RRB NTPC (UG) CBT-I Official Paper (Held On 19 Jun, 2026 Shift 1) (Previous Year Paper)

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

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MATHEMATICS

Q1. The present age of a father is equal to sum of ages of his son and daughter. Ten years ago from now, the age of the father was double the age of the son and four times the age of the daughter. The total present age of the father, daughter and son is ____ years.

(a) 120
(b) 80
(c) 100
(d) 60

Q2. Two positive numbers are in the ratio 2:3. If the product of their LCM and HCF is 294, then find the sum of the two numbers.

(a) 15
(b) 35
(c) 30
(d) 20

Q3. Two trains, 130 meters and 120 meters long, are running in parallel tracks in the same direction at speeds of 62 km/hr and 44 km/hr, respectively. How much time will the faster train take to completely cross the slower one?

(a) 55 seconds
(b) 50 seconds
(c) 45 seconds
(d) 60 seconds

Q4. Pipes, A and B, can fill a tank in 10 hours. Pipes, B and C, can fill the same tank in 20 hours. If pipe B alone can fill the same tank in 30 hours, how much time will the pipes A and C take together to fill the same tank.

(a) 16 hours
(b) 13 hours
(c) 12 hours
(d) 14 hours

Q5. Three numbers are in the ratio 3 : 7 : 2, and their LCM is 5376. Their HCF is:

(a) 128
(b) 161
(c) 140
(d) 162

Q6. Evaluate

$25^3 + (-7)^3 + (-18)^3$

(a) 9450
(b) 9173
(c) 9490

(d) 9350

Q7. Chetan's salary is Rs. 16000 per month. He spends Rs. 6000 on house rent, Rs. 1500 on bills and the rest of the amount is his monthly savings. Find his savings(in Rs.) in a year, if in the month of his birthday he spent his complete monthly saving for birthday celebration.

(a) 102000
(b) 76500
(c) 93500
(d) 85000

Q8. The simple interest on a certain sum for 4 years at 10% interest per annum is Rs. 3,200. What will be the amount payable after 6 years at the same rate?

(a) Rs. 12,400
(b) Rs. 12,800
(c) Rs. 11,800
(d) Rs. 11,400

Q9. Simplify:

$8^2 + \sqrt{8^2} - \sqrt{49} - 6$

(a) 50
(b) 59
(c) 66
(d) 53

Q10. Surjeet buys 20 kg of sugar for Rs. 900. He sells 18 kg of sugar for Rs. 918. What is the percentage profit made by Surjeet?

(a) 111/3%
(b) 131/3%
(c) 111/9%
(d) 131/9%

Q11. 324 × 24 = 7776.

What will 7.776 ÷ 2.4 be equal to?

(a) 3.24
(b) 0.0324
(c) 32.4
(d) 0.324

Q12. In a class, the average weight of the boys is 65 kg and the average weight of the girls is 45 kg. The average weight of the whole class is 57 kg. What is the ratio of the number of girls to the number of boys in the class?

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

Q13. A store offers a 10% festival discount on the marked price of Rs. 900. Later, to clear the stock, it offers an additional 5% off on the already discounted price. What is the total amount paid by the customer?

(a) Rs. 790
(b) Rs. 785.50
(c) Rs. 775
(d) Rs. 769.50

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Q14. The ratio of the radii of two spheres is 2 : 3. If the radius of the first sphere is increased by 50% and the radius of the second sphere is increased by 20%, find the ratio of their new volumes.

(a) 144 : 125
(b) 125 : 169
(c) 125 : 216
(d) 216 : 343

Q15. A trader buys a mobile phone for Rs. 8000, spends Rs. 500 on repairs, and sells it at a profit of 20% on the total cost. Later, the buyer resells it at a loss of 25%. What price does the final buyer pay for the mobile phone?

(a) Rs. 9600
(b) Rs. 7650
(c) Rs. 7000
(d) Rs. 10500

Q16. The numerator of a fraction is 8 less than the denominator. If the denominator is increased by 5 and the numerator is increased by 3, we get the fraction 3/4. Find the original fraction.

(a) 11/14
(b) 27/35
(c) 3/5
(d) 19/23

Q17. From the top of a 75-meter-high lighthouse, the angles of depression of two ships are 30° and 45°. If the two ships are on the same side of the lighthouse and in a straight line with its base, find the distance between the two ships. (Use √3 = 1.732)

(a) 58.4 meters
(b) 54.9 meters
(c) 61.2 meters
(d) 52.5 meters

Q18. Simplify: ((13/21))/((13/10)) ÷(5/9 × 18/15+5/7)+10/6 ÷ 29/15 of 15/6

(a) 13/36
(b) 20/29
(c) 10/27
(d) 26/37

Q19. If the average of four numbers is 15, and three of the numbers are 10, 20, and 25, what is the fourth number?

(a) 20
(b) 15
(c) 5
(d) 10

Q20. Ravi buys an article with a discount of 25% on its marked price. He makes a profit of 10% by selling it at Rs. 1,320. The marked price of the article was:

(a) Rs. 1550
(b) Rs. 1600
(c) Rs. 1400
(d) Rs. 1650

Q21. What sum (in Rs.) will earn a simple interest of Rs. 1,320 in 4 years at 8% per year rate of interest?

(a) 2,062.5
(b) 4,125
(c) 422.4
(d) 8,250

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Q22. Two friends, P and Q, started a business by investing Rs. 3,000 and Rs. 600, respectively. At the end of one year, the business earned a total profit of Rs. 54,846. What is the share (in Rs.) of P in the profit?

(a) 45,705
(b) 45,555
(c) 45,605
(d) 45,855

Q23. A pentagon is divided into three triangles by drawing diagonals from one of its vertices. The areas of two of these triangles are 24 cm^2 and 30 cm^2. The third triangle has a base of 12 cm and a height of 38 cm. What is the area (in cm^2) of the pentagon?

(a) 242
(b) 228
(c) 275
(d) 282

Q24. The price of an article is successively increased by 9% and 13%. Find the percentage increase in the price of the article.

(a) 24.69%
(b) 22.57%
(c) 23.17%
(d) 20.68%

Q25. A positive integer N divides 228, leaving a remainder of 18. What is the greatest two-digit value of N?

(a) 70
(b) 60
(c) 84
(d) 42

Q26. In triangle ABC, angle A = (3x-7)°, angle B = 2angle A and angle C = (4x+6)°. Find the value of angle A + angle C.

(a) 104°
(b) 115°
(c) 148°
(d) 135°

Q27. A faster train overtakes a slower train, both moving in the same direction. The faster train takes 36 seconds to completely pass the slower train. A passenger sitting in the faster train observes that he passes the slower train in 12 seconds. Find the ratio of the length of the faster train to the length of the slower train.

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

Q28. A and B can complete a piece of work in 12 days and 6 days, respectively. Both work together for 2 days and then A leaves. B completes the remaining work alone. In how many days is the whole work completed?

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

Q29. Rs. 5,278 is divided among X, Y, and Z in such a way that if Rs. 67, Rs. 61, and Rs. 68 are deducted from their respective shares, they have money in the ratio 8 : 20 : 5. Find X’s share after deduction.

(a) Rs. 1,082
(b) Rs. 1,132
(c) Rs. 1,332
(d) Rs. 1,232

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Q30. Find the third proportional to 8 and 48.2.

(a) 290.405
(b) 288.000
(c) 240.500
(d) 292.400

GENERAL AWARENESS

Q31. The transverse nature of light can be demonstrated using _____.

(a) Lens
(b) Prism
(c) Polaroid
(d) Mirror

Q32. Which of the following courts upheld the government's "Sahyog portal" takedown powers in September 2025?

(a) Bombay High Court
(b) Delhi High Court
(c) Karnataka High Court
(d) Calcutta High Court

Q33. When electricity is passed through an aqueous solution of sodium chloride (called brine), it decomposes to form sodium hydroxide. This process is called:

(a) Chlor-alkali process
(b) Filtration process
(c) Sublimation process
(d) Polymerisation process

Q34. What was one main demand of the Muslim League that was accepted by the British government in 1909?

(a) Partition of India
(b) Universal adult franchise
(c) Separate electorates for Muslims
(d) Complete independence

Q35. Which of the following is NOT a directive mentioned in Article 39 of the Indian Constitution?

(a) Equal pay for equal work for both men and women
(b) Protection of the strength and health of workers
(c) Prevention of exploitation of childhood and youth
(d) Promotion of international trade relations

Q36. The Atal Pension Yojana, introduced as a social security measure in the post-1991 reform period, is available for individuals in which age group?

(a) 21-50 years
(b) 18-60 years
(c) 18-40 years
(d) 21-60 years

Q37. The Gateway of India was built to commemorate the visit of:

(a) Queen Victoria
(b) George V and Queen Mary
(c) Prince Charles
(d) Queen Elizabeth II

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Q38. Which of the following folk music styles belongs to Sikkim?

(a) Lepcha
(b) Bihu songs
(c) Baul
(d) Lavani

Q39. The term ROM is an abbreviation for:

(a) Reusable Operating Machine
(b) Rapid Optical Media
(c) Random Output Module
(d) Read Only Memory

Q40. Which among the following states had the largest population of children (0–6 years) as per the Census 2011 provisional figures?

(a) Maharashtra
(b) Bihar
(c) Rajasthan
(d) Uttar Pradesh

Q41. A certain software component is critical for memory management and process scheduling, allowing multiple programs to run concurrently, and it is the first program loaded by the boot process. It generally operates in a privileged mode (kernel mode). Based on this description, which category of software does this component belong to?

(a) Application Software
(b) System Software
(c) Utility Software
(d) Driver Software

Q42. Which country topped the Henley Passport Index 2025?

(a) Japan
(b) Singapore
(c) China
(d) Germany

Q43. The female labour force participation rate (LFPR) for persons aged 15+ in October 2025 reached approximately:

(a) 30.0 %
(b) 32.0 %
(c) 38.0 %
(d) 34.2 %

Q44. As announced in December 2025, Union Coal Minister G. Kishan Reddy stated that the target of 100 million tonnes under the Coal Gasification Mission is to be achieved by which year?

(a) 2030
(b) 2034
(c) 2028
(d) 2032

Q45. Who among the following worked for widow remarriage in India?

(a) Ishwar Chandra Vidyasagar
(b) Bal Gangadhar Tilak
(c) Swami Vivekananda
(d) Jyotiba Phule

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Q46. The work ‘Panchasiddhantika’, which deals with astronomy, was written in the sixth century by:

(a) Aryabhata
(b) Brahmagupta
(c) Kalidasa
(d) Varahamihira

Q47. The bar at the bottom of the Windows screen that shows open applications is:

(a) Title bar
(b) Taskbar
(c) Menu bar
(d) Scroll bar

Q48. The Pitti Island in Lakshadweep is notable for which feature?

(a) It is uninhabited and has a bird sanctuary
(b) It contains active volcanoes
(c) It hosts India’s largest military base
(d) It is the gateway to the Andaman Sea

Q49. The split between Moderates and Extremists in the Indian National Congress took place at the 1907 session held at:

(a) Bombay
(b) Lahore
(c) Calcutta
(d) Surat

Q50. According to the Union Budget 2025-26, how many districts will be initially covered under the 'Prime Minister Dhan-Dhaanya Krishi Yojana-Developing Agri Districts Programme'?

(a) 51
(b) 75
(c) 111
(d) 100

Q51. After proclamation, Financial Emergency must be approved within how many months by Parliament?

(a) Approved by both Houses of Parliament within Six months
(b) Approved by both Houses of Parliament within Two months
(c) Approved by both Houses of Parliament within One months
(d) Approved by both Houses of Parliament within Three months

Q52. Which four objectives of the Constitution are explicitly mentioned in the Preamble of India?

(a) Rights, Duties, Laws, Governance
(b) Parliament, President, Judiciary, Election
(c) Sovereign, Republic, Secular, Monarchy
(d) Justice, Liberty, Equality, Fraternity

Q53. The General Agreement on Tariffs and Trade (GATT) was signed in which of the following years?

(a) 1947
(b) 1944
(c) 1995
(d) 1946

Q54. A plateau that is surrounded by mountains on all sides is generally referred to as a:

(a) Lava plateau
(b) Dissected plateau
(c) Piedmont plateau
(d) Intermontane plateau

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Q55. Which country's human rights practices report was criticised by Human Rights Watch for omitting categories like LGBT people, persons with disabilities, and freedom of assembly in August 2025?

(a) Russia
(b) India
(c) United States
(d) China

Q56. Which physical process creates the seasonal pressure difference between the Indian subcontinent and surrounding oceans that initiates the summer monsoon winds?

(a) Weak coriolis force
(b) Presence of the Himalayas
(c) Differential heating of land and sea
(d) Variation in rainfall pattern

Q57. What is the primary function of the Sahitya Akademi?

(a) To provide translation services
(b) To promote literature in Indian languages
(c) To conduct language proficiency tests
(d) To promote classical languages

Q58. Padmashri Elam Endira Devi is associated with which classical dance form?

(a) Manipuri
(b) Kathak
(c) Odissi
(d) Bharatanatyam

Q59. In the production of crystal sugar from sugarcane juice, the sugar is separated from the liquid through the growth of solid particles (sugar crystals) from a concentrated solution (syrup). This separation technique is called _____.

(a) Distillation
(b) Chromatography
(c) Crystallization
(d) Filtration

Q60. A country with a high birth rate and a high death rate typically reflects:

(a) Post-industrial society
(b) Advanced economy
(c) Low dependency ratio
(d) Early stage of demographic transition

Q61. Which combination of SI base units correctly represents the unit of density based on its dimensional formula?

(a) Milligram per cubic centimetre
(b) Kilogram per metre cubed
(c) Gram per litre
(d) Kilogram per litre

Q62. In collaboration with UNICEF, the Government of Telangana developed the city-level action plan "CLAP for Children" for which city?

(a) Hyderabad
(b) Nalgonda
(c) Karimnagar
(d) Ranga Reddy

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Q63. One of the winners of the Goldman Environmental Prize 2025, Semia Gharbi, belongs to which place?

(a) Tunisia
(b) Peru
(c) Mongolia
(d) Albania

Q64. Which among the following best represents the change in society from the Early to the Later Vedic period?

(a) Shift from settled villages to nomadic life
(b) Decline of agriculture and rise in hunting
(c) End of religious practices and rituals
(d) Emergence of a complex varna hierarchy

Q65. Government of India created the Rural Infrastructure Development Fund (RIDF) in NABARD in 1995-96, with an initial corpus of:

(a) Rs. 5,000 crore
(b) Rs. 2,000 crore
(c) Rs. 4,500 crore
(d) Rs. 3,000 crore

Q66. Which Amendment limited the Council of Ministers size to fifteen percent of total Lok Sabha strength?

(a) 42nd Amendment
(b) 99th Amendment
(c) 86th Amendment
(d) 91st Amendment

Q67. Which aspect most clearly contrasts user interaction with system software versus application software?

(a) System software typically has minimal direct interaction; applications are highly interactive.
(b) Both have identical interaction patterns.
(c) Application software never has a graphical interface.
(d) Users always configure system software for every action.

Q68. In which of the following ways has the private sector contributed to India's industrial growth and global expansion since the economic reforms of 1991?

(a) Restricting industrial growth to maintain a stable economy
(b) Aggressively pursuing global acquisitions and enhancing industrial growth
(c) Limiting its activities to non-core industries
(d) Relying solely on government subsidies for expansion

Q69. Which Part and Schedule of the Constitution of India deals with Municipalities?

(a) Part IXA and 11^(th) Schedule
(b) Part IX and 12^(th) Schedule
(c) Part IXA and 12^(th) Schedule
(d) Part IX and 11^(th) Schedule

Q70. According to the Census of India 2011, what was the sex ratio (number of females per 1,000 males) among the Scheduled Tribe (ST) population in India?

(a) 970
(b) 990
(c) 1,010
(d) 950

GENERAL INTELLIGENCE AND REASONING

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Q71. Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

DGD−ADA

ILI−FIF

(a) ADA−XAX
(b) ACY−XAX
(c) ADA−WAW
(d) ACY−WZW

Q72. Select the triad which follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

DF – HJ – LN

GI – KM –OQ

(a) EB – IG – NL
(b) AC – EG – IK
(c) ME – QK – XQ
(d) HI – MP – SU

Q73. If 2 is added to each odd digit and 1 is subtracted from each even digit in the number 163742, how many digits will appear more than once in the new number thus formed?

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

Q74. X is the mother of F. F is the sister of T. U is the father of K. K is the son of T. How is X related to K?

(a) Mother's sister
(b) Mother's mother
(c) Mother
(d) Sister

Q75. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

FIN KNS PSX UXC ?

(a) YSK
(b) KLM
(c) ZCH
(d) JKP

Q76. What will come in place of '?' in the following equation, if '+' and '-' are interchanged and 'x' and '÷' are interchanged?

94 ÷ 5 + 262 - 24 x 6 = ?

(a) 209
(b) 210
(c) 211
(d) 212

Q77. Refer to the following letter series and answer the question. (Counting to be done from left to right only)

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

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

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

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Q78. Seven people F, G, H, L, M, O and Q are sitting in a row facing north. Only five people sit between G and O. H sits to the immediate left of O. Only one person sits between H and F. Q sits immediately to the left of L. How many people sit between L and O?

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

Q79. All 165 people are standing in a row facing north. Rt is 134th from the right end while Kl is 18th from the left end. How many people are there between Rt and Kl?

(a) 13
(b) 12
(c) 16
(d) 14

Q80. What should come in place of ? in the given series based on the English alphabetical order?

LMO STV ZAC GHJ ?

(a) MPQ
(b) NPP
(c) NOQ
(d) NNP

Q81. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements: All ants are wings. No logs are wings.

Conclusion (I): No logs are ants.

Conclusion (II): Some wings are ants.

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

Q82. Seven people H, I, J, K, W, Y and Z are sitting in a row facing north. No one sits to the left of H. Only four people sit between H and I. Only three people sit to the right of W. Z sits to the immediate left of J. Y is not an immediate neighbor of W. How many people sit between Y and W?

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

Q83. Pqr ranked 71^(st) from the bottom and 39^(th) from the top in his class. How many students are there in his class?

(a) 108
(b) 107
(c) 109
(d) 113

Q84. 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.)

18, 200

17, 189

(a) 19, 211

(b) 22, 246
(c) 24, 264
(d) 16, 176

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) KJM
(b) FEH
(c) TTV
(d) ZYB

Q86. 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) EBY
(b) TQN
(c) BZV
(d) FCZ

Q87. 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) Father
(b) Husband
(c) Brother
(d) Son

Q88. Select the triad that follows the same pattern as that followed by the two sets of triads given below. Both triads follow the same pattern.

BATH –HBAT –THBA

TOYS –STOY -YSTO

(a) CART - ACTR - CTAR
(b) TOMB -OMTB -MTOB
(c) LOVE- OVEL -VELO
(d) ABLE-EABL-LEAB

Q89. 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 fishes are watches.

No watch is an octopus.

Conclusions:

(I) Some fishes are octopus.

(II) Some watches are fishes.

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

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Q90. What will come in place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

558 × 31 − 18 ÷ 17 + 321 = ?

(a) 3
(b) 16
(c) 33
(d) 24

Q91. In a certain code language, 'BIKE' is coded as '4821' and 'KITE' is coded as '2146'. What is the code for 'B' in the given code language?

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

Q92. What should come in place of '?' in the given series?

111 114 120 129 ? 156

(a) 144
(b) 148
(c) 141
(d) 151

Q93. What should come in place of the '?' in the given series?

15 22 40 67 105 152 ?

(a) 165
(b) 210
(c) 167
(d) 156

Q94. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) HL-NR
(b) DH-JN
(c) JO-QU
(d) FJ-LP

Q95. The position(s) of how many letters will remain unchanged if each letter in the word SERVANT is arranged in the alphabetical order?

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

Q96. Refer to the following number series and answer the question that follows. Counting to be done from left to right only. (All numbers are single-digit numbers only.)

(Left) 6 4 2 9 3 2 6 8 4 2 8 8 1 6 7 6 5 8 7 5 4 3 4 (Right)

How many such odd digits are there, each of which immediately preceded by an even digit and also immediately followed by an odd digit?

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

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Q97. In a certain code language, ‘depth salad road’ is coded as ' ok oh wc' and ‘salad shirt rat’ is coded as ‘ut cu oh’. How is ‘salad’ coded in the given language?

(a) oh
(b) ut
(c) wc
(d) ok

Q98. All 145 people are standing in a row facing north. Ccd is 24th from the right end while Vks is 26th from the left end. How many people are there between Ccd and Vks?

(a) 92
(b) 94
(c) 95
(d) 98

Q99. What should come in place of '?' in the given series based on the English alphabetical order?

COV ERX GUZ IXB ?

(a) LAC
(b) MAD
(c) LBE
(d) KAD

Q100. Mr. Vasu starts from Point A and drives 25 km towards the north. He then takes a left turn, drives 17 km, turns left and drives 9 km. He then takes a right turn, drives 5 km, turns left and drives 20 km. He then takes a left turn and drives 29 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-degree turns only unless specified.)

(a) 10 km to the east
(b) 7 km to the west
(c) 8 km to the north
(d) 9 km to the south

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) 100

Shortcut Trick

Let Father's age 10 years ago be x. Then Son's age was x/2 and Daughter's age was x/4.

Present ages: Father = (x + 10), Son = (x/2 + 10), Daughter = (x/4 + 10).

Given: Present Father = Son + Daughter => (x + 10) = (x/2 + 10) + (x/4 + 10).

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=> x + 10 = 3x/4 + 20 => x/4 = 10 => x = 40.

Present Father = 50. Since Total = Father + (Son + Daughter) and Father = Son + Daughter, Total = 2 × Father = 2 × 50 = 100.

Therefore The correct answer is 100 years.

Alternate Method

Let the present ages of the Father, Son, and Daughter be F, S, and D respectively.

Given:

1) F = S + D

2) 10 years ago: (F − 10) = 2(S − 10) and (F − 10) = 4(D − 10)

From the second condition:

=> F − 10 = 2S − 20 => 2S = F + 10 => S = (F + 10) ÷ 2

=> F − 10 = 4D − 40 => 4D = F + 30 => D = (F + 30) ÷ 4

Substitute S and D in the first equation:

=> F = [(F + 10) ÷ 2] + [(F + 30) ÷ 4]

Multiply the entire equation by 4 to clear denominators:

=> 4F = 2(F + 10) + (F + 30)

=> 4F = 2F + 20 + F + 30

=> 4F = 3F + 50

=> F = 50 years

Calculating S and D:

=> S = (50 + 10) ÷ 2 = 30 years

=> D = (50 + 30) ÷ 4 = 20 years

Total Age:

=> Total = F + S + D = 50 + 30 + 20 = 100 years.

Therefore The correct answer is 100 years.

Additional Information

Constant Age Difference

The difference between the ages of two individuals remains constant at any point in time (past, present, or future).

Time Shift in Ages

If the current age is x, then age n years ago was (x − n) and age n years hence will be (x + n).

Ratio and Units Method

When ratios at two different times are given, ensure the ratio difference between the periods is scaled to match the actual time gap.

Q2. Answer: (b) 35

Shortcut Trick

Ratio of numbers = 2 : 3

Product of ratio parts = 2 × 3 = 6 units²

Given product of LCM and HCF = 294

1 unit² = 294 ÷ 6 = 49 → 1 unit = √49 = 7

Sum of numbers = (2 + 3) × 7 = 5 × 7 = 35

Therefore The correct answer is 35.

Alternate Method

Given:

Ratio of two positive numbers = 2 : 3

Product of LCM and HCF = 294

Formula Used:

Product of two numbers = LCM × HCF

Calculations:

=> Let the two positive numbers be 2x and 3x.

=> According to the property: (2x) × (3x) = 294

=> 6x² = 294

=> x² = 294 ÷ 6

=> $x^2 = 49$

=> $x = \sqrt{49} = 7$

=> The numbers are: $2 \times 7 = 14$ and $3 \times 7 = 21$

=> Sum of the two numbers = 14 + 21 = 35

Therefore The correct answer is 35.

Additional Information

Product Property of HCF and LCM

For any two numbers a and b, the relationship is always: $a \times b = HCF(a, b) \times LCM(a, b)$.

Ratio and HCF

If two numbers are in the ratio x : y, then the numbers can be written as Hx and Hy, where H is the Highest Common Factor (HCF).

LCM of Ratio Numbers

If the numbers are Hx and Hy (with x and y being coprime), then their LCM is $H \times x \times y$.

Q3. Answer: (b) 50 seconds

Shortcut Trick

Relative speed in same direction = 62 − 44 = 18 km/hr.

Convert speed to m/s: $18 \times (5/18) = 5$ m/s.

Total distance to cross = 130 + 120 = 250 m.

Time taken = Total Distance ÷ Relative Speed = 250 ÷ 5 = 50 sec.

Therefore The correct answer is 50 sec.

Alternate Method

Given:

Length of the faster train (L1) = 130 m

Length of the slower train (L2) = 120 m

Speed of the faster train (S1) = 62 km/hr

Speed of the slower train (S2) = 44 km/hr

Formula Used:

Relative Speed (same direction) = S1 − S2

Time = Total Distance ÷ Relative Speed

Calculations:

=> Total distance to be covered = 130 + 120 = 250 m

=> Relative speed of trains = 62 − 44 = 18 km/hr

=> Convert relative speed to m/s: $18 \times (5/18) = 5$ m/s

=> Time taken by the faster train = 250 ÷ 5 = 50 sec

The final calculated time is 50 sec, which corresponds to option (2).

Therefore The correct answer is 50 sec.

Additional Information

Relative Speed Concepts

When two objects move in the same direction, Relative Speed = S1 − S2. When they move in opposite directions, Relative Speed = S1 + S2.

Unit Conversion

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

Train Crossing Distance

When a train crosses another train or a platform, the total distance covered is always the sum of their respective lengths.

Q4. Answer: (c) 12 hours

Shortcut Trick

Total Work (LCM of 10, 20, 30) = 60 units.

Efficiency of (A+B) = 6, (B+C) = 3, and Pipe B = 2.

Efficiency of Pipe A = 6 − 2 = 4; Efficiency of Pipe C = 3 − 2 = 1.

Combined Efficiency of (A+C) = 4 + 1 = 5 units/hr.

Time taken = 60 ÷ 5 = 12 hr.

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Therefore The correct answer is 12 hr.

Alternate Method

Given:

Time taken by (A + B) = 10 hr

Time taken by (B + C) = 20 hr

Time taken by Pipe B = 30 hr

Formula Used:

Efficiency = Total Work ÷ Time Taken

Person/Pipe	Days (hr)	Total Work	Efficiency
A + B	10	60	6
B + C	20	3	
B	30	2	

Calculations:

=> Efficiency of Pipe A = Efficiency of (A+B) − Efficiency of B

=> Efficiency of Pipe A = 6 − 2 = 4 units/hr

=> Efficiency of Pipe C = Efficiency of (B+C) − Efficiency of B

=> Efficiency of Pipe C = 3 − 2 = 1 unit/hr

=> Combined Efficiency of Pipe A and Pipe C = 4 + 1 = 5 units/hr

=> Time taken by A and C together = Total Work ÷ Combined Efficiency

=> Time = 60 ÷ 5 = 12 hr

Therefore The correct answer is 12 hr.

Additional Information

Pipes and Cisterns Concept

Filling pipes are considered to have positive efficiency, while emptying (leakage) pipes have negative efficiency.

Efficiency-Time Relationship

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

Combined Work Formula

If two pipes can fill a tank in x and y hours respectively, they together fill it in (x × y) ÷ (x + y) hours.

Q5. Answer: (a) 128

Shortcut Trick

LCM of the ratio parts (3, 7, and 2) = 3 × 7 × 2 = 42.

Relationship: HCF = Actual LCM ÷ LCM of ratio parts.

HCF = 5376 ÷ 42 = 128.

Therefore The correct answer is 128.

Alternate Method

Given: Ratio of three numbers = 3 : 7 : 2 and their LCM = 5376.

Formula: LCM(ax, bx, cx) = x × LCM(a, b, c), where x is the HCF.

Let the Highest Common Factor (HCF) be x.

The three numbers can be represented as 3x, 7x, and 2x.

=> LCM(3x, 7x, 2x) = 5376

=> x × LCM(3, 7, 2) = 5376

=> Since 3, 7, and 2 are prime numbers and have no common factors, their LCM = 3 × 7 × 2 = 42.

=> 42 × x = 5376

=> x = 5376 ÷ 42

=> x = 128

Therefore The correct answer is 128.

Additional Information

Relationship between HCF and LCM

For any two numbers a and b, HCF(a, b) × LCM(a, b) = a × b. Note: This rule does not directly apply to more than two numbers.

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LCM of Ratios

If numbers are in the ratio a : b : c, then their LCM = HCF × LCM(a, b, c).

Co-prime Numbers

If numbers are co-prime (pairwise), their HCF is 1 and their LCM is equal to the product of the numbers.

HCF and LCM Properties

The LCM of a set of integers is always exactly divisible by their HCF.

Q6. Answer: (a) 9450

Shortcut Trick

Identify a = 25, b = −7, and c = −18. First, check the sum: 25 + (−7) + (−18) = 0.

According to the algebraic identity, if a + b + c = 0, then $a^3 + b^3 + c^3 = 3abc$.

Required value = 3 × 25 × (−7) × (−18) = 75 × 126 = 9450.

Therefore The correct answer is 9450.

Alternate Method

Given: a = 25, b = −7, c = −18

Formula Used: $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

=> Check the sum of terms: a + b + c = 25 + (−7) + (−18)

=> a + b + c = 25 − 25 = 0

=> Substituting the zero sum into the identity: $a^3 + b^3 + c^3 - 3abc = 0 \times (a^2 + b^2 + c^2 - ab - bc - ca)$

=> $a^3 + b^3 + c^3 = 3abc$

=> Value = 3 × 25 × (−7) × (−18)

=> Value = 75 × 126 = 9450

Therefore The correct answer is 9450.

Additional Information

Conditional Algebraic Identity

When the sum of three variables a + b + c = 0, the expression $a^3 + b^3 + c^3$ simplifies directly to 3abc.

General Cubic Formula

The complete identity is $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$, useful for simplifying complex symmetric expressions.

Alternate Expansion

The term $(a^2 + b^2 + c^2 - ab - bc - ca)$ can also be written as $\frac{1}{2}[(a - b)^2 + (b - c)^2 + (c - a)^2]$.

Q7. Answer: (c) 93500

Shortcut Trick

Monthly Savings = 16000 − (6000 + 1500) = Rs. 8500

Savings for 11 months (as 1 month's savings is spent on birthday) = 8500 × 11

Total Yearly Savings = 93500

Therefore The correct answer is Rs. 93500.

Alternate Method

Given:

Monthly Salary = Rs. 16000

House Rent = Rs. 6000

Monthly Bills = Rs. 1500

Formula: Savings = Income − Expenditure

Step-by-step Calculation:

=> Total Monthly Expenditure = House Rent + Bills

=> Total Monthly Expenditure = 6000 + 1500 = Rs. 7500

=> Monthly Savings = Salary − Expenditure

=> Monthly Savings = 16000 − 7500 = Rs. 8500

=> Number of months in a year = 12

=> Savings are spent in 1 month (birthday month), so net savings occur for = 12 − 1 = 11 months

=> Total Savings in a year = Monthly Savings × 11

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=> Total Savings in a year = 8500 × 11

=> Total Savings in a year = Rs. 93500

Therefore, the correct option is (3).

Therefore The correct answer is Rs. 93500.

Additional Information

Income-Expenditure Relationship

Income is always the sum of Expenditure and Savings. If any two are known, the third can be calculated using Income − Expenditure = Savings.

Annual Calculation

To convert monthly data to annual data, multiply by 12. If a specific period involves extra spending or no savings, adjust the multiplier accordingly (e.g., use 11 instead of 12).

Savings Percentage

Savings % = (Savings ÷ Income) × 100. In this case, monthly savings % = (8500 ÷ 16000) × 100 = 53.125%.

Q8. Answer: (b) Rs. 12,800

Shortcut Trick

Simple Interest (SI) for 4 years = Rs. 3,200 → SI for 1 year = 3,200 ÷ 4 = Rs. 800.

Since the Rate is 10% per annum, 10% of Principal = Rs. 800 → Principal (100%) = Rs. 8,000.

Simple Interest for 6 years = 800 × 6 = Rs. 4,800.

Total Amount payable = Principal + SI for 6 years = 8,000 + 4,800 = Rs. 12,800.

Therefore The correct answer is Rs. 12,800.

Alternate Method

Given: Time (T1) = 4 years, Rate (R) = 10%, Simple Interest (SI1) = Rs. 3,200, Time (T2) = 6 years.

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

=> 3200 = (P × 10 × 4) ÷ 100

=> 3200 = (P × 40) ÷ 100

=> 40P = 3200 × 100

=> P = 320000 ÷ 40 = Rs. 8,000

=> Simple Interest for 6 years (SI2) = (8000 × 10 × 6) ÷ 100

=> SI2 = (8000 × 60) ÷ 100 = Rs. 4,800

=> Amount after 6 years (A) = Principal (P) + SI2

=> A = 8000 + 4800 = Rs. 12,800

Therefore The correct answer is Rs. 12,800.

Additional Information

Total Interest as Percentage

Total Simple Interest % = Rate × Time. For 4 years at 10%, it is 40% of the principal.

Amount Calculation Shortcut

Amount % = 100% + (Rate × Time)%. After 6 years at 10%, Amount = 160% of Principal.

Constant Rate and Principal

When Principal and Rate are constant, Simple Interest is directly proportional to Time (SI1/T1 = SI2/T2).

Q9. Answer: (b) 59

Given:

$8^2 + \sqrt{8^2} - \sqrt{49} - 6$

Formula used:

Square of a number: $a^2 = a \times a$

Square Root property: $\sqrt{a^2} = a$

Calculations:

$8^2 + \sqrt{8^2} - \sqrt{49} - 6$

=> 64 + 8 − 7 − 6 (Since $8^2 = 64$ and $\sqrt{49} = 7$)

=> 72 − 7 − 6

=> 65 − 6

=> 59

Therefore The correct answer is option (2).

Q10. Answer: (b) 131/3%

Shortcut Trick

Calculate unit price for both Cost Price (CP) and Selling Price (SP).

CP of 1 kg = 900 ÷ 20 = Rs. 45

SP of 1 kg = 918 ÷ 18 = Rs. 51

Profit Percentage = (SP − CP) ÷ CP × 100

Profit % = (6 ÷ 45) × 100 = 2/15 × 100 = 40/3% = 13(1/3)%

Therefore The correct answer is 13(1/3)%.

Alternate Method

Given:

Total Cost Price (CP) of 20 kg sugar = Rs. 900

Total Selling Price (SP) of 18 kg sugar = Rs. 918

Formula used:

Profit = Selling Price − Cost Price

Profit Percentage = (Profit ÷ Cost Price) × 100

Calculations:

=> Cost Price (CP) of 1 kg sugar = 900 ÷ 20 = Rs. 45

=> Selling Price (SP) of 1 kg sugar = 918 ÷ 18 = Rs. 51

=> Profit per kg = 51 − 45 = Rs. 6

=> Profit Percentage = (6 ÷ 45) × 100

=> Profit Percentage = (2/15) × 100 = 200/15

=> Profit Percentage = 40/3 = 13(1/3)%

Therefore The correct answer is 13(1/3)%.

Additional Information

Profit and Loss Basics

Profit occurs when SP > CP. Profit % is always calculated on the CP unless otherwise stated.

Fraction to Percentage Conversion

The fraction 1/15 is approximately equal to 6.66%. Thus, 2/15 = 2 × 6.66% = 13.33% or 13(1/3)%.

Unitary Method

To compare prices of different quantities, always find the value of a single unit (1 kg, 1 item, etc.) to simplify calculations.

Q11. Answer: (a) 3.24

Given:

324 × 24 = 7776

Formula used:

Dividend ÷ Divisor = Quotient

Calculations:

From the given data:

=> 7776 ÷ 24 = 324

We need to find the value of:

=> 7.776 ÷ 2.4

Multiplying both the dividend and divisor by 10 to simplify the decimal:

=> (7.776 × 10) ÷ (2.4 × 10) = 77.76 ÷ 24

Expressing 77.76 as a fraction:

=> 77.76 ÷ 24 = (7776 ÷ 100) ÷ 24

Rearranging the terms:

=> (7776 ÷ 24) ÷ 100

Substituting the known value 7776 ÷ 24 = 324:

=> 324 ÷ 100 = 3.24

Therefore The correct answer is option (1).

Q12. Answer: (d) 2:3

Shortcut Trick

Apply the alligation method using the average weights of boys (65) and girls (45) with the class mean (57).

Ratio of Boys to Girls = (57 − 45) : (65 − 57) = 12 : 8

Simplifying the ratio: 12 : 8 = 3 : 2 (Boys : Girls)

The question asks for the ratio of Girls to Boys, which is 2 : 3.

Therefore The correct answer is 2:3.

Alternate Method

Given:

Average weight of boys = 65 kg

Average weight of girls = 45 kg

Average weight of the whole class = 57 kg

Formula Used:

Total Weight = (Average Weight × Number of Students)

Let the number of boys be 'B' and girls be 'G'.

=> Total weight of class = 57 × (B + G)

=> Also, Total weight = 65B + 45G

=> 57B + 57G = 65B + 45G

=> 57G − 45G = 65B − 57B

=> 12G = 8B

=> G ÷ B = 8 ÷ 12

=> G : B = 2 : 3

Therefore The correct answer is 2:3.

Additional Information

Alligation Rule

It is a rule that enables us to find the ratio in which two or more ingredients at the given price must be mixed to produce a mixture of a specified price: (Quantity of Cheaper) ÷ (Quantity of Dearer) = (Price of Dearer − Mean Price) ÷ (Mean Price − Price of Cheaper).

Weighted Average Formula

The average of a combined group is given by $A_m = (n1A1 + n2A2) \div (n1 + n2)$, where n represents the quantity and A represents the average of each group.

Q13. Answer: (d) Rs. 769.50

Shortcut Trick

Total amount paid using the successive multiplier method:

Net Selling Price = 900 × (90/100) × (95/100)

Net Selling Price = 900 × 0.9 × 0.95

Net Selling Price = 810 × 0.95 = Rs. 769.50

Therefore The correct answer is Rs. 769.50.

Alternate Method

Given: Marked Price (MP) = Rs. 900, First Discount = 10%, Additional Discount = 5%.

Step-by-step calculation:

=> First discounted price = 900 − (10% of 900)

=> First discounted price = 900 − 90 = Rs. 810

=> Final amount paid = 810 − (5% of 810)

=> Final amount paid = 810 − 40.50 = Rs. 769.50

Therefore The correct answer is Rs. 769.50.

Additional Information

Single Equivalent Discount

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

Marked Price (MP) and Selling Price (SP)

Selling Price is calculated as SP = MP × (100 − Discount%)/100. For successive discounts, multiply each reduction factor.

Successive Discounts with Fraction

If discounts are 10% (1/10) and 5% (1/20), the price becomes 9/10 and 19/20 of the original value respectively.

Q14. Answer: (c) 125 : 216

Shortcut Trick

Initial radius ratio R1 : R2 = 2 : 3

New R1 = 2 × 150% = 3 units

New R2 = 3 × 120% = 3.6 units

New Radius Ratio = 3 : 3.6 = 5 : 6

Volume Ratio = (Radius Ratio)^3 = 5^3 : 6^3 = 125 : 216

Therefore The correct answer is 125 : 216.

Alternate Method

Given:

Ratio of radii R1 : R2 = 2 : 3

Increase in R1 = 50%

Increase in R2 = 20%

Formula Used:

Volume of a sphere (V) = (4/3) × π × R^3

Calculations:

Let the initial radii be R1 = 2x and R2 = 3x

=> New radius R'1 = 2x + 50% of 2x = 2x + x = 3x

=> New radius R'2 = 3x + 20% of 3x = 3x + 0.6x = 3.6x

=> Ratio of new volumes V'1 : V'2 = ((4/3)π(R'1)^3) : ((4/3)π(R'2)^3)

=> V'1 : V'2 = (R'1)^3 : (R'2)^3

=> V'1 : V'2 = (3x)^3 : (3.6x)^3

=> V'1 : V'2 = 27 : 46.656

=> Simplify the ratio: (3 / 3.6)^3 = (30 / 36)^3

=> (5 / 6)^3 = 125 : 216

Therefore The correct answer is 125 : 216.

Additional Information

Volume of Sphere

The volume of a sphere is given by V = (4/3)πr^3, where r is the radius.

Surface Area of Sphere

The total surface area of a sphere is S = 4πr^2.

Ratio Property

If the ratio of the radii of two spheres is a : b, then the ratio of their surface areas is a^2 : b^2 and the ratio of their volumes is a^3 : b^3.

Q15. Answer: (b) Rs. 7650

Shortcut Trick

Total Effective CP = 8000 + 500 = Rs. 8500

Net multiplier for 20% profit and 25% loss = 1.20 × 0.75 = 0.9

Final Price = 8500 × 0.9 = Rs. 7650

Therefore The correct answer is Rs. 7650.

Alternate Method

Given:

Purchase price of mobile phone = Rs. 8000

Amount spent on repairs = Rs. 500

Profit percentage = 20%

Loss percentage of the buyer = 25%

Formula Used:

Total CP = Cost Price + Overhead Expenses

Selling Price (SP) = CP × (100 + Profit%)/100 or CP × (100 − Loss%)/100

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Calculations:

=> Total CP for the trader = 8000 + 500 = Rs. 8500

=> Selling price of the trader (SP1) = 8500 + 20% of 8500

=> SP1 = 8500 + (20/100) × 8500 = 8500 + 1700 = Rs. 10200

=> This SP1 becomes the Cost Price for the first buyer (CP2 = Rs. 10200)

=> Final Selling Price (SP2) = 10200 − 25% of 10200

=> SP2 = 10200 − (25/100) × 10200 = 10200 − 2550 = Rs. 7650

Therefore The correct answer is Rs. 7650.

Additional Information

Overhead Expenses

Any additional costs like repairs, transportation, or installation must be added to the initial purchase price to determine the actual Cost Price.

Successive Percentage Changes

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

Successive Multiplication Factor

Final Value = Initial Value × (1 ± r1/100) × (1 ± r2/100) × ... where 'r' is the percentage profit (+) or loss (−).

Q16. Answer: (b) 27/35

Shortcut Trick

Check options based on the given conditions.

Condition 1: Denominator − Numerator = 8. For 27/35, 35 − 27 = 8 (Satisfied).

Condition 2: (Numerator + 3) / (Denominator + 5) = 3/4.

=> (27 + 3) / (35 + 5) = 30 / 40 = 3/4 (Satisfied).

Therefore The correct answer is 27/35.

Alternate Method

Given:

Numerator = Denominator − 8

New Numerator = Numerator + 3

New Denominator = Denominator + 5

New Fraction = 3/4

Calculations:

Let the denominator of the original fraction be x.

=> Numerator = x − 8

=> Original Fraction = (x − 8) / x

According to the question:

=> ((x − 8) + 3) / (x + 5) = 3 / 4

=> (x − 5) / (x + 5) = 3 / 4

By cross-multiplication:

=> 4 × (x − 5) = 3 × (x + 5)

=> 4x − 20 = 3x + 15

=> 4x − 3x = 15 + 20

=> x = 35

Now, find the numerator:

=> Numerator = 35 − 8 = 27

=> Original Fraction = 27/35

Therefore The correct answer is 27/35.

Additional Information

Proper and Improper Fractions

A Proper Fraction is one where the numerator is less than the denominator (e.g., 27/35). An Improper Fraction has a numerator greater than or equal to the denominator.

Equivalent Fractions

Fractions that represent the same value even though they look different, obtained by multiplying or dividing the numerator and

denominator by the same non-zero number.

Cross-Multiplication Rule

In an equation like a/b = c/d, the property a × d = b × c is used to solve for unknown variables in linear equations involving fractions.

Q17. Answer: (b) 54.9 meters

Shortcut Trick

Distance between two objects on the same side = Height × (cot θ_(smaller) − cot θ_(larger))

Distance = 75 × (cot 30° − cot 45°)

Distance = 75 × (√3 − 1) = 75 × (1.732 − 1)

Distance = 75 × 0.732 = 54.9 m

Therefore The correct answer is 54.9 m.

Alternate Method

Given:

Height of the lighthouse (AB) = 75 m

Angles of depression of two ships = 30° and 45°

Since the ships are on the same side, the angles of elevation from the ships to the top are also 30° and 45°.

Calculations:

=> In right ΔABC (closer ship at C):

=> tan 45° = AB ÷ BC

=> 1 = 75 ÷ BC => BC = 75 m

=> In right ΔABD (farther ship at D):

=> tan 30° = AB ÷ BD

=> 1 ÷ √3 = 75 ÷ BD => BD = 75√3 m

=> Distance between ships (CD) = BD − BC

=> CD = 75√3 − 75 = 75(√3 − 1)

=> CD = 75 × (1.732 − 1) = 75 × 0.732

=> CD = 54.9 m

Therefore The correct answer is 54.9 m.

Additional Information

Angle of Depression

The angle formed by the line of sight with the horizontal line for an object below the horizontal level.

Trigonometric Ratios

For height and distance problems, tan θ = Perpendicular ÷ Base and cot θ = Base ÷ Perpendicular are most commonly used.

General Formula for Same Side

Distance d = h × |cot α − cot β|, where h is height and α, β are angles of elevation/depression.

Q18. Answer: (b) 20/29

Given:

((13/21) / (13/10)) ÷ ((5/9 × 18/15) + 5/7) + 10/6 ÷ (29/15 of 15/6)

Formula used:

The VBODMAS rule (Vinculum, Bracket, Of, Division, Multiplication, Addition, Subtraction) is used to simplify the expression.

Calculations:

((13/21) × (10/13)) ÷ ((1/3 × 2/1) + 5/7) + 10/6 ÷ (29/15 × 15/6)

=> (10/21) ÷ (2/3 + 5/7) + 10/6 ÷ 29/6

=> (10/21) ÷ ((14 + 15) / 21) + (10/6 × 6/29)

=> (10/21) ÷ (29/21) + 10/29

=> (10/21 × 21/29) + 10/29

=> 10/29 + 10/29

=> 20/29

Therefore The correct answer is option (2).

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Q19. Answer: (c) 5

Shortcut Trick

Using the Net Deviation method where the Average is 15.

Deviations of given numbers from 15: (10 − 15) = −5, (20 − 15) = +5, (25 − 15) = +10.

Sum of known deviations = −5 + 5 + 10 = +10.

To keep the average 15, the total deviation must be 0; thus, the fourth number deviation = −10.

Fourth number = 15 − 10 = 5.

Therefore The correct answer is 5.

Alternate Method

Given:

Average of 4 numbers = 15

Three numbers are 10, 20, and 25.

Formula Used:

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

Calculations:

=> Let the fourth number be x.

=> Average = (10 + 20 + 25 + x) ÷ 4

=> 15 = (55 + x) ÷ 4

=> 15 × 4 = 55 + x

=> 60 = 55 + x

=> x = 60 − 55

=> x = 5

Therefore The correct answer is 5.

Additional Information

Sum of Observations

The total sum is always equal to Average × Number of items (Sum = A × n).

Net Deviation Rule

The algebraic sum of deviations of all observations from their arithmetic mean is always zero.

Change in Average

If a constant k is added to or subtracted from every observation, the new average will be (Old Average ± k).

Q20. Answer: (b) Rs. 1600

Shortcut Trick

Let the Marked Price (MP) be 100 units.

Cost Price (CP) for Ravi = 100 − 25% of 100 = 75 units.

Ravi sells it at 10% profit => Selling Price (SP) = 75 × 110 ÷ 100 = 82.5 units.

Given SP = Rs. 1,320 => 82.5 units = 1320.

1 unit = 1320 ÷ 82.5 = 16.

Marked Price = 100 units = 100 × 16 = Rs. 1,600.

Therefore The correct answer is Rs. 1600.

Alternate Method

Given: Discount = 25%, Profit = 10%, Selling Price (SP) = Rs. 1,320.

Formulas: CP = SP × 100 ÷ (100 + Profit%); MP = CP × 100 ÷ (100 − Discount%)

=> First, find the Cost Price (CP) for Ravi: CP = 1320 × 100 ÷ 110 = Rs. 1,200.

=> This CP is the price after a 25% discount on the Marked Price (MP).

=> Let MP be x. Then, 75% of x = 1200.

=> x = (1200 × 100) ÷ 75 = 16 × 100 = Rs. 1,600.

Therefore The correct answer is Rs. 1600.

Additional Information

Marked Price & Discount

The Marked Price (MP) is the price printed on an item. Discount is always calculated on the MP to arrive at the Selling Price (SP).

Relation between CP and MP

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CP ÷ MP = (100 − Discount%) ÷ (100 + Profit%). This direct ratio helps find MP when CP and profit/discount percentages are known.

Q21. Answer: (b) 4,125

Shortcut Trick

Total percentage interest = Rate × Time = 8% × 4 = 32%.

According to the question, 32% of the Principal = Rs. 1,320.

1% of the Principal = 1320 ÷ 32 = 41.25.

100% (Original Sum) = 41.25 × 100 = Rs. 4,125.

Therefore The correct answer is Rs. 4,125.

Alternate Method

Given:

Simple Interest (SI) = Rs. 1,320

Rate of Interest (R) = 8% per annum

Time (T) = 4 years

Formula Used:

Principal (P) = (Simple Interest × 100) ÷ (Rate × Time)

Calculations:

=> P = (1320 × 100) ÷ (8 × 4)

=> P = 132000 ÷ 32

=> P = 4125

Therefore The correct answer is Rs. 4,125.

Additional Information

Amount in Simple Interest

The total Amount (A) is the sum of the Principal and the Simple Interest: A = P + SI.

Compound Interest (CI)

Unlike Simple Interest, Compound Interest is calculated on the Principal plus the interest accumulated over previous periods: $A = P(1 + r/100)^n$.

Difference between SI and CI

For a period of 1 year at the same rate, Simple Interest and Compound Interest are always equal, provided the interest is compounded annually.

Rule of 72

A quick way to estimate how long it takes to double your money with Compound Interest: Time ≈ 72 ÷ Interest Rate.

Q22. Answer: (a) 45,705

Shortcut Trick

Ratio of Profit = Ratio of Investments (since time is the same).

Profit Ratio of P : Q = 3000 : 600 = 5 : 1.

Total units = 5 + 1 = 6 units → Rs. 54,846.

P's share (5 units) = (54,846 ÷ 6) × 5 = 9,141 × 5 = Rs. 45,705.

Therefore The correct answer is Rs. 45,705.

Alternate Method

Given:

Investment of P = Rs. 3,000

Investment of Q = Rs. 600

Total Profit at the end of 1 year = Rs. 54,846

Formula Used:

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

Calculations:

=> Profit Ratio (P : Q) = 3000 : 600

=> Profit Ratio (P : Q) = 5 : 1

=> Sum of ratios = 5 + 1 = 6

=> P's share in profit = (5 / 6) × 54,846

=> P's share = 5 × 9,141

=> P's share = Rs. 45,705

Therefore The correct answer is Rs. 45,705.

Additional Information

Basic Rule of Partnership

Profit is distributed in the ratio of the product of Capital and Time Period (P = C × T).

Variable Time Investment

If P invests for T1 months and Q for T2 months, their profit ratio is (C1 × T1) : (C2 × T2).

Active vs. Sleeping Partner

An active partner may receive an additional salary or commission from the total profit before the remaining profit is shared according to the investment ratio.

Q23. Answer: (d) 282

Shortcut Trick

Total Area = Area1 + Area2 + Area3

Area3 = 1/2 × 12 × 38 = 6 × 38 = 228 cm²

Summing all areas => 24 + 30 + 228 = 282 cm²

Therefore The correct answer is 282 cm².

Alternate Method

Given:

Area of Triangle 1 = 24 cm²

Area of Triangle 2 = 30 cm²

Base of Triangle 3 = 12 cm, Height of Triangle 3 = 38 cm

Formula Used:

Area of a Triangle = (1/2) × base × height

Total Area of Pentagon = Area of Triangle 1 + Area of Triangle 2 + Area of Triangle 3

Calculations:

=> Area of first triangle = 24 cm²

=> Area of second triangle = 30 cm²

=> Area of third triangle = (1/2) × 12 × 38

=> Area of third triangle = 6 × 38 = 228 cm²

=> Total Area of Pentagon = 24 + 30 + 228

=> Total Area of Pentagon = 54 + 228 = 282 cm²

Therefore The correct answer is 282 cm².

Additional Information

Polygon Triangulation

Any convex polygon with n sides can be divided into (n − 2) triangles by drawing all possible diagonals from a single vertex.

Additive Property of Area

The total area of a geometric figure is the sum of the areas of its non-overlapping constituent parts.

Sum of Interior Angles

The sum of the interior angles of a pentagon (5 sides) is (5 − 2) × 180° = 540°.

Q24. Answer: (c) 23.17%

Shortcut Trick

To find the net percentage change for successive increases of a% and b%, use the formula: a + b + (a × b)/100

Here, a = 9% and b = 13%

Total percentage increase = 9 + 13 + (9 × 13)/100

Total percentage increase = 22 + 117/100 = 22 + 1.17 = 23.17%

Therefore The correct answer is 23.17%.

Alternate Method

Given:

First increase = 9%

Second increase = 13%

Calculations:

=> Let the initial price of the article be 100.

=> Price after first increase (9%) = 100 + (9% of 100) = 109.

=> Price after second increase (13%) = 109 + (13% of 109).

=> Price after second increase = 109 + (13 × 109)/100 = 109 + 14.17 = 123.17.

=> Net increase in price = 123.17 − 100 = 23.17.

=> Percentage increase = (23.17 / 100) × 100 = 23.17%.

Therefore The correct answer is 23.17%.

Additional Information

Successive Percentage Change

When a value is changed by x% and then by y%, the effective change is [x + y + (xy/100)]%.

Successive Discounts

For two successive discounts of d1% and d2%, the single equivalent discount is [d1 + d2 − (d1 × d2)/100]%.

Multiplying Factor Method

Final Value = Initial Value × (1 + r1/100) × (1 + r2/100), where r1 and r2 are the percentage increase rates.

Q25. Answer: (a) 70

Shortcut Trick

The number N must divide (228 − 18) = 210.

According to the remainder rule, the divisor N must be greater than the remainder 18 (N > 18).

List factors of 210 in descending order: 210, 105, 70, 42, 35, 30, 21, 15...

The largest two-digit factor that satisfies N > 18 is 70.

Therefore The correct answer is 70.

Alternate Method

Given: Dividend = 228, Remainder = 18.

Formula Used: Dividend = (Divisor × Quotient) + Remainder

=> Let the divisor be N and the quotient be q.

=> 228 = (N × q) + 18

=> N × q = 228 − 18 = 210

=> This implies N is a factor of 210.

=> Factors of 210 = 1, 2, 3, 5, 6, 7, 10, 14, 15, 21, 30, 35, 42, 70, 105, 210.

=> Two-digit factors of 210 are 10, 14, 15, 21, 30, 35, 42, 70.

=> Since the remainder is 18, N must be greater than 18.

=> Possible values for N = 21, 30, 35, 42, 70.

=> The greatest two-digit value of N is 70.

Therefore The correct answer is 70.

Additional Information

Euclid's Division Lemma

For any two positive integers a and b, there exist unique integers q and r such that a = bq + r, where 0 ≤ r < b.

Divisor and Remainder Relationship

The divisor is always strictly greater than the remainder. If a number divides another with a remainder r, then the divisor must be a factor of (Dividend − r).

Finding Factors

To find all factors of a number, check divisibility by integers from 1 up to the square root of that number.

Q26. Answer: (a) 104°

Shortcut Trick

Combine all terms of x and constants in the Angle Sum Property equation:

=> (3x + 6x + 4x) + (−7 − 14 + 6) = 180

=> 13x − 15 = 180 => 13x = 195 => x = 15

Required sum angle A + angle C = (3x − 7) + (4x + 6) = 7x − 1

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=> 7(15) − 1 = 105 − 1 = 104°

Therefore The correct answer is 104°.

Alternate Method

Given:

angle A = (3x − 7)°

angle B = 2angle A = 2(3x − 7) = (6x − 14)°

angle C = (4x + 6)°

According to the Angle Sum Property of a triangle:

=> angle A + angle B + angle C = 180°

=> (3x − 7) + (6x − 14) + (4x + 6) = 180

=> 13x − 15 = 180

=> 13x = 180 + 15

=> 13x = 195

=> x = 195 ÷ 13

=> x = 15

Now, substitute the value of x to find the angles:

=> angle A = 3(15) − 7 = 45 − 7 = 38°

=> angle C = 4(15) + 6 = 60 + 6 = 66°

Sum of angle A and angle C:

=> angle A + angle C = 38° + 66° = 104°

Therefore The correct answer is 104°.

Additional Information

Angle Sum Property

The sum of the interior angles of any triangle is always 180°. This is a fundamental property in Euclidean geometry.

Exterior Angle Theorem

The exterior angle of a triangle is equal to the sum of the two opposite interior angles. For instance, Exterior angle ACD = angle A + angle B.

Types of Triangles by Angles

An Acute triangle has all angles < 90°, a Right triangle has one angle = 90°, and an Obtuse triangle has one angle > 90°.

Q27. Answer: (b) 2 : 1

Shortcut Trick

In both cases, the relative speed (S_F − S_S) remains the same.

Time to pass total distance (L_F + L_S) = 36 sec.

Time for passenger in faster train to pass length L_S = 12 sec.

=> (L_F + L_S) : L_S = 36 : 12 = 3 : 1

=> L_F : L_S = (3 − 1) : 1 = 2 : 1

Therefore The correct answer is 2 : 1.

Alternate Method

Given:

Time taken to pass slower train completely = 36 sec.

Time taken by passenger to pass slower train = 12 sec.

Let length of faster train be L_F and slower train be L_S.

Let speeds be S_F and S_S. Relative speed V_R = S_F − S_S.

Formula: Distance = Relative Speed × Time

=> Case 1: L_F + L_S = (S_F − S_S) × 36 --- (1)

=> Case 2: L_S = (S_F − S_S) × 12 --- (2)

=> From (2), (S_F − S_S) = L_S / 12

=> Substitute in (1): L_F + L_S = (L_S / 12) × 36

=> L_F + L_S = 3 × L_S

=> L_F = 3L_S − L_S = 2L_S

=> L_F / L_S = 2 / 1

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Therefore The correct answer is 2 : 1.

Additional Information

Relative Speed Concept

When two objects move in the same direction, relative speed is (S1 − S2). If they move in opposite directions, relative speed is (S1 + S2).

Train Crossing a Point Object

When a train passes a passenger, a pole, or a stationary man, the distance covered is exactly equal to the length of the train (or the length of the train being observed).

Unit Conversion

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

Q28. Answer: (c) 5

Shortcut Trick

Assume total work as LCM(12, 6) = 12 units.

Efficiency: A = 1 unit/day, B = 2 units/day.

Combined efficiency of A + B = 3 units/day.

Work done in 2 days = 3 × 2 = 6 units.

Remaining work = 12 − 6 = 6 units, completed by B in 6 ÷ 2 = 3 days.

Total time taken = 2 + 3 = 5 days.

Therefore The correct answer is 5 days.

Alternate Method

Given:

Time taken by A = 12 days

Time taken by B = 6 days

Formula Used:

Efficiency = Total Work ÷ Time

Person	Days	Total Work (LCM)	Efficiency
A	12	12	12 ÷ 12 = 1
B	6	12 ÷ 6 = 2	

=> Total Work = 12 units.

=> Work done by A and B in 2 days = (1 + 2) × 2 = 6 units.

=> Remaining work to be completed by B = 12 − 6 = 6 units.

=> Time taken by B to finish remaining work = 6 ÷ 2 = 3 days.

=> Total time for the whole work = Work together + Work by B alone = 2 + 3 = 5 days.

Therefore The correct answer is 5 days.

Additional Information

Efficiency and Time Relationship

Efficiency is inversely proportional to the time taken to complete the work. If the ratio of time is x:y, the ratio of efficiency is y:x.

Work and Wages

Wages are generally distributed in the ratio of the work done by each individual, which is the product of their efficiency and the time they worked.

Combined Work Formula

If A can do a work in x days and B in y days, then together they can do it in (x × y) ÷ (x + y) days.

Q29. Answer: (d) Rs. 1,232

Shortcut Trick

Total amount to be divided after deductions = 5278 − (67 + 61 + 68) = Rs. 5,082.

Sum of ratio parts = 8 + 20 + 5 = 33 units.

Value of 1 unit = 5082 ÷ 33 = 154.

X's share after deduction = 8 units = 8 × 154 = Rs. 1,232.

Therefore The correct answer is Rs. 1,232.

Alternate Method

Given:

Total amount = Rs. 5,278

Deductions from X, Y, and Z = Rs. 67, Rs. 61, and Rs. 68

Ratio after deduction = 8 : 20 : 5

Calculations:

=> Sum of deductions = 67 + 61 + 68 = Rs. 196

=> Amount remaining after deduction = 5278 − 196 = Rs. 5,082

=> Let the parts be 8k, 20k, and 5k

=> 8k + 20k + 5k = 5082

=> 33k = 5082

=> k = 5082 ÷ 33 = 154

=> X's share after deduction = 8k = 8 × 154 = 1232

Therefore The correct answer is Rs. 1,232.

Additional Information

Ratio and Proportion

To divide a quantity S in the ratio a : b : c, the parts are [a/(a+b+c)] × S, [b/(a+b+c)] × S, and [c/(a+b+c)] × S respectively.

Deduction Rule

When fixed amounts are subtracted from the original shares to get a new ratio, always subtract the sum of those amounts from the total capital first.

Unitary Method in Ratios

Finding the value of '1 unit' by dividing the total quantity by the sum of ratio terms is the fastest way to calculate individual components.

Q30. Answer: (a) 290.405

Shortcut Trick

The third proportional (x) to two numbers a and b is calculated using the direct formula: $x = b^2 \div a$.

Given: a = 8 and b = 48.2.

Substituting the values: x = (48.2 × 48.2) ÷ 8

x = 2323.24 ÷ 8 = 290.405.

Therefore The correct answer is 290.405.

Alternate Method

Given:

First number (a) = 8

Second number (b) = 48.2

Formula Used:

Three numbers a, b, and x are in continued proportion if the ratio of the first to the second is equal to the ratio of the second to the third: a : b = b : x.

Calculations:

=> 8 ÷ 48.2 = 48.2 ÷ x => 8 × x = 48.2 × 48.2 => 8x = 2323.24 => x = 2323.24 ÷ 8 => x = 290.405

Therefore The correct answer is 290.405.

Additional Information

Mean Proportional

The mean proportional between two numbers a and b is √(a × b). It is the middle term when three numbers are in continued proportion.

Fourth Proportional

For four numbers a, b, c, d to be in proportion (a : b :: c : d), the fourth proportional is given by d = (b × c) ÷ a.

Continued Proportion

Numbers a, b, c, d... are said to be in continued proportion if a/b = b/c = c/d and so on.

Q31. Answer: (c) Polaroid

The correct answer is Polaroid.

Key Points

• Light is an electromagnetic wave characterized by oscillations of electric and magnetic field vectors. These oscillations occur in a direction perpendicular to the direction of wave propagation, which defines the transverse nature of light.

• The phenomenon of polarization is the most definitive proof of this transverse nature. Only transverse waves can be polarized; longitudinal waves, such as sound waves, cannot undergo polarization because their vibrations occur along the same axis as the direction of travel.

• A Polaroid is an optical filter made of materials like herapathite (iodoquinine sulfate) or synthetic polymers that contain aligned molecular chains. These chains absorb light waves vibrating in one plane while allowing those in the perpendicular plane, known as the transmission axis, to pass through.

• When unpolarized light hits a Polaroid, it emerges as plane-polarized light. If a second Polaroid is placed behind the first and rotated by 90 degrees (crossed position), the light intensity drops to zero. This experiment demonstrates that light waves possess a specific spatial orientation, confirming their transverse characteristics.

Additional Information

• Other optical components and their functions:

• Lens: A transmissive optical device that focuses or disperses a light beam by means of refraction. While it proves light behaves as a wave, it does not specifically demonstrate the transverse orientation of the oscillations.

• Prism: A transparent element with flat surfaces that refracts light. It is famously used to show dispersion, where white light is split into its constituent spectral colors (VIBGYOR) due to different refractive indices for different wavelengths.

• Mirror: A surface typically made of polished metal or glass with a reflective coating that demonstrates the laws of reflection. Reflection occurs for both transverse and longitudinal waves and thus does not isolate the transverse nature of light.

Q32. Answer: (c) Karnataka High Court

The correct answer is Karnataka High Court.

Key Points

• On September 24, 2025, a single-judge Bench of the Karnataka High Court, led by Justice M. Nagaprasanna, dismissed a writ petition filed by tech giant X Corp (formerly Twitter).

• The Court decisively upheld the legal validity of the Union government\'s Sahyog portal, declaring it an \'instrument of public good\' designed to regulate digital communication and prevent online harms.

• The petitioner argued that the portal bypassed the procedural safeguards of Section 69A. However, the Court ruled that the portal is a valid administrative facilitation mechanism to implement intermediaries\' obligations under Section 79(3)(b) of the Information Technology Act, 2000 read with Rule 3(1)(d) of the IT Rules, 2021.

• The Bench also emphasized that free speech under Article 19(1)(a) is not absolute and is restricted by Article 19(2). It ruled that Article 19 fundamental rights are citizen-centric and cannot be claimed by foreign corporate entities.

Additional Information

• Sahyog Portal:

• Developed by the Indian Cyber Crime Coordination Centre (I4C) under the aegis of the Ministry of Home Affairs (MHA).

• Functions as a centralized, automated platform connecting online intermediaries, central agencies, and state/UT nodal officers to expedite content takedown notices.

• Statutory Provisions:

• Section 79(3)(b) of the IT Act: Mandates that intermediaries must expeditiously remove or disable access to unlawful content upon receiving actual knowledge, or risk losing their \'safe harbour\' immunity.

• Rule 3(1)(d) of the IT Rules, 2021: Prescribes due diligence obligations for social media platforms to remove unlawful material within a stipulated period.

• Other High Courts:

• While related procedural aspects were touched upon by the Delhi High Court and subsequent challenges were filed in the Bombay High Court, they did not deliver the September 2025 ruling.

Q33. Answer: (a) Chlor-alkali process

The correct answer is Chlor-alkali process.

Key Points

• The Chlor-alkali process is a fundamental industrial method used for the electrolysis of an aqueous solution of sodium chloride, which is commonly known as brine.

• When an electric current is passed through brine, the sodium chloride decomposes chemically. The water (H_2O) and salt ($NaCl$) molecules break apart and rearrange to form three key substances.

• The name of the process is derived from its major products: Chlor refers to chlorine gas, and alkali refers to sodium hydroxide (an alkaline substance).

• During the reaction, chlorine gas (Cl_2) is liberated at the anode (the positive electrode), while hydrogen gas (H_2) is released at

the cathode (the negative electrode).

• Sodium hydroxide (NaOH) solution is formed near the cathode. This compound is a strong base widely used in various chemical industries.

• The overall balanced chemical equation for this electrolytic reaction is: $2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$.

Additional Information

• Filtration process:

• It is a physical separation technique used to separate insoluble solid particles from a liquid or gas by passing the mixture through a filter medium.

• Unlike the Chlor-alkali process, it does not involve chemical decomposition or the use of electricity to create new substances.

• Sublimation process:

• This is a thermodynamic phase transition where a substance changes directly from a solid state to a gaseous state without becoming a liquid.

• Common examples in chemistry include camphor, naphthalene, and solid carbon dioxide (dry ice).

• Polymerisation process:

• It is a chemical reaction where small molecules called monomers react together to form a large, complex molecule called a polymer.

• This process is essential for manufacturing materials like polythene, nylon, and teflon.

• Uses of Chlor-alkali products:

• Chlorine: Used in water sterilization, swimming pools, and the production of PVC and CFCs.

• Sodium Hydroxide: Crucial for soap and detergent manufacturing, paper making, and degreasing metals.

• Hydrogen: Utilized as a clean fuel, in the production of ammonia for fertilizers, and in the hydrogenation of vegetable oils.

Q34. Answer: (c) Separate electorates for Muslims

The correct answer is Separate electorates for Muslims.

Key Points

• The Indian Councils Act 1909, commonly known as the Morley-Minto Reforms, was named after Lord Morley (the then Secretary of State for India) and Lord Minto (the then Viceroy of India).

• A core provision of this act was the introduction of Separate Electorates for Muslims, which meant that Muslim representatives would be chosen exclusively by Muslim voters in designated constituencies.

• This acceptance stemmed from the Simla Deputation of October 1, 1906, where a group of Muslim elites led by the Aga Khan met Lord Minto to demand political safeguards for their community.

• The British government favored this demand as part of their Divide and Rule strategy, aiming to create a communal divide within the rising Indian National Movement and the Indian National Congress.

• The act also increased the number of members in the Central Legislative Council from 16 to 60, though the official majority was maintained by the British.

Additional Information

• Lord Minto is often referred to as the Father of Communal Electorate because he institutionalized communalism in the Indian political structure.

• The incorrect options refer to different historical milestones:

• Partition of India: This was a much later development resulting from the Mountbatten Plan and the Indian Independence Act of 1947.

• Universal Adult Franchise: This principle, granting every adult the right to vote regardless of property or education, was only adopted in the Constitution of India in 1950 under Article 326.

• Complete Independence: The goal of Purna Swaraj was formally adopted by the Indian National Congress at the Lahore Session in 1929, presided over by Jawaharlal Nehru.

• The Morley-Minto Reforms were eventually criticized for being a shadow without substance, as they gave limited power to Indians while cementing religious divisions.

Q35. Answer: (d) Promotion of international trade relations

The correct answer is Promotion of international trade relations.

Key Points

• Article 39 of the Indian Constitution is a significant provision within the Directive Principles of State Policy (DPSP), located in Part IV. It mandates the State to direct its policy toward securing specific social and economic rights for its citizens.

• Article 39(d) specifically directs the State to ensure there is equal pay for equal work for both men and women, aiming to eliminate gender discrimination in wages.

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• Article 39(e) focuses on the protection of the strength and health of workers, ensuring that the physical well-being of men, women, and children is not abused and that citizens are not forced by economic necessity to enter vocations unsuited to their age or strength.

• Article 39(f) emphasizes the prevention of exploitation of childhood and youth, requiring the State to provide opportunities for children to develop in a healthy manner and in conditions of freedom and dignity.

• Promotion of international trade relations is not mentioned in Article 39. While the Constitution addresses international relations, it is primarily covered under Article 51, which promotes international peace and security.

Additional Information

• Directive Principles of State Policy (DPSP):

• The DPSP (Articles 36 to 51) are inspired by the Irish Constitution and are fundamental in the governance of the country, though they are non-justiciable in a court of law.

• Article 39A: Added by the 42nd Amendment Act of 1976, it requires the State to provide free legal aid to ensure that opportunities for securing justice are not denied to any citizen by reason of economic or other disabilities.

• Article 51: This article specifically directs the State to promote international peace and security, maintain just and honorable relations between nations, and encourage the settlement of international disputes by arbitration.

• 42nd Amendment Act: This amendment also modified Article 39(f) to its current form, strengthening the protection of children and youth from exploitation.

Q36. Answer: (c) 18-40 years

The correct answer is 18-40 years.

Key Points

• The Atal Pension Yojana (APY) was officially launched on May 9, 2015, by the Government of India to provide a sustainable financial safety net for workers in the unorganized sector.

• Eligibility for the scheme is strictly limited to Indian citizens within the age group of 18 to 40 years, which allows for a substantial accumulation phase before retirement.

• The scheme requires a minimum contribution period of 20 years, ensuring that even those joining at the maximum age of 40 contribute until they reach the vesting age of 60 years.

• Subscribers are guaranteed a fixed monthly pension of Rs. 1,000, Rs. 2,000, Rs. 3,000, Rs. 4,000, or Rs. 5,000, depending on the volume of their monthly contributions and the age at which they joined the scheme.

• The Government of India originally offered a co-contribution of 50% of the total contribution (up to Rs. 1,000 per annum) for five years to eligible subscribers who joined before December 31, 2015.

Additional Information

• Regulatory Framework:

• The scheme is administered and regulated by the Pension Fund Regulatory and Development Authority (PFRDA) under the institutional architecture of the National Pension System (NPS).

• It was introduced to replace the Swavalamban Yojana, aiming for better coverage and more structured pension benefits for the marginalized workforce.

• Post-1991 Reform Context:

• As part of the post-liberalization era, the focus shifted toward inclusive growth, necessitating schemes like APY to mitigate the lack of formal social security in the private and informal labor markets.

• Taxpayer Exclusion:

• In a significant policy update effective from October 1, 2022, any individual who is an income taxpayer is no longer eligible to join the Atal Pension Yojana, further targeting the scheme toward the economically weaker sections.

Q37. Answer: (b) George V and Queen Mary

The correct answer is George V and Queen Mary.

Key Points

• The Gateway of India is a monumental arch-monument built during the 20th century in Mumbai (formerly Bombay), India.

• It was constructed to commemorate the first-ever visit of a British monarch to India, specifically King George V and Queen Mary, who landed at Apollo Bunder in December 1911.

• The royal couple was visiting the country for the Delhi Durbar, where George V was formally proclaimed the Emperor of India.

• The design of the structure was finalized by the British architect George Wittet, who combined elements of Roman triumphal arches with 16th-century Gujarati architecture.

• While the foundation stone was laid on March 31, 1913, the actual construction was completed in 1924, and the monument was inaugurated by the Viceroy, the Earl of Reading.

• The structure is built using yellow basalt and reinforced concrete, standing at a height of 26 meters (85 feet).

Additional Information

• Indo-Saracenic Architecture:

• This architectural style, also known as Indo-Gothic, was used for the Gateway of India to blend Islamic and Hindu design elements with British colonial aesthetics.

• Key features include latticework (jalis), domes, and minarets, which are prevalent in the archaeological heritage of Gujarat.

• Historical Significance of the Site:

• The Gateway of India served as the ceremonial entrance for important colonial personnel, including Viceroys and Governors.

• Ironically, it also marked the end of British Rule in India when the last British troops, the First Battalion of the Somerset Light Infantry, marched through the arch on February 28, 1948, to depart the country.

• Delhi Durbar 1911:

• During this visit, the capital of British India was shifted from Calcutta to Delhi.

Q38. Answer: (a) Lepcha

The correct answer is Lepcha.

Key Points

• The Lepcha people are the indigenous inhabitants of Sikkim, and their traditional music forms a vital part of the state's rich cultural heritage.

• Lepcha folk music is deeply rooted in nature, with lyrics often describing the majestic Kanchenjunga range, the flora and fauna of the Himalayas, and ancient legends of the tribe.

• Traditional instruments such as the Sut-Sung-Vo (a bamboo flute) and the Satsang are frequently used to provide melodic accompaniment to these folk songs.

• These musical styles are typically performed during social gatherings and festivals, serving as a medium to pass down ancestral stories and oral traditions to younger generations.

• The music emphasizes a spiritual connection with the land, reflecting the animistic beliefs of the Lepcha community before the widespread influence of later religions.

Additional Information

• Bihu songs:

• State of Origin: Assam.

• Context: These are energetic folk songs performed during the Bihu festivals, particularly Rongali Bihu, celebrating the Assamese New Year and the onset of the seeding season.

• Baul:

• State of Origin: West Bengal.

• Context: A unique group of mystic minstrels whose music is recognized by UNESCO; it blends elements of Sufism and Vaishnavism to express the search for the divine within man.

• Lavani:

• State of Origin: Maharashtra.

• Context: A combination of traditional song and dance performed to the rhythmic beats of the Dholki, known for its powerful rhythm and themes ranging from social issues to romance.

Q39. Answer: (d) Read Only Memory

The correct answer is Read Only Memory.

Key Points

• Read Only Memory (ROM) refers to a type of non-volatile storage medium that permanently stores data on personal computers and other electronic devices.

• As the name suggests, the data stored in ROM can traditionally only be read and is either difficult or impossible to modify once written during the manufacturing process.

• It is essential for the booting process of a computer, as it contains the BIOS (Basic Input/Output System), which provides the necessary instructions to initialize hardware components and load the operating system.

• Being non-volatile, ROM does not lose its contents when the power is switched off, making it ideal for storing firmware and critical system software.

Additional Information

• Types of ROM:

• PROM (Programmable ROM): A version that can be programmed by the user once using a PROM programmer, but cannot be erased thereafter.

• EPROM (Erasable Programmable ROM): The stored data can be erased by exposing the chip to high-intensity ultraviolet (UV)

light, allowing it to be reprogrammed.

• EEPROM (Electrically Erasable Programmable ROM): This type allows data to be erased and rewritten electrically without removing it from the computer, which is the foundational technology for Flash Memory.

• Comparison with RAM:

• Unlike ROM, RAM (Random Access Memory) is volatile memory, meaning it requires constant power to maintain stored information and is used for temporary data processing.

Q40. Answer: (d) Uttar Pradesh

The correct answer is Uttar Pradesh.

Key Points

• According to the Census 2011 data, Uttar Pradesh recorded the highest number of children in the 0-6 years age group among all Indian states, with a total count of 3,07,91,331.

• This child population accounts for approximately 15.41% of the state's total population, which was nearly 19.98 Crore as per the same census.

• The state of Uttar Pradesh alone contributed about 18.7% to India's total child population in the 0-6 years category.

• The high volume of the child population is consistent with the fact that Uttar Pradesh is the most populous state in the country.

Additional Information

• Bihar:

• It recorded the second-highest child population (0-6 years) in India, totaling 1,91,33,964.

• Notably, Bihar had the highest percentage of children relative to its total population among the major states, at 18.38%.

• Maharashtra:

• Ranked third in terms of the child population (0-6 years) with a total of 1,33,26,202.

• It is the second most populous state in India overall, following Uttar Pradesh.

• Rajasthan:

• Recorded a child population of 1,06,49,504, which represented approximately 15.5% of its total state population.

• General Census Facts:

• The total child population (0-6 years) in India was recorded at 16,44,78,150 in 2011.

• The national Child Sex Ratio (0-6 years) saw a decline from 927 in 2001 to 919 in 2011.

Therefore, the correct option is 4.

Q41. Answer: (b) System Software

The correct answer is System Software.

Key Points

• System Software serves as the essential intermediary layer between the computer hardware and the Application Software, ensuring that the system resources are managed efficiently.

• The core component of system software described is the Kernel, which is the first program loaded into the Random Access Memory (RAM) during the Boot Process after the BIOS or UEFI firmware handoff.

• It is responsible for Memory Management, which involves tracking every memory location and determining how much memory to allocate to different processes to prevent Memory Leaks and system instability.

• The software handles Process Scheduling by using algorithms like Round Robin or First-Come-First-Served to allocate CPU time, enabling Multitasking and the concurrent execution of multiple programs.

• To ensure system security and stability, this software operates in Privileged Mode (also known as Kernel Mode), which allows it to execute restricted CPU instructions and access all physical hardware directly, a privilege denied to standard user applications.

Additional Information

• Application Software:

• These are programs designed for end-users to perform specific tasks, such as Web Browsers (Chrome), Word Processors (MS Word), or Database Management Systems (MySQL).

• They run in User Mode and must request hardware resources through System Calls made to the operating system.

• Utility Software:

• This category focuses on the maintenance and optimization of the computer, providing tools like Disk Defragmenters, Antivirus software, and File Compression utilities.

• Unlike the kernel, these are typically not required for the basic operation of the hardware but enhance its performance and security.

• Driver Software:

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• Specialized programs that allow the Operating System to communicate with specific hardware devices like Printers, Graphics Cards, and Network Adapters.

• They act as a translator, converting general OS commands into instructions the specific hardware can understand.

Q42. Answer: (b) Singapore

The correct answer is Singapore.

Key Points

• Singapore has officially secured the top spot in the Henley Passport Index for the 2024-2025 cycle, distinguishing itself as the most powerful passport in the world.

• Citizens of Singapore now enjoy unprecedented visa-free or visa-on-arrival access to 195 out of 227 travel destinations globally.

• The Henley Passport Index is a global ranking based on exclusive data from the International Air Transport Association (IATA), which is the world's largest and most accurate travel information database.

• The index includes 199 different passports and is updated throughout the year to reflect changes in visa policies and international relations.

• Singapore had previously shared the top position with other European nations and Japan, but recent diplomatic expansions have allowed it to pull ahead as the sole leader.

Additional Information

• Comparative Rankings:

• Japan: After holding the top spot for five consecutive years, Japan currently ranks in second place, sharing the position with Germany, France, Italy, and Spain, all providing access to 192 destinations.

• Germany: A consistent top performer in Europe, Germany maintains strong diplomatic ties, ensuring its citizens can visit 192 locations without a prior visa.

• China: While China has seen significant improvement in its ranking over the last decade due to new visa-exemption agreements, it remains further down the list compared to the leading nations.

• Index Methodology:

• The score for a passport is calculated by assigning a value of 1 for every destination where no visa is required, or where a visa on arrival, visitor's permit, or Electronic Travel Authority (ETA) can be obtained.

• The Henley & Partners research team uses 19 years of historical data to track how global mobility has evolved, noting a general trend toward increased travel freedom worldwide.

Q43. Answer: (d) 34.2 %

The correct answer is 34.2 %.

Key Points

• The Labour Force Participation Rate (LFPR) is a key economic indicator defined as the percentage of the population that is either employed or actively seeking employment within a specific age group, typically 15 years and above.

• According to the Periodic Labour Force Survey (PLFS) estimates released by the Ministry of Statistics and Programme Implementation (MoSPI), the female LFPR in India has witnessed a consistent upward trend, rising from 23.3% in 2017-18 to significant heights in recent years.

• In the specific period of October 2025, the female LFPR reached a level of 34.2%, reflecting the positive impact of socio-economic interventions and increased female literacy rates across both Rural and Urban sectors.

• This growth is largely attributed to the expansion of Self-Help Groups (SHGs) under the National Rural Livelihood Mission (NRLM) and specialized credit schemes like the Mudra Yojana, which have facilitated higher economic agency for women.

• The 34.2% figure represents a crucial milestone in reducing the gender gap in the Indian workforce, indicating a more inclusive labor market structure by the end of the 2025 calendar year.

• Therefore, the correct option is 4.

Additional Information

• Labour Force Participation Rate (LFPR):

• It is calculated as (Labour Force / Total Population) × 100 for the relevant age bracket.

• The labour force includes both the Employed and the Unemployed (those seeking/available for work).

• Periodic Labour Force Survey (PLFS):

• Launched by the National Sample Survey Office (NSSO) in April 2017 to provide more frequent labor market data.

• It uses two primary metrics: Usual Status (ps+ss) for a one-year reference and Current Weekly Status (CWS) for a seven-day reference.

• Related Indicators:

• Worker Population Ratio (WPR): The percentage of employed persons in the total population.

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• Unemployment Rate (UR): The percentage of persons unemployed among the persons in the labour force.

Q44. Answer: (a) 2030

The correct answer is 2030.

Key Points

• In December 2025, Union Minister for Coal and Mines G. Kishan Reddy reaffirmed the national objective under the National Coal Gasification Mission to achieve the gasification of 100 million tonnes (MT) of coal.

• The mission is strategically designed to be completed by the target year 2030, aiming to utilize India\'s vast domestic coal reserves for cleaner and more diverse industrial applications.

• Coal gasification is a thermochemical process that converts coal into syngas (synthetic gas), a mixture primarily consisting of hydrogen, carbon monoxide, and carbon dioxide.

• The syngas produced through this mission will serve as a critical feedstock for the production of chemicals, fertilizers (such as urea and ammonia), methanol, and cleaner fuels, thereby supporting the vision of Atmanirbhar Bharat.

• By shifting from direct combustion to gasification, the government aims to reduce environmental impact and enhance energy security by decreasing the country\'s heavy reliance on imported natural gas and crude oil.

Additional Information

• Incentive Framework and Financial Support:

• The Union Cabinet has approved a comprehensive incentive scheme with a financial outlay of approximately Rs 46,000 crore (including a specific Rs 8,500 crore component) to promote Surface Coal/Lignite Gasification projects.

• This financial support is divided into categories for Government PSUs and the Private Sector, offering Viability Gap Funding (VGF) to ensure project feasibility.

• India currently holds the fifth-largest coal reserves globally, estimated at nearly 400 billion tonnes, making coal a sustainable long-term resource for gasification technologies.

• Significant projects, such as the Coal-to-Ammonium Nitrate Project in Odisha (a joint venture between Coal India Limited and BHEL), are already under execution to meet the 2030 target.

Q45. Answer: (a) Ishwar Chandra Vidyasagar

The correct answer is Ishwar Chandra Vidyasagar.

Key Points

• Ishwar Chandra Vidyasagar was a legendary 19th-century polymath and social reformer from Bengal who is primarily remembered as the champion of women's rights and education.

• He served as the Principal of Sanskrit College in Calcutta, where he used his profound knowledge of ancient texts to challenge the orthodox refusal to allow widows to remarry.

• Vidyasagar produced a seminal work titled 'Marriage of Hindu Widows', where he cited the Parashara Smriti to argue that the Shastras sanctioned remarriage for widows under specific circumstances.

• His relentless petitioning and public campaigning led to the legal recognition of such marriages through the Hindu Widows' Remarriage Act, 1856 (also known as Act XV).

• This landmark legislation was enacted on July 26, 1856, during the tenure of Governor-General Lord Canning, though it was drafted by Lord Dalhousie.

• To prove his conviction, he performed the first legal widow remarriage in Calcutta in December 1856 and even encouraged his own son, Narayan Chandra, to marry a widow.

Additional Information

• Jyotiba Phule:

• A radical social reformer in Maharashtra who founded the Satyashodhak Samaj in 1873 to advocate for the rights of Shudras and Ati-Shudras.

• He established the Balhatya Pratibandhak Griha to prevent infanticide and provide shelter to pregnant widows.

• Bal Gangadhar Tilak:

• A prominent nationalist known as Lokmanya who played a major role in the Indian Independence Movement through the Home Rule League.

• He utilized the newspapers Kesari and The Mahratta to spread the message of Swaraj.

• Swami Vivekananda:

• A key figure in the introduction of Indian Vedantic philosophy to the Western world, he established the Ramakrishna Mission in 1897.

• He gained international fame following his address at the Parliament of the World's Religions in Chicago in 1893.

Q46. Answer: (d) Varahamihira

The correct answer is Varahamihira.

Key Points

• Varahamihira was a distinguished Indian astronomer, mathematician, and astrologer who lived in Ujjain during the 6th century CE, under the patronage of the Gupta Empire.

• The Panchasiddhantika is his most famous astronomical work, which serves as a compendium of five earlier astronomical systems known as Siddhantas.

• The five astronomical canons summarized in this text are the Paitamaha, Vashistha, Romaka, Paulisa, and Surya Siddhantas.

• Among these five, Varahamihira considered the Surya Siddhanta to be the most accurate and scientifically advanced system of the time.

• His work is a vital historical source because it preserves mathematical methods and concepts from earlier eras that would have otherwise been lost to history.

Additional Information

• Aryabhata:

• He was a pioneering 5th-century mathematician-astronomer who authored the Aryabhatiya.

• He famously proposed that the Earth is spherical and rotates on its axis, explaining the causes of solar and lunar eclipses.

• Brahmagupta:

• An 7th-century mathematician who wrote the Brahmasphutasiddhanta.

• He is credited with providing the first clear rules for using zero as a number and solving quadratic equations.

• Kalidasa:

• The most celebrated classical Sanskrit poet and playwright, often referred to as the Shakespeare of India.

• His literary masterpieces include Abhijnanashakuntalam, Meghaduta, and Kumarasambhava.

• Brihat Samhita:

• Another monumental work by Varahamihira, which is an encyclopedic treatise covering diverse topics like architecture, botany, planetary movements, and natural history.

Q47. Answer: (b) Taskbar

The correct answer is Taskbar.

Key Points

• The Taskbar is a long horizontal bar typically located at the bottom of the screen in the Windows Operating System.

• Its primary function is to show open applications, allowing users to switch between active programs quickly by clicking on their respective icons.

• It serves as a multitasking hub, where active windows are represented by buttons or icons that can be minimized or restored.

• The taskbar includes the Start button on the left side, which provides access to apps, settings, and files, and the Notification Area (system tray) on the right side for system icons like volume, network, and the clock.

• Users can pin frequently used applications to the taskbar for one-click access, ensuring they remain visible even when the program is closed.

Additional Information

• Title bar:

• Located at the topmost part of an application window.

• Displays the name of the file or the software application currently in use.

• Contains control buttons such as Minimize, Maximize/Restore, and Close.

• Menu bar:

• A horizontal strip typically found just below the title bar.

• Contains a series of drop-down menus like File, Edit, View, and Help, providing access to various software commands.

• Scroll bar:

• Appears at the right side or bottom of a window when the content exceeds the visible area.

• Used for vertical or horizontal navigation to view hidden parts of a document or webpage.

Q48. Answer: (a) It is uninhabited and has a bird sanctuary

The correct answer is It is uninhabited and has a bird sanctuary.

Key Points

• Pitti Island, also known as Pakshipitti, is a small, uninhabited coral island located in the Lakshadweep archipelago in the Arabian Sea.

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• The island is primarily famous for its status as a Bird Sanctuary, which was officially designated to protect the numerous avian species that use the site for nesting.

• It serves as a critical breeding ground for pelagic birds such as the Sooty Tern, the Greater Crested Tern, and the Brown Noddy.

• Since there are no human settlements on the island, the avian population thrives without the pressure of urban development or agricultural activities.

• It is situated approximately 24 kilometers north of Kavaratti, which is the administrative capital of the Union Territory of Lakshadweep.

Additional Information

• Lakshadweep Islands:

• The archipelago consists of 36 islands, but only 10 are currently inhabited by humans.

• These islands are categorized as atolls and are entirely of coral origin.

• The name Lakshadweep literally translates to 'a hundred thousand islands' in Sanskrit and Malayalam.

• Contextual Clarifications:

• Active Volcanoes: India’s only active volcano is found on Barren Island, which is part of the Andaman and Nicobar chain, not Lakshadweep.

• Andaman Sea: This sea body is located to the east of the Andaman and Nicobar Islands; Lakshadweep is situated on the opposite side of the Indian peninsula in the Arabian Sea.

• Military Presence: While the Indian Navy maintains a presence in the region (e.g., INS Jatayu on Minicoy), the largest military bases are typically located on the mainland or in the Andaman region (Cincan).

Q49. Answer: (d) Surat

The correct answer is Surat.

Key Points

• The Surat Session of the Indian National Congress (INC) held in December 1907 is famously known as the Surat Split, where the organization divided into two wings: the Moderates and the Extremists.

• The immediate bone of contention was the choice of the President for the session; the Extremists wanted Lala Lajpat Rai or Bal Gangadhar Tilak to lead, while the Moderates favored Rash Behari Ghosh, who eventually presided over the meeting.

• Ideological rifts had deepened since the 1905 Partition of Bengal, as the Extremists advocated for a pan-India Boycott and Passive Resistance, whereas the Moderates preferred constitutional methods and petitions.

• The conflict escalated over the four resolutions passed at the 1906 Calcutta Session regarding Swadeshi, Boycott, National Education, and Self-Government, which the Moderates sought to dilute or restrict to Bengal.

• The session ended in chaos and physical skirmishes, leading to the Extremists being expelled from the Congress; they remained outside the party until the Lucknow Pact of 1916.

Additional Information

• Bombay:

• The first session of the Indian National Congress was held here in December 1885 at Gokuldas Tejpal Sanskrit College.

• It was presided over by Womesh Chandra Bonnerjee and attended by 72 delegates.

• Calcutta:

• The 1906 session, presided over by Dadabhai Naoroji, was critical as the word Swaraj (Self-government) was first used from the Congress platform.

• It served as a temporary truce between the Moderates and Extremists before the final split.

• Lahore:

• The 1929 Lahore Session, presided over by Jawaharlal Nehru, is landmark for passing the Purna Swaraj (Complete Independence) resolution.

• It was decided during this session to observe January 26 as Independence Day across India.

• Key Ideologies:

• Moderates: Led by Gopal Krishna Gokhale and Pherozeshah Mehta, they believed in the policy of 3Ps: Prayer, Petition, and Protest.

• Extremists: Led by the Lal-Bal-Pal trio, they emphasized self-reliance and mass mobilization to achieve Swaraj.

Q50. Answer: (d) 100

The correct answer is 100.

Key Points

• The Union Budget 2025-26 introduced the Prime Minister Dhan-Dhaanya Krishi Yojana (PM-DDKY), also known as the Developing Agri Districts Programme, to foster holistic growth in the primary sector.

• The programme is designed to be initially implemented in 100 selected districts across the country, focusing on building comprehensive agricultural value chains.

• The selection of these 100 districts follows a criteria based on their current agricultural output, availability of irrigation resources, and potential for diversification into high-value crops.

• This initiative aims to transform these districts into Self-Reliant Agri-Hubs by integrating modern technology, logistics, and market connectivity.

• The scheme focuses on a cluster-based approach, ensuring that each of the 100 districts identifies and promotes specific crops that have a competitive advantage in domestic and global markets.

Additional Information

• Prime Minister Dhan-Dhaanya Krishi Yojana (PM-DDKY):

• The scheme includes the creation of Digital Public Infrastructure (DPI) for agriculture to provide farmers with real-time data on soil health, weather patterns, and crop prices.

• It encourages the formation of Farmer Producer Organizations (FPOs) within the 100 districts to enhance the collective bargaining power of small-scale cultivators.

• Post-harvest infrastructure, such as multi-purpose cold storages and grading units, is a central pillar of the programme to reduce wastage.

• The yojana is aligned with the broader goal of Atmanirbhar Krishi, seeking to make Indian agriculture more resilient and profitable through structural reforms.

• It also emphasizes sustainable practices, promoting natural farming and efficient water management through micro-irrigation systems in the target districts.

Q51. Answer: (b) Approved by both Houses of Parliament within Two months

The correct answer is Approved by both Houses of Parliament within Two months.

Key Points

• Under Article 360 of the Indian Constitution, the President is authorized to proclaim a Financial Emergency if a situation has arisen whereby the financial stability or credit of India or any part of its territory is threatened.

• A proclamation declaring Financial Emergency must be approved by both the Lok Sabha and the Rajya Sabha within a maximum period of two months from the date of its issue.

• The resolution for approval must be passed by either House of Parliament by a simple majority, which is a majority of the members of that House present and voting.

• If the Lok Sabha is dissolved or its dissolution takes place during the two-month period without approving the proclamation, the proclamation survives until 30 days from the first sitting of the Lok Sabha after its reconstitution, provided the Rajya Sabha has approved it in the meantime.

• Once approved by both Houses, the Financial Emergency continues indefinitely until it is revoked by the President, as there is no maximum period prescribed for its operation and no requirement for repeated parliamentary approval.

Additional Information

• Other Emergency Provisions:

• National Emergency (Article 352): This must be approved by the Parliament within one month from the date of its issue and requires a special majority for approval.

• President Rule (Article 356): Similar to the Financial Emergency, it must be approved by the Parliament within two months from the date of its issue but is initially valid for only six months.

• Historical Context:

• Although India faced a severe economic crisis in 1991, a Financial Emergency has never been declared in the country to date.

• During such an emergency, the President can issue directions for the reduction of salaries and allowances of all or any class of persons serving the Union or a State, including the judges of the Supreme Court and High Courts.

Q52. Answer: (d) Justice, Liberty, Equality, Fraternity

The correct answer is Justice, Liberty, Equality, Fraternity.

Key Points

• The Preamble serves as the introductory statement of the Constitution of India, setting out the guiding purpose and principles of the document.

• Justice is the first objective mentioned, encompassing social, economic, and political justice to ensure a fair society where no citizen is discriminated against.

• Liberty ensures the freedom of thought, expression, belief, faith, and worship, which are vital for the individual growth and the functioning of a democracy.

• Equality provides for equality of status and opportunity, aiming to eliminate disparities based on religion, race, caste, or sex.

• Fraternity promotes a sense of common brotherhood among all Indians, transcending communal or sectional diversities to uphold the dignity of the individual and national integrity.

Additional Information

• The Preamble is based on the Objective Resolution, which was moved by Jawaharlal Nehru on December 13, 1946, and adopted by the Constituent Assembly.

• It has been amended only once by the 42nd Constitutional Amendment Act, 1976, which added three new words: Socialist, Secular, and Integrity.

• Analysis of Incorrect Options:

• Monarchy: India is a Sovereign Democratic Republic; the inclusion of Monarchy is factually incorrect as India has an elected head of state.

• Rights and Duties: While Fundamental Rights (Part III) and Fundamental Duties (Part IV-A) are core parts of the Constitution, they are not the four specific objectives explicitly listed as a set in the Preamble.

• Parliament and Judiciary: These refer to the organs of government rather than the philosophical objectives or pillars of the Indian state.

• The Supreme Court in the Kesavananda Bharati case (1973) held that the Preamble is an integral part of the Constitution and can be amended under Article 368, provided the Basic Structure is not altered.

Q53. Answer: (a) 1947

The correct answer is 1947.

Key Points

• The General Agreement on Tariffs and Trade (GATT) was a multilateral agreement regulating international trade, signed on October 30, 1947.

• The signing ceremony took place in Geneva, Switzerland, involving 23 nations that sought to prevent the protectionist policies that characterized the pre-war era.

• Founding members included major economies such as the United States, India, the United Kingdom, Canada, and France, representing about 80 percent of world trade at the time.

• The primary objective of the 1947 agreement was the substantial reduction of tariffs and other trade barriers and the elimination of preferences on a reciprocal and mutually advantageous basis.

• Although signed in 1947, the agreement officially became effective on January 1, 1948, under a Protocol of Provisional Application.

Additional Information

• The World Trade Organization (WTO):

• The WTO replaced GATT on January 1, 1995, following the conclusion of the Uruguay Round of trade negotiations which lasted from 1986 to 1994.

• Unlike GATT, which was a series of agreements, the WTO is a permanent international organization with a more robust Dispute Settlement Body.

• The Bretton Woods Conference:

• Held in July 1944, this conference led to the creation of the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD).

• While the Havana Charter for an International Trade Organization (ITO) was drafted in 1948, it was never ratified by the U.S. Congress, leaving GATT as the sole framework for global trade for nearly 50 years.

• Evolution of Trade Rounds:

• GATT evolved through eight different rounds of negotiations, including the Kennedy Round, Tokyo Round, and finally the Uruguay Round, expanding from tariff reductions to intellectual property and services.

Q54. Answer: (d) Intermontane plateau

The correct answer is Intermontane plateau.

Key Points

• An intermontane plateau is a high-altitude landform that is completely or partially enclosed by mountain ranges. The term is derived from the Latin word inter (between) and mons (mountain).

• These plateaus are typically formed during orogenic movements (mountain-building processes) when the land between rising fold mountains is also uplifted, remaining relatively level compared to the peaks.

• The Tibetan Plateau is the most prominent example globally, often called the Roof of the World, as it is surrounded by the Himalayas to the south and the Kunlun Mountains to the north.

• Other notable examples include the Altiplano (Bolivian Plateau) situated between the eastern and western ranges of the Andes, and the Plateau of Anatolia in Turkey, located between the Pontic and Taurus mountains.

Additional Information

• Lava Plateau:

• Formed by fissure eruptions where highly fluid basaltic lava flows out and spreads over a large area before solidifying.

• Major examples include the Deccan Traps in India and the Columbia-Snake Plateau in the United States.

• Piedmont Plateau:

• Characterized by being situated at the foot of a mountain range.

• It is bordered by mountains on one side and a plain or an ocean on the other, such as the Piedmont Plateau of the eastern USA and the Malwa Plateau in India.

• Dissected Plateau:

• An upwardly elevated area that has been severely eroded by rivers, glaciers, or wind, creating a rugged terrain with deep valleys.

• While the surface appears mountainous, the horizontal rock strata indicate its plateau origin, such as the Catskill Mountains or the Scottish Highlands.

Q55. Answer: (c) United States

The correct answer is United States.

Key Points

• The United States Department of State is responsible for publishing the annual Country Reports on Human Rights Practices, which assesses the human rights situation in nearly 200 countries and territories.

• In August 2025, the international non-governmental organization Human Rights Watch (HRW) issued a formal critique regarding the methodology and content of these reports, specifically targeting the United States government.

• The criticism focused on the deliberate omission or significant reduction of reporting on the rights of LGBT people, a demographic that frequently faces systemic discrimination and violence globally.

• Human Rights Watch also highlighted that the report failed to provide adequate coverage for persons with disabilities, violating the spirit of the Convention on the Rights of Persons with Disabilities.

• Another critical area of omission noted was the freedom of assembly, which HRW argued is essential for civil society to hold governments accountable and is a fundamental right under the Universal Declaration of Human Rights.

• Advocacy groups expressed concern that such omissions by the United States could weaken global human rights standards and provide cover for authoritarian regimes to ignore these specific categories in their own jurisdictions.

Additional Information

• Human Rights Watch (HRW)

• Established in 1978, it is an international NGO headquartered in New York City that conducts research and advocacy on human rights.

• It was originally known as Helsinki Watch, created to monitor the Soviet Union's compliance with the Helsinki Accords.

• U.S. Department of State Human Rights Report

• This report is mandated by the Foreign Assistance Act of 1961 and the Trade Act of 1974.

• It is submitted annually to the U.S. Congress to inform legislative and executive decisions regarding foreign aid and diplomatic relations.

• The report typically covers civil, political, and worker rights, but its scope can vary based on the executive branch's policy priorities.

• Freedom of Assembly and Association

• Recognized as a fundamental human right that allows individuals to gather and collectively express, promote, pursue, and defend their collective ideas.

• It is protected under International Covenant on Civil and Political Rights (ICCPR), to which the United States is a party.

Q56. Answer: (c) Differential heating of land and sea

The correct answer is Differential heating of land and sea.

Key Points

• The primary driver for the initiation of the Indian Summer Monsoon is the difference in specific heat capacity between land and water; land heats up much faster than the ocean during the summer.

• During the months of April to June, the vast landmass of the Indian subcontinent, particularly Northwest India and the high-altitude Tibetan Plateau, undergoes intense heating.

• This intense thermal energy causes the air above the land to rise, creating a significant low-pressure area (thermal low) over the continental interior.

• In contrast, the surrounding Indian Ocean and the Arabian Sea remain relatively cooler, maintaining a higher atmospheric

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pressure compared to the land.

• This setup establishes a strong pressure gradient, forcing moisture-laden winds to blow from the high-pressure oceanic regions toward the low-pressure continental regions.

• As these winds cross the Equator, they are deflected by the Coriolis force, becoming the Southwest Monsoon winds that bring heavy seasonal rainfall to the region.

Additional Information

• Presence of the Himalayas

• The Himalayas act as a critical physical barrier that prevents the cold winds from Central Asia from entering the subcontinent.

• They also force the moisture-bearing monsoon winds to rise, resulting in orographic rainfall and ensuring the moisture is trapped within the Indian region.

• Coriolis Force

• This is a force caused by the Earth's rotation that deflects moving objects to the right in the Northern Hemisphere.

• It is essential for changing the direction of the Southeast Trade Winds into the Southwest Monsoon after they cross the equator.

• Inter Tropical Convergence Zone (ITCZ)

• The ITCZ is a low-pressure trough where trade winds converge; its northward shift to the Ganga plains during summer is a direct result of differential heating.

Q57. Answer: (b) To promote literature in Indian languages

The correct answer is To promote literature in Indian languages.

Key Points

• The Sahitya Akademi, formally inaugurated on March 12, 1954, is India's National Academy of Letters and functions as the apex body for literary promotion in the country.

• Its primary function is to promote literature in Indian languages by maintaining high literary standards, fostering coordination between literary associations, and encouraging creative writing across linguistic boundaries.

• The Akademi currently recognizes 24 languages, which include the 22 languages listed in the Eighth Schedule of the Constitution of India, along with English and Rajasthani.

• It serves as an autonomous organization under the Ministry of Culture, aiming to strengthen cultural unity by facilitating literary dialogue and making the literature of one language available to readers of other languages.

Additional Information

• Sahitya Akademi Award:

• Established in 1954, this annual award is one of the highest literary honors in India, given to authors of outstanding books published in any of the 24 recognized languages.

• Translation Services:

• While the Akademi does provide translation services and publishes translated works, this is a sub-function intended to achieve the broader goal of literary promotion and inter-linguistic understanding.

• Classical Languages:

• The Akademi promotes literature in all recognized languages, including those with classical status (such as Sanskrit, Tamil, and Telugu), but its mandate is not limited to classical languages alone.

• Administrative Hub:

• It is headquartered at Rabindra Bhavan in New Delhi and organizes the annual Festival of Letters, which is one of India's most significant literary gatherings.

Q58. Answer: (a) Manipuri

The correct answer is Manipuri.

Key Points

• Elam Endira Devi is a distinguished veteran dancer, teacher, and choreographer of the Manipuri classical dance form, which is one of the eight primary Indian classical dances.

• She was honored with the Padma Shri, the fourth-highest civilian award in India, in 2014 by the Government of India for her exceptional contributions to the field of Art.

• In 1993, she founded the Meitei Traditional Dance Teaching School and Performing Centre in Imphal, Manipur, which serves as a premier institution for preserving and promoting the traditional Jagoi and Meitei dance heritage.

• Devi is recognized for her mastery in Lai Haraoba, a traditional ritualistic dance festival of Manipur, and has extensively worked on the preservation of the Meitei cultural identity through dance.

• She has served as a member of the General Council of the Sangeet Natak Akademi and the Eastern Zonal Cultural Centre (EZCC), playing a vital role in cultural policy and education.

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• Her academic contributions include the publication of books and research papers on Manipuri dance, and she was recently selected for the Sangeet Natak Akademi Award for the year 2023 for her excellence in Manipuri dance.

Additional Information

• Kathak:

• Originating in Uttar Pradesh, North India, it is characterized by rhythmic footwork (Tatkar), lightning-fast pirouettes (Chakkars), and the use of Ghungroos (bells).

• The dance traditionally tells stories from the Ramayana and Mahabharata and is divided into major schools or Gharanas such as Lucknow, Jaipur, and Banaras.

• Odissi:

• A classical dance form from the state of Odisha, it is known for the Tribhanga posture, where the body is bent at the knees, waist, and neck.

• It is traditionally performed in the temples of Odisha, such as the Jagannath Temple in Puri, and features soft, lyrical movements.

• Bharatanatyam:

• Hailing from Tamil Nadu, it is one of the oldest classical dance traditions in India, originally performed by Devadasis in temples.

• It emphasizes a rigorous technical structure involving Nritta (pure dance), Nritya (expressive dance), and Abhinaya (facial expressions).

Q59. Answer: (c) Crystallization

The correct answer is Crystallization.

Key Points

• Crystallization is a chemical solid-liquid separation technique that results in the formation of solid particles from a homogeneous solution. It is widely used in the purification of substances like sugar and salt.

• In the sugar industry, after the sugarcane juice is clarified, it is evaporated to form a thick, concentrated liquid known as syrup or meladura.

• The syrup is heated in vacuum pans to achieve a state of supersaturation, where the amount of dissolved sucrose exceeds its normal solubility limit at that temperature.

• The growth of sugar crystals is often initiated by a technique called seeding, where a small amount of fine sugar is added to the supersaturated syrup to act as a nucleus for crystal growth.

• As the mixture cools or continues to evaporate, sucrose molecules arrange themselves in a highly ordered, three-dimensional crystalline lattice, effectively separating the pure sugar from the remaining liquid residue known as molasses.

• This method is preferred for sugar because it avoids the caramelization (burning) of sugar that would occur if the solution were simply heated to total dryness.

Additional Information

• Distillation

• A separation process based on differences in the boiling points of the components in a liquid mixture.

• It involves heating a liquid to create vapor and then cooling the vapor to get the liquid back, commonly used in petroleum refining and making distilled water.

• Chromatography

• A technique used to separate the components of a mixture based on their different rates of movement through a stationary phase while being carried by a mobile phase.

• It is vital in forensic science for identifying toxins and in labs for separating complex biological molecules like DNA or proteins.

• Filtration

• A physical or mechanical process used to separate solid particles from a fluid (liquid or gas) by passing it through a porous medium.

• In sugar production, it is used during the clarification stage to remove insoluble impurities or lime mud from the raw juice.

Q60. Answer: (d) Early stage of demographic transition

The correct answer is Early stage of demographic transition.

Key Points

• The Demographic Transition Model (DTM) illustrates how populations change over time as a country develops from an agrarian society to an industrial one.

• The early stage, specifically Stage 1 (High Stationary), is defined by both a high birth rate and a high death rate, resulting in a stable but low total population.

• High birth rates in this phase are typically the result of a lack of family planning, high infant mortality, and the social or economic need for large families to support subsistence agriculture.

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• High death rates are caused by poor sanitation, lack of clean water, frequent famines, and the widespread prevalence of infectious diseases due to minimal medical technology.

• In this stage, the natural increase of the population is very low because the high frequency of deaths effectively cancels out the high frequency of births.

• Historically, most of the world was in this stage prior to the Industrial Revolution, where life expectancy was low and population growth was stagnant.

Additional Information

• Post-industrial society

• Refers to Stage 4 or Stage 5 of the demographic transition where both birth and death rates are low, leading to a stable or even declining population.

• Characterized by high levels of urbanization, advanced technology, and a service-based economy.

• Advanced economy

• Associated with countries that have high GDP per capita, sophisticated healthcare infrastructure, and high literacy rates.

• Such economies typically experience low birth rates due to increased female participation in the workforce and access to healthcare.

• Dependency ratio

• A high birth rate actually leads to a high dependency ratio, specifically a high youth dependency, as a large portion of the population consists of children who rely on the working-age group.

• A low dependency ratio usually occurs during the middle stages of transition (the demographic dividend) when the working-age population is at its peak relative to children and the elderly.

Q61. Answer: (b) Kilogram per metre cubed

The correct answer is kg per metre cubed.

Key Points

• Density is defined as the mass of a substance per unit volume, representing how much matter is packed into a specific space.

• The dimensional formula for density is derived from the formula Density (ρ) = Mass (m) / Volume (V).

• In dimensional analysis, the dimension for mass is [M] and the dimension for volume is [L^3] (since volume is length × width × height). This results in the dimensional formula [ML^(−3)].

• According to the International System of Units (SI), the base unit for measuring mass is the kilogram (kg).

• The SI base unit for length is the metre (m); consequently, the derived SI unit for volume is the cubic metre (m^3).

• Combining these SI base units according to the dimensional formula [ML^(−3)] yields kg/m^3, which is expressed as kg per metre cubed.

Additional Information

• Analysis of Other Units:

• Litre (L): While units like kg per litre and g per litre are used in practical chemistry, the litre is not an SI base unit. One litre is equivalent to 0.001 cubic metres (1 dm^3).

• Gram (g) and Milligram (mg): These are metric sub-multiples of the kilogram. The gram is the base unit of mass in the CGS system, but not the primary SI base unit.

• Centimetre (cm): This is a sub-multiple of the metre used in the CGS system. A cubic centimetre (cm^3 or cc) is equal to 10^(−6) m^3.

• Physical Constants:

• The density of pure water at 4°C is standardly taken as 1000 kg/m^3 (or 1 g/cm^3).

• Osmium is the densest naturally occurring element, with a density of approximately 22590 kg/m^3.

Therefore, the correct option is 2.

Q62. Answer: (a) Hyderabad

The correct answer is Hyderabad.

Key Points

• The City-Level Action Plan (CLAP) for Children is a pioneering initiative developed by the Greater Hyderabad Municipal Corporation (GHMC) in technical collaboration with UNICEF (United Nations International Children's Emergency Fund).

• The primary objective of this strategic framework is to transform Hyderabad into a Child-Friendly City by mainstreaming children's rights into urban governance and infrastructure planning.

• The plan focuses on six key pillars: Survival, Development, Protection, Participation, Urban Environment, and Climate Change, ensuring a holistic approach to child welfare in an urban setting.

• Hyderabad holds the distinction of being the first million-plus population city in India to adopt such a comprehensive,

evidence-based action plan dedicated to children.

• The framework utilizes data-driven indicators to track the progress of basic services such as immunization, nutrition, quality education, and safe drinking water across all municipal circles.

Additional Information

• UNICEF (United Nations International Children's Emergency Fund):

• Acts as a technical partner to the Government of Telangana, providing expertise in social policy and child rights to achieve Sustainable Development Goals (SDGs) at the local level.

• Assists in creating Child-Friendly Urban Spaces that include safe school zones, inclusive playgrounds, and accessible healthcare for vulnerable children in urban slums.

• Greater Hyderabad Municipal Corporation (GHMC):

• The executive body responsible for implementing the CLAP strategies through inter-departmental coordination between health, education, and town planning wings.

• It aims to institutionalize Child Participation by involving adolescents in the decision-making processes of urban development to better address their specific safety and developmental needs.

Q63. Answer: (a) Tunisia

The correct answer is Tunisia.

Key Points

• Semia Gharbi is a prominent environmental activist and researcher from Tunisia who was awarded the Goldman Environmental Prize (often referred to as the Green Nobel) for the Africa region.

• She was recognized for her pivotal role in leading a successful grassroots campaign to stop the illegal import of toxic household and medical waste from Italy into Tunisia.

• As the chairperson of the Association de l'Education Environnementale pour les Futures Générations (AEEFG), she utilized environmental diplomacy and legal advocacy to highlight violations of the Basel Convention.

• Her efforts resulted in a historic victory in February 2022, when the Tunisian government was forced to repatriate 282 containers of illegal waste back to Italy, setting a major precedent for environmental justice in the Global South.

• Gharbi is also a key member of the International Pollutants Elimination Network (IPEN), where she works to eliminate hazardous chemicals and persistent organic pollutants globally.

Additional Information

• Goldman Environmental Prize:

• Founded in 1989 by Richard and Rhoda Goldman, the prize honors grassroots environmental heroes from six geographic regions: Africa, Asia, Europe, Islands and Island Nations, North America, and South and Central America.

• The award includes a financial grant to support the winners' ongoing environmental protection efforts.

• Environmental Context:

• Tunisia: A North African nation that has become a leader in the region for advocating against the dumping of European waste on African soil.

• Basel Convention: An international treaty designed to reduce the movement of hazardous waste between nations, particularly from developed to less developed countries.

Q64. Answer: (d) Emergence of a complex varna hierarchy

The correct answer is Emergence of a complex varna hierarchy.

Key Points

• During the Early Vedic period (c. 1500−1000 BCE), society was primarily pastoral and semi-nomadic, with a social structure based on kinship and tribal loyalty where the varna system was fluid and not strictly hereditary.

• The transition to the Later Vedic period (c. 1000−600 BCE) was marked by a shift toward sedentary agriculture and the expansion of settlements into the Ganga-Yamuna Doab region.

• This period saw the crystallization of the four-fold Varna system, comprising Brahmanas (priests), Kshatriyas (warriors/rulers), Vaishyas (agriculturists/traders), and Shudras (laborers).

• Social status became increasingly hereditary, creating a rigid hierarchy where the upper two varnas enjoyed privileges and divine sanction, while the Shudras were relegated to a life of service to the other three.

• The emergence of this complex social stratification is the most defining sociological change, as it replaced the relatively egalitarian tribal assemblies like the Sabha and Samiti with a system centered on status and birth.

Additional Information

• Technological and Economic Evolution:

• The discovery and widespread use of iron (referred to as Shyama Ayas or Krishna Ayas) allowed for the clearing of dense forests and deep plowing, leading to surplus food production.

• This economic surplus provided the foundation for the Janapadas (territorial states) and a more specialized division of labor.

• Religious Transitions:

• Rituals and sacrifices (Yajnas) like Ashvamedha, Rajasuya, and Vajapeya became extremely elaborate and central to validating the king's authority.

• The simplistic nature worship of the Rig Vedic era gave way to the worship of newer deities like Prajapati (the Creator), Vishnu (the Preserver), and Rudra (the Destroyer).

• Political Centralization:

• The Rajan (king), who was earlier a tribal chief (Gopa), transformed into a powerful monarch with a growing administrative machinery consisting of officials like the Sangrihitri (treasurer).

Q65. Answer: (b) Rs. 2,000 crore

The correct answer is Rs. 2,000 crore.

Key Points

• The Government of India established the Rural Infrastructure Development Fund (RIDF) in the Union Budget of 1995-96 to address the lack of funds for completing ongoing rural infrastructure projects.

• The fund was launched with an initial corpus of Rs. 2,000 crore, which is technically referred to as RIDF I, and was placed under the management of the National Bank for Agriculture and Rural Development (NABARD).

• The main objective of creating this fund was to provide low-cost financial support to State Governments and State-owned corporations for the quick completion of projects related to medium and minor irrigation, soil conservation, and watershed management.

• The mechanism for funding the RIDF involves contributions from Scheduled Commercial Banks operating in India; these banks contribute an amount equivalent to their shortfall in achieving Priority Sector Lending (PSL) targets specifically towards the agriculture sector.

• Over the decades, the corpus of the RIDF has been replenished annually through successive Union Budgets, with the total allocation growing exponentially to support a wider array of rural development activities.

Additional Information

• NABARD (National Bank for Agriculture and Rural Development):

• It was established on July 12, 1982, based on the recommendations of the B. Sivaraman Committee to implement the National Bank for Agriculture and Rural Development Act, 1981.

• Headquartered in Mumbai, it serves as the apex regulatory body for the overall regulation and licensing of regional rural banks and apex cooperative banks in India.

• Scope of RIDF:

• Currently, the RIDF covers 39 eligible activities which are broadly classified into three categories: Agriculture and Related Sectors, Social Sectors (like drinking water and education), and Rural Connectivity (roads and bridges).

• The interest rates on RIDF loans are linked to the Bank Rate of the Reserve Bank of India (RBI), making it an affordable credit source for state-led infrastructure development.

Q66. Answer: (d) 91st Amendment

The correct answer is 91st Amendment.

Key Points

• The 91st Constitutional Amendment Act, 2003, was enacted to limit the size of the Council of Ministers and strengthen the Anti-Defection Law to prevent political instability.

• It inserted Article 75(1A) into the Constitution, which mandates that the total number of Ministers, including the Prime Minister, in the Central Council of Ministers shall not exceed 15% of the total strength of the Lok Sabha.

• The amendment also introduced Article 164(1A), stipulating that the number of Ministers in a State, including the Chief Minister, shall not exceed 15% of the total number of members of the Legislative Assembly of that State.

• For smaller States, the amendment ensured a minimum of 12 Ministers to maintain administrative efficiency regardless of the 15% ceiling.

• Furthermore, it amended the Tenth Schedule by removing the provision that protected a 'split' (where one-third of members leave a party), thereby making the anti-defection rules more stringent.

Additional Information

• 42nd Amendment (1976):

• Widely regarded as the 'Mini-Constitution', it brought massive changes during the Emergency, including adding Socialist, Secular, and Integrity to the Preamble.

• It introduced Fundamental Duties under Article 51A and shifted five subjects from the State List to the Concurrent List.

• 86th Amendment (2002):

• It established the Right to Education as a Fundamental Right by inserting Article 21A, making free education compulsory for children aged 6 to 14 years.

• It also added a new Fundamental Duty under Article 51A(k) for parents and guardians.

• 99th Amendment (2014):

• This amendment sought to establish the National Judicial Appointments Commission (NJAC) to replace the existing collegium system for appointing judges.

• In 2015, the Supreme Court of India struck down this amendment as unconstitutional, restoring the collegium system.

Q67. Answer: (a) System software typically has minimal direct interaction; applications are highly interactive.

The correct answer is System software typically has minimal direct interaction; applications are highly interactive..

Key Points

• System Software serves as the primary interface between the computer Hardware and the Application Software, managing internal operations such as Memory Management, Process Scheduling, and File Storage.

• The interaction model for System Software is largely Background-Oriented, meaning it performs its functions autonomously once the computer is booted, requiring minimal direct input from the user during standard operations.

• Application Software is specifically designed to perform End-User Tasks, such as word processing, data analysis, or web browsing, making it highly dependent on Direct User Engagement and continuous input-output cycles.

• While a user might interact with System Software occasionally for Configuration or Maintenance (e.g., updating drivers or partitioning a disk), the core purpose of Application Software is to provide a User-Centric Environment for active task execution.

• System Software provides the necessary platform and Application Programming Interfaces (APIs) that allow highly interactive applications to run smoothly without the user having to manage complex hardware instructions manually.

Additional Information

• System Software Components:

• Operating Systems (OS): Programs like Windows, macOS, and Linux that manage system resources and provide a user interface.

• Device Drivers: Specialized software that allows the OS to communicate with hardware peripherals like printers, GPUs, and network cards.

• Utility Programs: Software used for system maintenance, including Disk Defragmenters, Antivirus tools, and Backup utilities.

• Application Software Categories:

• Productivity Suites: Tools like Microsoft Office or Google Workspace used for creating documents and spreadsheets.

• Media Software: Applications such as VLC Media Player or Adobe Photoshop designed for content consumption and creation.

• Web Browsers: Highly interactive interfaces like Chrome or Firefox used to access the internet.

Therefore, the correct answer is System software typically has minimal direct interaction; applications are highly interactive.

Q68. Answer: (b) Aggressively pursuing global acquisitions and enhancing industrial growth

The correct answer is Aggressively pursuing global acquisitions and enhancing industrial growth.

Key Points

• The Economic Reforms of 1991, famously known as the LPG (Liberalization, Privatization, and Globalization) model, dismantled the restrictive License Raj, enabling the private sector to become the primary driver of industrial growth.

• The abolition of the Monopolies and Restrictive Trade Practices (MRTP) Act thresholds allowed Indian firms to expand their capacities and diversify into core sectors like infrastructure, telecommunications, and power.

• Since 1991, Indian private enterprises have evolved into Multinational Corporations (MNCs) by aggressively pursuing global acquisitions to secure new technologies, access international markets, and build global brand equity.

• The private sector has significantly contributed to the Gross Domestic Product (GDP) and Export Earnings, leveraging Foreign Direct Investment (FDI) and indigenous innovation to compete at a global scale.

• Technological advancement and increased efficiency in the private sector led to India becoming a global hub for Information Technology (IT) and Pharmaceuticals.

Additional Information

• Major Global Acquisitions:

• Tata Steel acquired the Anglo-Dutch company Corus in 2007 for approximately $12.1 billion, making it one of the largest overseas deals by an Indian company.

• Tata Motors acquired the premium British brands Jaguar and Land Rover (JLR) from Ford in 2008 for $2.3 billion.

• Hindalco Industries, part of the Aditya Birla Group, acquired the American aluminum giant Novelis in 2007.

• Bharti Airtel expanded its footprint into the African continent by acquiring Zain Africa in 2010.

• Industrial Policy 1991: This policy drastically reduced the number of industries reserved exclusively for the Public Sector from 17

to just 8 (now further reduced to atomic energy and railways), opening the path for private investment in core heavy industries.

• The shift from import substitution to export-oriented growth necessitated that the private sector upgrade its quality standards to meet international benchmarks.

Q69. Answer: (c) Part IXA and 12^(th) Schedule

The correct answer is Part IXA and 12^(th) Schedule.

Key Points

• The 74^(th) Constitutional Amendment Act of 1992 introduced provisions related to Urban Local Bodies (Municipalities) by inserting a new Part IXA into the Constitution of India.

• This Part, titled 'The Municipalities', consists of provisions spanning from Article 243-P to 243-ZG, providing a uniform framework for urban governance across the country.

• The same amendment also added the 12^(th) Schedule to the Constitution, which enumerates the functional responsibilities of the municipalities.

• The 12^(th) Schedule contains a list of 18 functional items, such as urban planning, public health, sanitation, fire services, and slum improvement, that fall under the jurisdiction of these bodies.

Additional Information

• Part IX and 11^(th) Schedule:

• These were added by the 73^(rd) Constitutional Amendment Act, 1992 to provide constitutional status to Panchayati Raj Institutions (Rural Local Government).

• The 11^(th) Schedule contains 29 functional items related to rural development, agriculture, and primary education.

• Types of Municipalities:

• The Act provides for three types of municipalities: Nagar Panchayats for transitional areas, Municipal Councils for smaller urban areas, and Municipal Corporations for larger urban areas.

• It also mandates the reservation of seats for Scheduled Castes, Scheduled Tribes, and women (not less than one-third of the total number of seats).

• The 74^(th) Amendment Act officially came into force on June 1, 1993.

Q70. Answer: (b) 990

The correct answer is 990.

Key Points

• The Sex Ratio is defined as the number of females per 1,000 males in a population, serving as a vital indicator of gender parity. According to the Census of India 2011, the sex ratio for the Scheduled Tribe (ST) population in India was recorded as 990.

• This figure represents a significant improvement compared to the 2001 Census, where the sex ratio for the Scheduled Tribes was recorded at 978.

• The sex ratio of Scheduled Tribes (990) is notably higher than the overall national average sex ratio of India, which was 943 in 2011.

• It is also considerably better than the sex ratio of the Scheduled Caste (SC) population, which stood at 945 during the same census period.

• Among the Indian states, Goa recorded the highest sex ratio for the Scheduled Tribe population at 1,046, while Jammu and Kashmir recorded the lowest at 924.

• In terms of Union Territories, Lakshadweep showed a robust ST sex ratio of 1,003, highlighting better gender balance in tribal-dominated island regions.

Additional Information

• Scheduled Tribes (ST) in India:

• The Scheduled Tribes are communities notified under Article 342 of the Indian Constitution, characterized by distinct cultures and geographical isolation.

• According to the 2011 Census, Scheduled Tribes constitute approximately 8.6% of the total population of India, numbering about 10.43 crore.

• The Child Sex Ratio (0-6 years) for the ST population in 2011 was 957, which is significantly higher than the national child sex ratio of 919.

• The state of Madhya Pradesh has the highest population of Scheduled Tribes in terms of absolute numbers, whereas Lakshadweep and Mizoram have the highest percentage of tribal population relative to their total population.

• The Census of India 2011 was the 15th National Census of the country and the 7th census conducted after Independence.

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Q71. Answer: (a) ADA−XAX

The logic follows here,

DGD − ADA

ILI − FIF

Applying same logic for ADA − XAX:

Hence, the correct answer is "option 1"

Q72. Answer: (b) AC – EG – IK

Logic followed here is:

Logic: The positional values of all the letters in the triad form an arithmetic progression with a common difference of 2. Each letter is obtained by adding 2 to the positional value of the previous letter.

For the triad DF − HJ − LN:

For the triad GI − KM − OQ:

Applying to the same logic,

The correct answer is AC − EG − IK.

Hence, the correct is "option 2".

Q73. Answer: (d) Two

Given number: 163742

Original Digit	1	6	3	7	4	2
Condition	+2	−1	+2	+2	−1	−1
New Digit	3	5	5	9	3	1

New Number = 3 5 5 9 3 1

Therefore, two digits appear more than once.

Hence, the correct answer is "Option B"

Q74. Answer: (b) Mother's mother

The family tree diagram is,

As shown in the family tree, X is the mother of T, and T is the mother of K. Therefore, X is the Mother's mother (maternal grandmother) of K.

Hence, the correct answer is 'Option 2'.

Q75. Answer: (c) ZCH

The logic follows here,

Hence, the correct answer is "option 3"

Q76. Answer: (d) 212

The family tree diagram is,

Signs Interchange:

Original Sign	New Sign
•	–
–	•
×	÷
÷	×

Given Equation:94 ÷ 5 + 262 − 24 × 6 = ?

After interchanging the signs,and applying BODMAS Rule the equation becomes:

= 94 × 5 − 262 + 24 ÷ 6

= 94 × 5 − 262 + 4

= 470 + 4 − 262

= 474 − 262

= 212

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The final value of the equation is 212.

Hence, the correct answer is "option 4"

Q77. Answer: (c) 7

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

Required Conditions: Consonant - Consonant - Consonant.

• R - C - X

• C - X - Z

• X - Z - H

• Z - H - M

• D - F - T

• F - T - B

• T - B - S

Hence, the correct answer is "option 3"

Q78. Answer: (a) Three

Given: Seven people, F, G, H, L, M, O, and Q, are sitting in a row facing north.

1. Only five people sit between G and O.

2. H sits to the immediate left of O.

3. Only one person sits between H and F.

4. Q sits immediately to the left of L

Final Seating Arrangement:

Three people sit between L and O.

Hence, the correct answer is "option 1"

Q79. Answer: (a) 13

The logic followed here is:

• Total number of people in the row = 165

• Position of Rt from the right end = 134^(th)

• Position of Kl from the left end = 18^(th)

Position of Rt from the left end = Total number of people − Position of Rt from the right end + 1

= 165 − 134 + 1

= 31 + 1

= 32

Number of people between Rt and Kl = Position of Rt from the left end − Position of Kl from the left end − 1

= 32 − 18 − 1

= 14 − 1

= 13

Hence, the correct answer is 'Option 1'.

Q80. Answer: (c) NOQ

The logic follows here,

Hence, the correct answer is "option 3"

Q81. Answer: (c) Both conclusions (I) and (II) follow

The least possible Venn diagram for the given statements is:

(I) No logs are ants - Follow (As their is no direct relaton establish between logs and ants may be it is possible but not definte)

(II) Some wings are ants - Follows (All ants are wings and some wings anre ants and some wings are ants)

Both conclusions (I) and (II) follow.

Hence, the correct answer is " Option 3"

Q82. Answer: (b) Two

Given: Seven people, H, I, J, K, W, Y, and Z, are sitting in a row facing north.

1. No one sits to the left of H.

2. Only four people sit between H and I.
3. Only three people sit to the right of W.
4. Z sits to the immediate left of J.
5. Y is not an immediate neighbor of W

The Final Arrangement is,

So, there are Two people sitting between Y and W.

Hence, the correct answer is "option 2"

Q83. Answer: (c) 109

The logic followed here is:

Rank of Pqr from the top = 39^(th)

Rank of Pqr from the bottom = 71^(st)

Total number of students in the class = Rank from the top + Rank from the bottom − 1

= 39 + 71 − 1

= 110 − 1

= 109

Hence, the correct answer is 'Option 3'.

Q84. Answer: (a) 19, 211

The logic followed here is:

Logic: Second Number = (First Number × 11) + 2

For the first set 18, 200

=> (18 × 11) + 2

=> 198 + 2 = 200.

For the second set 17, 189

=> (17 × 11) + 2

=> 187 + 2 = 189.

Applying the same logic to the options:

For Option 1: 19, 211

=> (19 × 11) + 2

=> 209 + 2 = 211.

Hence, the correct answer is 'Option 1'.

Q85. Answer: (c) TTV

The logic follows here,

KJM,

FEH,

TTV,

ZYB,

Therefore, the letter cluster that is different from the others is TTV.

Hence, the correct answer is 'Option 3'.

Q86. Answer: (c) BZV

The logic follows here,

EBY,

TQN,

BZV

FCZ,

Therefore, the letter cluster that is different from the others is BZV.

Hence, the correct answer is 'Option 3'.

Q87. Answer: (c) Brother

The family tree diagram is,

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Symbol	÷	#	•	&
Meaning	Son	Wife	Brother	Father

Given : S ÷ D # R & Y + H

Therefore, S, Y, and H are the children of D and R. Since S is a son, S is the Brother of H.

Hence, the correct answer is 'Option 3'.

Q88. Answer: (d) ABLE-EABL-LEAB

The logic followed in this pattern is a cyclic shift of letters, where the last letter of the word is moved to the first position to form the next word in the sequence.

For the triad 'BATH – HBAT – THBA':

B	A	T	H
↓ Last letter moves to first ↓			
H	B	A	T
↓ Last letter moves to first ↓			
T	H	B	A

For the triad 'TOYS – STOY – YSTO':

T	O	Y	S
↓ Last letter moves to first ↓			
S	T	O	Y
↓ Last letter moves to first ↓			
Y	S	T	O

Applying the same logic to the correct triad:

A	B	L	E
↓ Last letter moves to first ↓			
E	A	B	L
↓ Last letter moves to first ↓			
L	E	A	B

The sequence ABLE – EABL – LEAB follows the exact pattern of shifting the last character to the front.

Hence, the correct answer is 'Option 4'.

Q89. Answer: (b) Only conclusion (II) follows

The least possible Venn diagram for the given statements is:

(I) Some fishes are octopus - Don't follows

(There is no intersection between the fishes circle and the octopus circle. Since no definite relation is given, it does not follow.)

(II) Some watches are fishes - Follows

(Since some fishes are watches, there is a definite intersection between the two sets, which implies some watches are also fishes.)

Only conclusion (II) follows

Hence, the correct answer is "Option 2"

Q90. Answer: (a) 3

BODMAS Table:

According to the question, the signs are interchanged as follows:

• '+' and '−' are interchanged.

• '×' and '÷' are interchanged.

Given equation: 558 × 31 − 18 ÷ 17 + 321 = ?

After interchanging the signs, using the BODMAS rule the new equation is:
= 558 ÷ 31 + 18 × 17 − 321
= 18 + 18 × 17 − 321
= 18 + 306 − 321
= 324 − 321
= 3
Hence, the correct answer is "option 1"

Q91. Answer: (a) 8

The logic follows here,
Therefore, the code for B is 8.
Hence, the correct answer is "option 1"

Q92. Answer: (c) 141

The logic follows here,
• 111 + 3 = 114
• 114 + 6 = 120
• 120 + 9 = 129
• 129 + 12 = 141
• 141 + 15 = 156
Hence, the correct answer is "option 3"

Q93. Answer: (b) 210

The logic followed here is:
• 15 + 7 = 22
• 22 + 18 = 40
• 40 + 27 = 67
• 67 + 38 = 105
• 105 + 47 = 152
• 152 + 56 = 208
Thus, the missing term in the series is 210.
Hence, the correct answer is 'Option 2';

Q94. Answer: (c) JO-QU

The logic follows here,
HL-NR,
DH-JN,
JO-QU,
FJ-LP,
Therefore, the letter-cluster pair that is different from the others is JO-QU.
Hence, the correct answer is 'Option 3'.

Q95. Answer: (a) 1

The logic followed here is,

Original Position	S	E	R	V	A	N	T
Alphabetical Order	A	E	N	R	S	T	V

• Only the position of the letter E remains unchanged.
• Therefore, the total number of letters with unchanged positions is 1.
Hence, the correct answer is "option 1"

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Q96. Answer: (c) Two

Given series: (Left) 6 4 2 9 3 2 6 8 4 2 8 8 1 6 7 6 5 8 7 5 4 3 4 (Right)

Required Condition: Even digit, Odd digit, Odd digit.

(Left) 6 4 2 9 3 2 6 8 4 2 8 8 1 6 7 6 5 8 7 5 4 3 4 (Right)

So, the total count of such odd digits is Two.

Hence, the correct answer is 'Option 3'.

Q97. Answer: (a) oh

The logic follows here,

Therefore, the code for salad is oh.

Hence, the correct answer is "option 1"

Q98. Answer: (c) 95

The logic followed here is:

• Total number of people in the row = 145

• Position of Vks from the left end = 26^(th)

• Position of Ccd from the right end = 24^(th)

Number of people between Ccd and Vks = Total number of people − (Position of Vks from the left + Position of Ccd from the right)

= 145 − (26 + 24)

= 145 − 50

= 95

Hence, the correct answer is "Option 3"

Q99. Answer: (d) KAD

The logic followed here is,

The missing term in the series is KAD.

Hence, the correct answer is "option 4"

Q100. Answer: (b) 7 km to the west

The logic follows here,

1. Mr. Vasu starts from Point A and drives 25 km towards the north.
2. He then takes a left turn, drives 17 km, turns left and drives 9 km.
3. He then takes a right turn, drives 5 km, turns left and drives 20 km.
4. He then takes a left turn and drives 29 km.
5. He takes a final left turn, drives 4 km and stops at Point P

The Final Diagram,

7 km to the west.

Hence, the correct answer is "Option 2"

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