution.

Key Points

• The Preamble of the Indian Constitution is based on the Objectives Resolution, which was drafted and moved in the Constituent Assembly by Pandit Jawaharlal Nehru on December 13, 1946.

• The resolution outlined the fundamental commitments of the Constituent Assembly to create an independent, sovereign, and democratic India.

• It served as a guiding roadmap for the framing of the Constitution, emphasizing values such as social, economic, and political justice, equality of status and opportunity, and freedom of thought, expression, belief, faith, and worship.

• The Constituent Assembly officially and unanimously adopted the Objectives Resolution on January 22, 1947.

• The core philosophy and idealistic essence of this resolution were ultimately distilled into the Preamble, which serves as the Identity Card of the Constitution.

Additional Information

• Fundamental Rights Resolution:

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• Historically associated with the Karachi Session of the Indian National Congress in 1931, which was presided over by Sardar Vallabhbhai Patel and emphasized civil liberties and economic programs.

• Directive Principles Resolution:

• The Directive Principles of State Policy (DPSP) are contained in Part IV (Articles 36−51). These were borrowed from the Irish Constitution and aim to establish a welfare state.

• Fundamental Duties Resolution:

• These were not part of the original document but were added to Part IV-A (Article 51A) by the 42nd Constitutional Amendment Act, 1976, following the recommendations of the Swaran Singh Committee.

• The Preamble has been amended only once till date, in 1976, to include the words Socialist, Secular, and Integrity.

Q50. Answer: (d) 1909

The correct answer is 1909.

Key Points

• The Indian Council Act of 1909 is popularly known as the Morley-Minto Reforms, named after the then Secretary of State for India, Lord Morley, and the Viceroy of India, Lord Minto.

• The most landmark and controversial provision of this Act was the introduction of separate electorates for Muslims, which allowed Muslim representatives to be elected only by Muslim voters.

• By granting communal representation, the Act effectively institutionalized the divide and rule policy, which later significantly influenced the socio-political fabric of India.

• Due to the introduction of this communal voting system, Lord Minto became known in historical texts as the Father of Communal Electorate.

• The Act increased the size of the Legislative Councils at both the Central and Provincial levels; for instance, the number of members in the Central Legislative Council was raised from 16 to 60.

• It also marked the first time an Indian was appointed to the Viceroy's Executive Council, with Satyendra Prasad Sinha joining as a Law Member.

Additional Information

• Indian Council Act of 1861:

• Introduced the Portfolio System, where individual members of the executive council were placed in charge of specific departments.

• Started the process of decentralization by restoring legislative powers to the Madras and Bombay presidencies.

• Authorized the Viceroy to issue ordinances in times of emergency, which would have the force of law for six months.

• Indian Council Act of 1862 (Implementation context):

• Under the provisions of the 1861 Act, Lord Canning nominated three Indians—the Raja of Benares, the Maharaja of Patiala, and Sir Dinkar Rao—to the newly constituted Legislative Council.

• 1903:

• While not associated with a specific Indian Council Act, this year is notable for the Delhi Durbar organized by Lord Curzon to celebrate the coronation of King Edward VII.

Q51. Answer: (a) AgCl and AgBr

The correct answer is AgCl and AgBr.

Key Points

• Silver Bromide (AgBr) and Silver Chloride (AgCl) are the primary light-sensitive chemicals used in black and white photography. They belong to a group of compounds known as silver halides.

• When these compounds are exposed to light, they undergo a photochemical decomposition reaction. In this process, the silver halide crystals absorb photons, causing the silver ions to be reduced to metallic silver.

• The chemical equation for the decomposition of Silver Chloride is: $2AgCl(s) + Sunlight \rightarrow 2Ag(s) + Cl_2(g)$. The white silver chloride turns greyish due to the formation of silver metal.

• The chemical equation for Silver Bromide is: $2AgBr(s) + Sunlight \rightarrow 2Ag(s) + Br_2(g)$. In this reaction, the pale yellow silver bromide decomposes into metallic silver and bromine gas.

• In the photographic process, the areas of the film exposed to more light contain more silver metal, which creates the dark parts of the negative, while unexposed areas remain clear after processing.

Additional Information

• Silver Halides:

• These are compounds formed between Silver (Ag) and Halogens (Group 17 elements like Chlorine, Bromine, and Iodine).

• AgBr is the most widely used halide in photographic emulsions because it has the optimal level of sensitivity to light.

• AgCl is often used in photographic printing paper rather than the film itself, as it is less sensitive than bromide but produces finer detail.

• Photodecomposition:

• This is a type of decomposition reaction where a single reactant breaks down into two or more products in the presence of photons (light energy).

• This reaction is endothermic in nature as it requires the absorption of energy to break chemical bonds.

• Aside from photography, photolysis plays a critical role in ozone layer formation and photosynthesis in plants.

Q52. Answer: (c) The Malabar Coast

The correct answer is The Malabar Coast.

Key Points

• The Malabar Coast constitutes the southwestern shoreline of the Indian subcontinent, primarily spanning the state of Kerala and the coastal regions of Karnataka.

• It is geographically distinguished by its extensive backwaters, locally referred to as Kayals, which are a chain of brackish lagoons and lakes linked by man-made and natural canals.

• The formation of these lagoons is a result of the depositional work of ocean currents and waves, which created barrier islands that trapped the discharge of numerous rivers flowing down from the Western Ghats.

• Vembanad Lake, situated on this coast, is the longest lake in India and serves as the largest wetland system in the country, covering an area of approximately 2,033 square kilometers.

• These backwaters are critical for the local economy, supporting inland navigation, traditional fishing, and the unique Kuttanad farming system, where cultivation happens below sea level.

• Geologically, the Malabar Coast is a submergent coast in its southern reaches but shows evidence of emergence in other parts, characterized by narrow alluvial plains and sand dunes.

Additional Information

• The Coromandel Coast

• This refers to the southeastern coastal region of India, stretching from the False Divi Point to Kanyakumari.

• Unlike the west coast, it is broader and features large deltas formed by the Kaveri, Krishna, and Godavari rivers.

• It is notably famous for receiving heavy rainfall during the North-East Monsoon or Retreating Monsoon season.

• The Northern Circars

• This is a geographical division of the Eastern Coastal Plain lying between the Mahanadi and Krishna rivers.

• It encompasses the coastal regions of Odisha and northern Andhra Pradesh, characterized by the Chilika Lake, the largest brackish water lagoon in India.

• The Andhra Coast

• Part of the Eastern Coastal Plain, it is known for its fertile alluvial soil and the presence of the Kolleru Lake, a major freshwater lake located between the Krishna and Godavari deltas.

Q53. Answer: (d) Article 76

The correct answer is Article 76.

Key Points

• Article 76 of the Indian Constitution deals with the appointment, duties, and tenure of the Attorney General of India.

• The Attorney General is appointed by the President of India and acts as the Chief Legal Advisor to the Government of India.

• To qualify for this post, a person must be qualified to be appointed as a Judge of the Supreme Court, implying they must be a citizen of India with specific judicial or legal experience.

• The Attorney General holds office during the pleasure of the President, meaning there is no fixed tenure mentioned in the Constitution.

• Under this article, the Attorney General has the right of audience in all courts in the territory of India and the right to participate in Parliamentary proceedings without the right to vote.

Additional Information

• Article 165:

• Provides for the appointment of the Advocate General for the State.

• The Advocate General is the highest legal officer at the state level, appointed by the Governor.

• Article 211:

• Imposes a restriction on discussion in the State Legislature.

• It mandates that no discussion shall take place in the Legislature of a State with respect to the conduct of any Judge of the Supreme Court or of a High Court in the discharge of his duties.

• Article 240:

• Vests the President with the power to make regulations for the peace, progress, and good government of certain Union Territories.

• This includes territories like the Andaman and Nicobar Islands, Lakshadweep, and Dadra and Nagar Haveli and Daman and Diu.

Q54. Answer: (c) Shirley Botchwey

The correct answer is Shirley Botchwey.

Key Points

• Shirley Ayorkor Botchwey is the current Commonwealth Secretary-General, having been elected to the position during the Commonwealth Heads of Government Meeting (CHOGM) held in Samoa in October 2024.

• She officially assumed office in April 2025, succeeding Baroness Patricia Scotland, and made history as the first African woman to lead the 56-nation intergovernmental organization.

• In September 2025, she presided over the 25th Commonwealth Foreign Affairs Ministers Meeting (CFAMM) in New York, which traditionally takes place on the sidelines of the United Nations General Assembly (UNGA).

• During this high-level meeting, Shirley Botchwey advocated for climate finance, youth empowerment, and the economic resilience of Small Island Developing States (SIDS), which constitute a significant portion of the Commonwealth membership.

• As the leader of the Commonwealth Secretariat, her role involves managing the administrative functions of the organization and facilitating cooperation between member states on global issues.

Additional Information

• Patricia Scotland:

• She served as the 6th Commonwealth Secretary-General from 2016 to 2025.

• A legal expert from Dominica, she was the first woman to hold the office and championed the Commonwealth Blue Charter for ocean protection.

• Ngozi Okonjo-Iweala:

• She is the Director-General of the World Trade Organization (WTO), appointed in March 2021.

• A renowned Nigerian economist, she previously served as Nigeria's Finance Minister and Foreign Minister, but has not held the position of Commonwealth Secretary-General.

• Kamalesh Sharma:

• An Indian diplomat who served as the 5th Commonwealth Secretary-General from 2008 to 2016.

• He was instrumental in the adoption of the Commonwealth Charter in 2012, which outlines the core values of the organization.

Q55. Answer: (a) Three-tier

The correct answer is Three-tier.

Key Points

• The Balwantrai Mehta Committee was appointed by the Government of India in January 1957 to examine the working of the Community Development Programme (1952) and the National Extension Service (1953).

• The committee submitted its report in November 1957 and recommended the establishment of the scheme of Democratic Decentralization, which eventually came to be known as Panchayati Raj.

• The specific recommendation was for a three-tier Panchayati Raj system consisting of the Gram Panchayat at the village level, the Panchayat Samiti at the block level, and the Zila Parishad at the district level.

• The Gram Panchayat was to be constituted with directly elected representatives, whereas the Panchayat Samiti and Zila Parishad were to be formed with indirectly elected members.

• The committee envisioned the Panchayat Samiti as the executive body and the Zila Parishad as the advisory, coordinating, and supervisory body, chaired by the District Collector.

• Following these recommendations, Rajasthan became the first state to adopt the system, inaugurated in Nagaur district on October 2, 1959, by the then Prime Minister Jawaharlal Nehru.

Additional Information

• Two-tier system:

• This was recommended by the Ashok Mehta Committee in 1978, which suggested a Zila Parishad at the district level and a Mandal Panchayat (representing a group of villages) to replace the three-tier structure.

• Four-tier system:

• The G.V.K. Rao Committee (1985) observed that the Panchayati Raj had become grass without roots due to bureaucratization and suggested a four-tier structure including State-level Council, Zila Parishad, Mandal Panchayat, and Gram Sabha.

• L.M. Singhvi Committee (1986):

• This committee recommended that Panchayati Raj institutions should be constitutionally recognized and protected to ensure

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regular elections and financial autonomy.

• 73rd Constitutional Amendment Act, 1992:

• This act gave constitutional status to the Panchayati Raj system, mandating a three-tier system for all states with a population of over 20 lakh, adding Part IX and the Eleventh Schedule to the Constitution of India.

Q56. Answer: (a) IIT Madras

The correct answer is IIT Madras.

Key Points

• Coal India Limited (CIL), a Maharatna Public Sector Undertaking, has partnered with the Indian Institute of Technology Madras (IIT Madras) to establish the Coal India Limited Centre for Sustainable Energy (CILCSE).

• The primary objective of this collaboration is to drive research and development in sustainable energy solutions, addressing the global need for cleaner energy and decarbonization.

• The center focuses on specialized domains such as Carbon Capture, Utilization, and Storage (CCUS), Green Hydrogen, and Coal Gasification to ensure energy security while minimizing environmental impact.

• This initiative is strategically aligned with the Government of India's vision of achieving Net Zero emissions by 2070 and supports the objectives of the National Green Hydrogen Mission.

• The partnership facilitates an industry-academia interface, allowing CIL to leverage the technical expertise of IIT Madras to transition from a coal-centric company to a diversified energy entity.

Additional Information

• Coal India Limited (CIL):

• It is the largest coal producer in the world and functions under the Ministry of Coal, headquartered in Kolkata, West Bengal.

• CIL is increasingly investing in solar power and renewable energy projects to transition toward a sustainable business model.

• IIT Madras:

• Located in Chennai, it has consistently maintained the top rank in the Engineering category of the National Institutional Ranking Framework (NIRF).

• The institute is renowned for its IIT Madras Research Park, which fosters innovation and start-up ecosystems in deep-tech and energy sectors.

Q57. Answer: (d) Goal 7

The correct answer is Goal 7.

Key Points

• Sustainable Development Goal 7 (SDG 7) is one of the 17 goals established by the United Nations in 2015 as part of the 2030 Agenda for Sustainable Development.

• The primary mission of Goal 7 is to ensure universal access to affordable, reliable, sustainable, and modern energy for all individuals globally by the year 2030.

• It targets a significant increase in the global share of renewable energy sources, such as solar, wind, and geothermal power, to transition away from fossil fuels.

• Another critical objective is doubling the global rate of improvement in energy efficiency, which involves optimizing energy consumption across industrial, transportation, and residential sectors.

• Access to clean energy is considered a fundamental driver for progress in other areas, including poverty reduction, food security, health, and climate mitigation.

• The goal also emphasizes international cooperation to facilitate access to clean energy research and technology, including advanced fossil-fuel technologies with lower emissions.

Additional Information

• Sustainable Development Goal 5:

• Focuses on achieving gender equality and empowering all women and girls.

• Aims to end all forms of discrimination, violence, and harmful practices like forced marriage and female genital mutilation.

• Sustainable Development Goal 9:

• Concentrates on building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation.

• It encourages scientific research and upgrades the technological capabilities of industrial sectors in all countries.

• Sustainable Development Goal 13:

• Urges taking immediate and collective action to combat climate change and its devastating environmental impacts.

• Includes targets for strengthening resilience and adaptive capacity to climate-related hazards and natural disasters.

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Q58. Answer: (d) Convex Lens

The correct answer is Convex Lens.

Key Points

• Hypermetropia, commonly referred to as long-sightedness, is a refractive defect of the eye where light rays from nearby objects do not converge soon enough and instead focus at a point behind the retina.

• This condition occurs when the axial length of the eyeball is too short or the crystalline lens lacks sufficient curvature, resulting in a focal length that is too long for the eye's physical dimensions.

• A Convex Lens is a converging lens that is thicker at the center than at the edges. It works by bending incoming light rays inward before they reach the eye's natural lens.

• By adding a convex lens, the overall optical power of the eye is increased. This additional convergence ensures that the focal point is pulled forward and placed precisely on the retina, allowing for clear near vision.

• The power of the corrective lens required is measured in Dioptres (D) and is expressed as a positive value for Hypermetropia.

Additional Information

• Concave Lens:

• This is a diverging lens used to correct Myopia (short-sightedness).

• In a myopic eye, light focuses in front of the retina because the eyeball is too long or the lens is too curved; the concave lens spreads the rays out to shift the focus back onto the retina.

• Cylindrical Lens:

• These lenses have different powers in different meridians and are primarily used to correct Astigmatism.

• Astigmatism is caused by an irregular, non-spherical curvature of the cornea or lens, leading to distorted images.

• Photochromic Lenses:

• These are specialized lenses that darken when exposed to Ultraviolet (UV) radiation and clear up in the absence of UV light.

• They typically contain silver halide molecules and are used for light sensitivity and sun protection rather than specific refractive correction.

Q59. Answer: (c) Article 235

The correct answer is Article 235.

Key Points

• Article 235 of the Indian Constitution explicitly grants the High Court the power of control over subordinate courts within its territorial jurisdiction.

• This provision is located in Part VI, Chapter VI of the Constitution, which specifically addresses the structure and administration of Subordinate Courts.

• The scope of 'control' vested in the High Court includes administrative matters such as the posting, promotion, and the grant of leave to individuals belonging to the judicial service of a State.

• It applies to all judicial officers holding posts inferior to the rank of District Judge, ensuring that their career progression and disciplinary matters are handled by the judiciary rather than the Executive.

• The Supreme Court of India has historically interpreted this article to include disciplinary control, which allows the High Court to conduct inquiries and recommend transfers or removals to protect judicial independence.

Additional Information

• Article 308:

• It is the opening article of Part XIV, which deals with Services under the Union and the States.

• It provides the interpretation of the term 'State' specifically for the provisions contained within this part of the Constitution.

• Article 115:

• It pertains to Financial Matters of the Union Government within Part V.

• It details the procedure for Supplementary, additional or excess grants when the funds authorized for a service are found insufficient or a need arises for a new service.

• Article 107:

• It outlines the provisions as to introduction and passing of Bills in the Parliament.

• It establishes that a Bill (excluding Money Bills) may originate in either the Lok Sabha or the Rajya Sabha and must be agreed upon by both Houses to proceed.

• Article 233:

• This related article deals with the appointment of District Judges by the Governor of the State in consultation with the High Court.

Q60. Answer: (a) Correcting balance of payment imbalances and controlling inflationary pressures

The correct answer is Correcting balance of payment imbalances and controlling inflationary pressures.

Key Points

• The New Economic Policy (NEP) launched in July 1991 by the Indian government was a response to a severe economic crisis characterized by a massive Balance of Payments (BoP) deficit and skyrocketing inflation.

• The policy framework was broadly divided into two sets of measures: Stabilisation Measures and Structural Reform Measures.

• Stabilisation Measures were short-term in nature and were intended to correct the immediate weaknesses of the economy, specifically by restoring macro-economic stability.

• The first immediate objective was to improve the foreign exchange reserves to ensure India could meet its international payment obligations and avoid a sovereign default.

• The second objective was to control the inflationary pressures by regulating the money supply and fiscal deficit, as the inflation rate had reached double digits (approximately 17%) by 1991.

• These measures were a prerequisite for receiving financial assistance from international agencies like the International Monetary Fund (IMF) and the World Bank.

Additional Information

• Structural Reform Measures

• These were long-term policies aimed at improving the efficiency of the economy and increasing its international competitiveness.

• They included the famous LPG model: Liberalisation, Privatisation, and Globalisation.

• Disinvestment: This involves the government selling its equity in Public Sector Enterprises (PSEs) to private investors to reduce state control and improve corporate governance.

• Foreign Direct Investment (FDI): Policy changes were made to allow greater automatic approval for foreign capital to improve technological standards and capital availability.

• Trade Policy Reforms: These involved the removal of licensing for imports and the reduction of high tariff rates to integrate the Indian economy with the global market.

Q61. Answer: (c) Amaravati Quantum Valley

The correct answer is Amaravati Quantum Valley.

Key Points

• The Amaravati Quantum Valley was officially announced in April 2025 as a specialized economic and technological zone in Andhra Pradesh, designed to serve as India’s first major quantum computing hub.

• This project is part of a broader state initiative to transform the Amaravati capital region into a global center for deep-tech research, bridging the gap between academic theory and commercial quantum applications.

• The valley focuses on the development of quantum hardware, including superconducting qubits and photonic circuits, aiming to build intermediate-scale quantum computers with 50 to 100 physical qubits.

• It establishes a collaborative ecosystem involving Tier-1 research institutions, global technology giants, and specialized startups to drive innovation in Quantum Information Science and Technology (QIST).

• The announcement marks a significant milestone in India’s domestic capabilities, reducing reliance on foreign quantum infrastructure and aligning with the Make in India vision for frontier technologies.

Additional Information

• National Quantum Mission (NQM):

• Approved by the Union Cabinet in 2023 with an outlay of over 6,000 crore, the mission aims to seed, nurture, and scale up scientific and industrial R&D in quantum technology.

• It targets the development of quantum communication networks over a distance of 2,000 km and the creation of highly sensitive quantum sensors for navigation and healthcare.

• Core Domains of Quantum Technology:

• Quantum Computing: Utilizing superposition and entanglement to solve complex problems in optimization and drug discovery that are unsolvable by classical supercomputers.

• Quantum Cryptography: Implementing Quantum Key Distribution (QKD) to provide unhackable communication channels for national security and banking sectors.

• Quantum Materials: Engineering novel materials with topological properties for the next generation of electronic devices.

Q62. Answer: (b) 15 lakh saplings in the state

The correct answer is 15 lakh saplings in the state.

Key Points

• Seva Parv 2025, also widely celebrated as Seva Pakhwada (Service Fortnight), was observed from September 17, 2025,

marking the birthday of Prime Minister Narendra Modi, until October 2, 2025, the birth anniversary of Mahatma Gandhi.

• As part of the nationwide Sustainable Development Goal (SDG) linked drive, the Government of Uttar Pradesh established a specific target to plant 15 lakh saplings across the state during this 15-day window.

• This initiative was closely integrated with the Ek Ped Maa Ke Naam (A Tree in Mother's Name) campaign, which aims to enhance Indias carbon sink and promote climate resilience in alignment with SDG 13 (Climate Action).

• The plantation drive targeted various locations, including Panchayat lands, educational institutions, and urban forest zones, to ensure a balanced increase in the green cover of the state.

• The Department of Forest and the Department of Rural Development were the primary agencies responsible for executing this massive plantation exercise to meet the 15 lakh milestone within the stipulated timeframe.

Additional Information

• Seva Parv / Seva Pakhwada:

• It is an annual event focused on public service, social welfare, and environmental conservation activities.

• Key activities include blood donation camps, cleanliness drives under Swachh Bharat Abhiyan, and awareness programs on vocal for local.

• Environmental Targets of Uttar Pradesh:

• Uttar Pradesh has consistently set high benchmarks for afforestation, often targeting over 35 crore saplings during the monsoon season (Van Mahotsav).

• The 15 lakh target for the Seva Parv serves as a supplementary micro-campaign to sustain momentum for the state's Green Mission.

• The state utilizes the Geographic Information System (GIS) and e-Nagarpalika portals to monitor the survival rate of the planted saplings.

Q63. Answer: (d) Automation

The correct answer is Automation.

Key Points

• Automation refers to the ability of a computer to perform a series of operations or tasks without human intervention once the initial program or instructions are provided and executed.

• The Control Unit (CU) within the Central Processing Unit (CPU) facilitates this by managing the Fetch-Decode-Execute cycle, allowing the computer to move from one instruction to the next in the Instruction Set automatically.

• This characteristic is essential for complex computations and high-speed data processing, where a machine can run batch jobs, system updates, or background processes independently until a logical end-point is reached.

• In modern computing, automation enables Artificial Intelligence (AI) and Robotic Process Automation (RPA) to handle sophisticated workflows, significantly increasing operational efficiency and reducing the likelihood of human error.

Additional Information

• Diligence:

• This represents the reliability and consistency of a computer system.

• Unlike humans, computers do not suffer from fatigue, boredom, or lack of concentration, allowing them to perform millions of calculations per second for extended periods.

• Accuracy:

• Computers deliver extremely high precision in their results, often calculating up to several decimal places without error.

• The degree of accuracy is governed by the GIGO (Garbage In, Garbage Out) principle, meaning the computer is only as accurate as the input data and software logic provided to it.

• Portability:

• This refers to the ability of hardware or software to be transferred from one location or platform to another with minimal modification.

• In the context of programming languages, it signifies the ability of code to run across various operating systems such as Linux, Windows, and macOS.

Q64. Answer: (c) Ctrl + S

The correct answer is Ctrl + S.

Key Points

• The Ctrl + S shortcut is the universal command used in the Windows operating system and most productivity applications (such as Microsoft Word, Excel, and Notepad) to trigger the Save function.

• When a user types or edits a document, the data is stored in the Random Access Memory (RAM), which is volatile memory; this means any unsaved data will be permanently wiped if the computer loses power or the Operating System crashes.

• Pressing Ctrl + S initiates a command to write the data from the volatile RAM to a non-volatile storage device, such as a Hard

Disk Drive (HDD) or Solid State Drive (SSD), ensuring data persistence.

• Regularly using this shortcut is considered a critical computing best practice to minimize the risk of losing significant progress due to hardware failures or software glitches.

• As per the provided choices, Option (3) correctly identifies Ctrl + S as the essential tool for maintaining document safety. Hence, Ctrl + S is the correct answer.

Additional Information

• Ctrl + V:

• Function: This is the Paste shortcut.

• Usage: It takes the content currently stored in the system Clipboard and inserts it into the document at the location of the insertion point.

• Ctrl + C:

• Function: This is the Copy shortcut.

• Usage: It duplicates selected text or objects and stores them in the Clipboard while leaving the original content intact.

• Ctrl + X:

• Function: This is the Cut shortcut.

• Usage: It removes the selected text or object from its original location and moves it to the Clipboard for later pasting.

• F12 Key:

• Function: In many Office applications, this serves as the Save As shortcut.

• Usage: It allows the user to save an existing file with a new name, a different file extension (like PDF or TXT), or in a different directory.

Q65. Answer: (a) Marathi

The correct answer is Marathi.

Key Points

• On October 3, 2024, the Union Cabinet, chaired by Prime Minister Narendra Modi, officially approved the conferment of Classical Language status to Marathi along with four other languages.

• The recognition was part of a historic decision to elevate Marathi, Pali, Prakrit, Assamese, and Bengali to the status of Classical Languages, acknowledging their deep historical roots and literary significance.

• The Government of India follows specific criteria for this designation, including high antiquity of early texts or recorded history spanning 1500 to 2000 years and a body of ancient literature that is considered a valuable heritage by generations of speakers.

• The proposal for Marathi was long-standing, backed by extensive research demonstrating that its linguistic and literary traditions are original and not borrowed from another speech community.

• With this inclusion, Marathi joins an elite group of Indian languages that receive special support for research, preservation, and promotion from the Ministry of Education.

Additional Information

• Evolution of Classical Languages in India:

• Tamil was the first language to be accorded the status in 2004.

• Sanskrit was recognized in 2005, followed by Telugu and Kannada in 2008.

• Malayalam was designated in 2013, and Odia received the status in 2014.

• As of October 2024, the total number of recognized Classical Languages in India has reached 11.

• Benefits of the Status:

• The Ministry of Education provides two major annual International Awards for scholars of eminence in these languages.

• A Centre of Excellence for Studies in Classical Languages is established to promote academic research and documentation.

• The University Grants Commission (UGC) is requested to create a certain number of Professional Chairs for Classical Languages in Central Universities.

• Incorrect Options Context:

• Kannada: Conferred classical status in 2008.

• Tamil: Conferred classical status in 2004.

• Odia: Conferred classical status in 2014.

Q66. Answer: (a) Brussels

The correct answer is Brussels.

Key Points

• On March 6, 2025, the leaders of the European Union (EU) convened an extraordinary summit in Brussels to deliberate on the

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critical security challenges posed by the situation in Ukraine and the broader European security framework.

• Brussels serves as the administrative heart and the permanent seat of the European Council, where the heads of state or government of the 27 EU member states meet to define the Union's political direction and security priorities.

• The summit specifically focused on the European Peace Facility (EPF), the scaling up of the European defense industry, and the provision of long-term security guarantees to support Ukraine against external aggression.

• Holding the summit in Brussels allowed for immediate coordination with NATO leadership, as both organizations are headquartered in the city, emphasizing transatlantic unity and a collective response to security threats.

• Meetings typically take place at the Europa building, which is equipped with high-security facilities designed for crisis management and sensitive diplomatic negotiations between EU leaders and the President of the European Council.

Additional Information

• Vienna:

• While Vienna is a prominent international diplomatic hub hosting the OSCE (Organization for Security and Co-operation in Europe) and the IAEA, it is not the official venue for European Council summits.

• Paris:

• Paris and nearby Versailles have hosted informal EU summits in the past, particularly in early 2022, but standard extraordinary sessions concerning security policy are generally centralized in Brussels.

• Berlin:

• As the capital of the EU's largest economy, Berlin is central to European diplomacy and Weimar Triangle talks, but formal plenary sessions of the 27 member states are hosted at the EU's institutional headquarters.

Q67. Answer: (c) Computers became smaller and faster

The correct answer is Computers became smaller and faster.

Key Points

• The transition from Vacuum Tubes in the first generation to Transistors in the second generation initiated a significant reduction in physical footprint and heat generation.

• The development of Integrated Circuits (ICs) during the third generation allowed for thousands of components to be placed on a single silicon chip, drastically increasing processing speed and reliability.

• Advancements in Microprocessor technology, specifically Very Large Scale Integration (VLSI), enabled the compression of an entire Central Processing Unit (CPU) onto a single chip, leading to the miniaturization seen in modern laptops and smartphones.

• As the physical distance between electronic components decreased, the time required for electrical signals to travel was reduced, resulting in higher clock speeds and the ability to perform billions of instructions per second (BIPS).

• Successive generations have consistently improved energy efficiency and memory density, allowing computers to store more data and operate faster while consuming less power than their predecessors.

Additional Information

• Computer Generations Breakdown:

• First Generation (1940-1956): Utilized Vacuum Tubes; these machines like ENIAC and UNIVAC were room-sized and frequently overheated.

• Second Generation (1956-1963): Replaced tubes with Transistors, making computers smaller, faster, cheaper, and more energy-efficient.

• Third Generation (1964-1971): Introduced Integrated Circuits (ICs), which increased speed and efficiency by mounting many transistors on Silicon Chips.

• Fourth Generation (1971-Present): Characterized by Microprocessors and VLSI technology; this era saw the birth of Personal Computers (PCs) like the Altair 8800 and Apple II.

• Fifth Generation (Present and Beyond): Focuses on Artificial Intelligence (AI), Ultra Large Scale Integration (ULSI), and Parallel Processing to achieve human-like computing capabilities.

Q68. Answer: (b) Adichanallur, Korkai, Alangulam

The correct answer is Adichanallur, Korkai, Alangulam.

Key Points

• Adichanallur, located in the Thoothukudi district of Tamil Nadu, is an Iron Age burial site where carbon dating of paddy husks and urns has pushed the timeline of Tamil civilization back to at least 905 BCE, aligning with the early roots of the Sangam era.

• Korkai served as the ancient capital and primary port of the Early Pandyas; it is extensively mentioned in Sangam literature like Purananuru and Akananuru for its flourishing pearl fishery, which has been validated by archaeological finds of pearl oysters and brick structures.

• Alangulam, situated near the Vaigai river mouth in Ramanathapuram, was an important coastal trading center where excavations revealed Roman pottery (Arretine and Rouletted ware), confirming the international maritime trade descriptions found in Sangam

texts.

• Together with Keeladi, these sites provide material proof of high literacy (Tamil-Brahmi script), urbanization, and an advanced agrarian society that was previously known only through literary traditions.

Additional Information

• Indus Valley Civilization Sites

• Lothal, Dholavira, and Harappa belong to the Bronze Age (c. 2500–1900 BCE) and are located in the northwestern parts of the Indian subcontinent, far preceding the Sangam period.

• Medieval and Rock-cut Sites

• Ajanta and Ellora are world-famous for their monastic complexes and mural paintings in Maharashtra, largely dating from the 2nd century BCE to the 10th century CE.

• Hampi was the 14th-century capital of the Vijayanagara Empire in Karnataka, representing a much later historical epoch than the classical Sangam age.

• North-Western Sites

• Mohenjo-Daro and Kalibangan are core Harappan sites characterized by planned drainage and citadels, unrelated to the specific regional Tamil Sangam context.

Q69. Answer: (c) Kerala

The correct answer is Kerala.

Key Points

• According to the 15th official census conducted by the Registrar General and Census Commissioner of India in 2011, Kerala secured the top position with an overall literacy rate of 94.00%.

• The state demonstrated significant progress in gender-based literacy, recording a male literacy rate of 96.11% and a female literacy rate of 92.07%, which was the highest in the country.

• The success of Kerala is largely attributed to historical social reform movements, the proactive role of the Kerala State Literacy Mission, and consistent government focus on universal primary education.

• In comparison, the national average literacy rate in India during the 2011 Census was documented at 74.04%, highlighting Kerala's substantial lead over other Indian states.

• Literacy in the census is defined as the ability of a person aged 7 years and above to both read and write with understanding in any language.

Additional Information

• Literacy Data of Other Mentioned States (2011):

• Maharashtra: Recorded a literacy rate of 82.34%, maintaining its position as one of the leading industrialized states with robust educational infrastructure.

• Himachal Pradesh: Registered a literacy rate of 82.80%, reflecting successful implementation of educational policies in a difficult Himalayan terrain.

• Tamil Nadu: Stood at 80.09%, supported by various welfare schemes focused on increasing school enrollment and reducing dropout rates.

• Other Notable Rankings:

• Lakshadweep: Held the highest literacy rate among Union Territories at 91.85%.

• Mizoram: Ranked second among states with a literacy rate of 91.33%, following Kerala closely.

• Bihar: Recorded the lowest literacy rate in India at 61.80% during the 2011 period.

Q70. Answer: (c) 10^3 kg

The correct answer is 10^3 kg.

Key Points

• A tonne (also known as a metric ton) is a non-SI unit of mass that is officially accepted for use with the International System of Units (SI).

• The standard SI unit of mass is the kilogram (kg).

• One tonne is defined as exactly 1,000 kilograms, which is represented in scientific notation as 10^3 kg.

Additional Information

• SI Base Unit of Mass:

• The kilogram is one of the seven base units of the SI system.

• In 2019, the definition of the kilogram was redefined to be based on the fundamental physical constant known as the Planck constant (h), which has a fixed numerical value of 6.62607015 × 10^(−34) kg m² s^(−1).

• Other Metric Mass Conversions:

• Gram (g): One gram is 10^(−3) kg. Consequently, one tonne is equivalent to 1,000,000 grams (10^6 g).

• Quintal: A metric unit of mass equal to 100 kg (or 10^2 kg). Therefore, one tonne contains exactly ten quintals.

• Megagram (Mg): This is the official SI multi-unit for one million grams, which is mathematically identical to one tonne (1 Mg = 10^3 kg).

Q71. Answer: (c) Sister

Preparing the family tree diagram by using the following symbols:

As per the given information:

Let us first decode the given symbols and then draw a family tree.

Symbol	**≠**	**•**	**;**	**•**
Meaning	Sister	Father	Son	Wife

Given: 'F ≠ G ; H + M * O'

Based on the family tree, H and M are a married couple with three children: F, G, and O. Since F is female and they all share the same parents, F is the sister of O.

Hence, the correct answer is "Option 3"

Q72. Answer: (a) HSIC

The logic followed in this pattern is a series of alphabetical shifts where each letter is moved forward by a specific number of positions.

For 'LEMO' related to 'RJST':

L(12)	**E(5)**	**M(13)**	**O(15)**
+6 ↓	+5 ↓	+6 ↓	+5 ↓
R(18)	J(10)	S(19)	T(20)

For 'JYKI' related to 'PDQN':

J(10)	**Y(25)**	**K(11)**	**I(9)**
+6 ↓	+5 ↓	+6 ↓	+5 ↓
P(16)	D(4)	Q(17)	N(14)

Applying the same logic to 'BNCX':

B(2)	**N(14)**	**C(3)**	**X(24)**
+6 ↓	+5 ↓	+6 ↓	+5 ↓
H(8)	S(19)	I(9)	C(3)

Thus, BNCX is related to HSIC following the pattern +6, +5, +6, +5.

Hence, the correct answer is 'Option 1'.

Q73. Answer: (d) HMK

The logic follows here,

Logic: 1st letter + 4 = 2nd letter; 2nd letter − 1 = 3rd letter.

For XBA,

For ZDC,

For DHG,

For HMK,

This letter cluster does not follow the rule.

Therefore, the letter cluster that is different from the others is HMK.

Hence, the correct answer is 'Option 4'.

Q74. Answer: (d) BGD

The logic follows here,

Logic: Second letter = First letter + 4; Third letter = Second letter − 2.

For ZDB,

For VZX,
For YCA,
For BGD,
Therefore, the letter cluster that is different from the others is BGD.
Hence, the correct answer is 'Option 4'.

Q75. Answer: (c) 2

Given: Y O W G U R C X Z H M E S I K A Q D F T B
Required Condition: Consonant - Consonant − Vowel
(Left) Y O W G U R C X Z H M E S I K A Q D F T B (Right)
W G U, H M E
Hence, the correct answer is "Option 3"

Q76. Answer: (d) 18 km to the East

Given:
• Mr. Yorly starts from Point A and drives 4 km towards South. He then takes a left turn, drives 23 km, turns left and drives 8 km.
• He then takes a left turn and drives 41 km.
• He takes a final left turn, drives 4 km and stops at Point P
The Final Diagram,
18 km to the East.
Hence, the correct answer is " Option 4"

Q77. Answer: (b) rn

The logic followed here is
Compare the first and second sentences.

Thus, the code for food is rn.
Hence, the correct answer is "Option 2"

Q78. Answer: (c) Neither conclusion (I) nor (II) follows

The least possible Venn diagram for the given statements is:
Conclusion
(I) Some apples are sweet - Doesn't follow
(There is no direct relation between apples and sweets; maybe it is possible but not definite. Hence, it is false.)
(II) All fruits are apples - Doesn't follow
(All apples are fruit and all fruits are apples may be possible but not definite. Hence, it is false)
Neither conclusion (I) nor (II) follows
Hence, the correct answer is "Option 3"

Q79. Answer: (d) 48

BODMAS Table:
Given equation: 1 ÷ 1 × 1 + 2 − 49 = ?
Sign Interchange Mapping:

Original Sign	÷	×	•	−
Interchanged Sign	×	÷	−	•

Applying the interchanges to the expression and applying BODMAS rule:
= 1 × 1 ÷ 1 − 2 + 49
= 1 × 1 − 2 + 49
= 1 + 49 − 2
= 50 − 2
= 48
Hence, the correct answer is "option 4"

Q80. Answer: (a) 260

The logic follows here,

• 232 + 28 = 260

• 260 − 56 = 204

• 204 + 84 = 288

• 288 − 112 = 176

• 176 + 140 = 316

By following this pattern, the missing number in the series is 260.

Hence, the correct answer is "option 1"

Q81. Answer: (d) PUN

The logic followed here is,

The next term in the series is PUN.

Hence, the correct answer is "Option 4"

Q82. Answer: (a) 5

The given word is PROVIDE.

Step 1: Arrange the letters of the word PROVIDE in English alphabetical order.

Original Word	P	R	O	V	I	D	E
Alphabetical Order	D	E	I	O	P	R	V

New Word : Left D E I O P R V Right

• Third letter from the left = I

• Fourth letter from the right = O

• New cluster: D, E, I, O, P, R, V

• Third letter from the left: I

• Fourth letter from the right: O

• Letters between I and O are: J, K, L, M, N.

• Therefore, there are 5 letters between them.

Hence, the correct answer is "option 1"

Q83. Answer: (b) 1

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. A is kept second from the bottom.

2. Only three boxes are kept between A and G.

3. F is kept at one of the positions below A.

Position	Box
7	
6	G
5	
4	
3	
2	A
1	F

1. Only E is kept between G and D.

2. C is kept at one of the positions above G

3. B is the only remaining box and will occupy position 3.

Final Arrangement:

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

There is only 1 box (B) kept between A and D.

Hence, the correct answer is "Option 1"

Q84. Answer: (a) Three

Given: R, E, A, D, I, N and G are sitting around a circular table, facing the centre of the table.

1. D sits third to the right of N
2. D sits to the immediate right of R
3. R sits third to the left of I.
4. A is not an immediate neighbor of R.
5. Only one person sits between G and E when counted from the left of E

The Final Arrangement is,

There are three person in between A and E when counted from the right of A

Hence, the correct answer is 'Option 1'.

Q85. Answer: (c) BEG

The logic followed here is,

For PSV,

For NQT,

For BEG,

For DGJ,

Therefore, the letter cluster that is different from the others is BEG.

Hence, the correct answer is 'Option 3'.

Q86. Answer: (c) Four

Given:Seven boxes, I, J, K, L, Q, R and S, are kept one over the other, but not necessarily in the same order.

1. K is kept third from the bottom.
2. Only one box is kept above R.
3. Only one box is kept between R and Q.

Position	Box
7	
6	R
5	
4	Q
3	K
2	
1	

1. J is kept immediately above L.
2. I is kept at some place below S.

Final Arrangement:

7	S

6	R
5	I
4	Q
3	K
2	J
1	L

Thus, there are four boxes R, I, Q, and K kept between S and J.

Hence, the correct answer is 'Option 3'.

Q87. Answer: (d) TVS

The logic followed here is,

The next term in the series is TVS.

Hence, the correct answer is " Option 4"

Q88. Answer: (c) 13

BODMAS Table:

Sign Interchange:

Original Sign	New Sign
•	×
×	•
−	÷
÷	−

Given Equation: 8 + 3 ÷ 116 − 4 × 18

After interchanging the signs, and following BODMAS rule,

= 8 × 3 − 116 ÷ 4 + 18

Step-by-step solution:

= 8 × 3 − 29 + 18

= 24 + 18 − 29

= 42 − 29

= 13

Hence, the correct answer is "option 3"

Q89. Answer: (b) HLE

The logic followed here is

The next term in the series is HLE.

Hence, the correct answer is "option 2".

Q90. Answer: (b) (182, 164, 352)

The logic followed here is:

Logic: (First Number + Second Number) + 6 = Third Number

For the first set (156, 204, 366)

=> (156 + 204) + 6

=> 360 + 6 = 366.

For the second set (150, 162, 318)

=> (150 + 162) + 6

=> 312 + 6 = 318.

Applying the same logic to Option 2

(182, 164, 352)

=> (182 + 164) + 6

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=> 346 + 6 = 352.

Hence, the correct answer is 'Option 2'.

Q91. Answer: (c) 49

The logic followed here is,

BODMAS Table:

According to the question, the signs are substituted as follows:

Alphabet	Sign
P	÷
R	×
S	•
Q	−

Given expression:109 S 256 P 8 Q 2 R 17 Q 58 = ?

After replacing and apply the BODMAS rule:

= 109 + 256 ÷ 8 - 2 × 17 − 58

= 109 + 32 - 2 × 17 − 58

= 109 + 32 - 34 − 58

= 141- 92

= 49

Hence, the correct answer is " Option 3"

Q92. Answer: (b) Neither conclusion (I) nor (II) follows

The least possible Venn diagram is:

(I) Some foods are tables - Doesn't follow

There is no direct relation between foods and tables; maybe it is possible but not definite. Hence, it is false.

(II) All rains are tables - Doesn't follow

(All tables are rains but all rains is table is not tables.)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 2"

Q93. Answer: (d) og

The logic followed here is,

Comparison of the two statements:

Therefore, the code for 'apple' is 'og'.

Hence, the correct answer is "option 4"

Q94. Answer: (d) 151

The logic followed here is:

• 7 + 9 = 16

• 16 + 13 = 29

• 29 + 22 = 51

• 51 + 26 = 77

• 77 + 35 = 112

• 112 + 39 = 151

Thus, the missing term in the series is 151.

Hence, the correct answer is 'Option 4';

Q95. Answer: (a) Two

The logic followed here is,

Given: (Left) L U H T R B F G A O D Q S I X M C K W (Right)

• Seventh from the left end is F.

• Sixth from the right end is I.

The letters between F and I are G and H.

There are 2 letters between them.

Hence, the correct answer is "option 1"

Q96. Answer: (b) Mother's brother's son

Preparing the family tree diagram by using the following symbols:

As per the given information:

Let us first decode the given symbols and then draw a family tree.

Symbol	÷	#	•	&
Meaning	Son	Wife	Brother	Father

Given: S ÷ D + R # Y & H

Therefore, S is the Mother's brother's son of H.

Hence, the correct answer is "Option 2 ".

Q97. Answer: (b) I

Given: R, E, A, D, I, N and G are sitting around a circular table, facing the centre of the table.

1. Only three people sit between G and A when counted from the left of G.
2. Only three people sit between N and E when counted from the right of E.
3. R sits to the immediate right of N.
4. I is an immediate neighbor of E as well as A.

The Final Arrangement is,

Therefore, I sits second to the left of D.

Hence, the correct answer is 'Option 2'.

Q98. Answer: (d) Two

Given:Seven boxes, I, J, K, L, Q, R and S, are kept one over the other, but not necessarily in the same order.

1. Only K is kept above R.
2. Only S is kept between R and I.

Position	Box
7	K
6	R
5	S
4	I
3	
2	
1	

1. Only J is kept below L.
2. The only remaining position is occupied by Q.

Final Arrangement:

7	K
6	R
5	S
4	I
3	Q
2	L
1	J

Thus, there are two boxes kept between Q and R.
Hence, the correct answer is 'Option 4'.

Q99. Answer: (c) FEAR-EAFR-AFER

The Logic follows here,
OURS –UROS –ROUS,
SAME –AMSE –MSAE,
Applying for the same logic,
FEAR-EAFR-AFER
Hence, the correct answer is "Option 3"

Q100. Answer: (a) QL - SN - TV

The logic follows here,
For KF − MH − NP,
For MH - OJ - PR,
Applying for the same logic QL − SN − TV,
Therefore, the triad QL − SN − TV follows the same pattern.
Hence, the correct answer is "option 1"

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