

RRB Group D Free Mock

Q1. A magnet, when moved near a coil, produces an induced current. Which of the following method(s) can be used to increase the magnitude of the induced current?

- (i) Increasing the number of turns in the coil
 - (ii) Increasing the speed of the magnet
 - (iii) Increasing the resistivity of the wire of the coil
- (a) Both (i) and (ii)
(b) Only (i)
(c) Only (iii)
(d) Both (ii) and (iii)

Q2. Which countries are participating in the India-Mozambique-Tanzania Trilateral Exercise (IMT TRILAT-2024)?

- (a) India, Maldives, and Sri Lanka
- (b) India, Mozambique, and Tanzania
- (c) India, Bangladesh, and Myanmar
- (d) India, Indonesia, and Thailand

Q3. The Asiatic lion population largely resides in the protected park area of

- (a) Bhitarkanika National Park
- (b) Gir National Park
- (c) Balphakram National Park
- (d) Anamudi Shola National Park

Q4. The fraction equivalent to $0.474747\dots$ is:

- (a) $\frac{27}{9}$
- (b) $\frac{27}{100}$
- (c) $\frac{11}{27}$
- (d) $\frac{47}{99}$

Q5. The rate of increase in ex-ante consumption due to a unit increment in income is called

- (a) marginal propensity to save
- (b) average propensity to consume
- (c) marginal propensity to consume
- (d) average propensity to save

Q6. Which of the following numbers will replace the question mark (?) in the given series?

13, 21, 33, 54, 91, ?

- (a) 162
- (b) 153
- (c) 175
- (d) 183

Q7. Three statements are given, followed by two conclusions numbered I and II. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:

1. Some avalanches are precipitations.
2. Some cataclysms are avalanches.
3. All avalanches are storms.

Conclusions:

- I. Some storms are cataclysms.
 - II. No precipitation is storms.
- (a) Neither conclusion I nor II follows
(b) Both conclusions I and II follow
(c) Only conclusion II follows
(d) Only conclusion I follows

Q8. In a certain code language, TRIP is written as WULS and SOME is written as VRPH. How will CLAN be written in the same language?

- (a) FODQ
- (b) FODR
- (c) FOEQ
- (d) FPDQ

Q9. A and B invest Rs.42,000 and Rs.56,000 respectively, in a business. At the end of the year they make a profit of Rs.87,220. Find B's share in the profit.

- (a) Rs.47,240
- (b) Rs. 49,840
- (c) Rs.48,480
- (d) Rs. 45,620

Q10. Find the mode of the data 2, 2, 3, 5, 15, 15, 15, 20, 21, 23, 25, 15, 23, 25

- (a) 21
- (b) 25
- (c) 23
- (d) 15

Q11. What is the angle traced by the hour hand in 23 minutes?

- (a) 11.5°
- (b) 12°
- (c) 13°
- (d) 12.5°

Q12. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation?

$$48.9 \times 3.95 - 2.97 + 17.86 = ?$$

- (a) 211
- (b) 250
- (c) 125
- (d) 140

Q13. Three statements are followed by three conclusions numbered I, II and III. You have to consider these statements to be true, even if they seem to be at variance with commonly known facts, and decide which of the given conclusions logically follow/s from the given statements.

Statements:

All toys are plastics.

All plastics are disposables.

Some toys are fibres.

Conclusions:

(I) Some fibres are plastics.

(II) Some disposables are fibres.

(III) No fibre is a disposable.

(a) Only conclusions I and II follow

(b) Either conclusion I or conclusion III follows

(c) Only conclusions II and III follow

(d) None of the conclusions follow

Q14. All the compounds of which of the following sets belongs to the same homologous series?

(a) C_2H_6, C_2H_4, C_2H_2

(b) $C_3H_8, C_4H_{10}, C_5H_{12}$

(c) $C_6H_{10}, C_6H_{12}, C_6H_{14}$

(d) $C_4H_8, C_5H_8, C_6H_{10}$

Q15. Two angles are complementary. The larger angle is 6° less than thrice the measure of the smaller angle. What is the measure of the larger angle?

(a) 66°

(b) 54°

(c) 63°

(d) 57°

Q16. Oral contraceptive pills work by stopping

(a) ovulation

(b) Ovulation and fertilization

(c) fertilization and implantation

(d) ovulation and implantation

Q17. If each interior angle of a regular polygon is 135° , then the number of sides that polygon has is:

(a) 15

(b) 10

(c) 8

(d) 12

Q18. Who has been selected as the flagbearer for the Indian team at the Paris 2024 Olympics?

- (a) Saina Nehwal
- (b) PV Sindhu
- (c) Sharath Kamal
- (d) Manika Batra

Q19. The smallest natural number that must be added to 1212 to make it a perfect square is:

- (a) 13
- (b) 27
- (c) 18
- (d) 24

Q20. Calcium sulphate dihydrate is the chemical name of:

- (a) gypsum
- (b) washing soda
- (c) plaster of Paris
- (d) baking powder

Q21. If 10% of 24% of x is 240, then $x = ?$

- (a) 100000
- (b) 10000
- (c) 1000
- (d) 100

Q22. A certain number of people are sitting in a row, facing the north. Only 7 persons sit between F and U. F is at one of the extreme ends of the row. Only 9 persons sit between H and U. Only 12 persons sit between E and H. E is at the extreme right end. H is at the 19th position from the extreme left end. H is 14th from the extreme right end. If no other person is sitting in the row, what is the total number of persons seated?

- (a) 31
- (b) 33
- (c) 32
- (d) 34

Q23. What is the theme for World Meteorological Day 2024?

- (a) "Global Climate Awareness"
- (b) "Weather Forecasting Innovations"
- (c) "At the Frontline of Climate Action"
- (d) "Meteorological Advances for Sustainable Development"

Q24. Select the option that is related to the fifth number in the same way as the second number is related to the first number and the fourth number is related to the third number.

3:12::25:78::21:?

- (a) 48
- (b) 42
- (c) 66
- (d) 63

Q25. An optical device Y has positive focal length Y is:

- (a) either a convex lens or a concave mirror
- (b) either concave lens or a convex mirror
- (c) either a convex lens or a convex mirror
- (d) either a concave lens or a concave mirror

Q26. Mendeleev's Periodic Law states that:

- (a) the properties of elements are the periodic function of their colour
- (b) the properties of elements are the periodic function of their atomic numbers
- (c) the properties of elements are the periodic function of their magnetic properties
- (d) the properties of elements are the periodic function of their atomic masses

Q27. Which organization in India appointed Sadanand Vasant Date as its new Director General?

- (a) Central Bureau of Investigation (CBI)
- (b) National Investigation Agency (NIA)
- (c) Intelligence Bureau (IB)
- (d) Research and Analysis Wing (RAW)

Q28. P,Q,R,S and T are sitting in a straight row, facing north. Neither Q nor S sit at the exact central position of the row. R is adjacent to S, while P and I are sitting at the extreme ends of the row. Who is sitting at the exact central position of the row?

- (a) Q
- (b) T
- (c) R
- (d) S

Q29. Two pipes X and Y can fill a cistern in 21 hours and 24 hours, respectively. The pipes are opened simultaneously and it is found that due to a leakage in the bottom it takes 48 minutes more to fill the cistern. When the cistern is full, in how much time will the leak empty it if no pipe is open during that time?

- (a) 130 hours
- (b) 168 hours
- (c) 144 hours
- (d) 120 hours

Q30. Which of the following numbers will replace the question mark (?) in the given series?

2,14,70,210,?

- (a) 410
- (b) 420
- (c) 630
- (d) 210

Q31.

If $AB = x + 3$, $BC = 2x$ and $AC = 4x - 5$,
then for what value of ' x ' does B lie on AC ?

- (a) 2
- (b) 5
- (c) 8
- (d) 3

Q32. Which of the following is NOT a part of the 5 R's needed to be followed for sustainable development?

- (a) Recycle
- (b) Regeneration
- (c) Refuse
- (d) Repurpose

Q33. Three of the following statements pertaining to non-biodegradable plastics indicate their implications on animals, plants and our surrounding. Choose the odd one out.

- (a) Choke the drains
- (b) Reduce the fertility of the soil
- (c) Plastic bags are durable carry bags
- (d) Can prove fatal when eaten by animals

Q34. A class of 30 students appeared in a test. The average score of 12 students is 80 , and that of the rest is 75 . What is the average score of the class?

- (a) 87
- (b) 67
- (c) 77
- (d) 56

Q35. Which of the following pairs of numbers are co-primes?

- (a) 12 and 18
- (b) 17 and 170
- (c) 34 and 35
- (d) 7 and 14

Q36. Study the given letter, symbol series and answer the question that follows.

L a SOJ^ ^ BU#WR<EM @ NU#B*H ! A & LEW%H&GA*SA#LD

How many consonants are immediately preceded by a symbol and immediately followed by a vowel?

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

Q37. About 85% of the Indian population of colonial India depended on which of the following sector of the economy.

- (a) Hospitality and real estate
- (b) Handicraft industries
- (c) Agriculture
- (d) Transport

Q38. Caustic soda is generally NOT used in the

- (a) detergent industry
- (b) paper and pulp industry
- (c) manufacture of ammonia
- (d) fabric industry

Q39. Refer to the following number series and answer the question.

(Left) 44 3 15 6 1 5 9 8 3 62 7 9 1 26 41 3 82 5 3 (Right)

If all the numbers in the series are arranged in ascending order, then which number will be fourth from the left?

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

Q40. What is the purpose of the Shiksha Reform online learning platform launched in Surat?

- (a) Promoting traditional teaching methods
- (b) Enhancing agricultural practices
- (c) Modernizing education
- (d) Improving healthcare facilities

Q41. The first and second members, respectively, of the ketone homologous series are:

- (a) butanone, propanone
- (b) propanone, butanone
- (c) methanone, ethanone
- (d) ethanone, propanone

Q42. If $3x - 2y = 10$ and $xy = 11$, the value of $27x^3 - 8y^3$ is

- (a) 2980
- (b) 2569
- (c) 3336
- (d) 3170

Q43. The diagonal and one side of a rectangular plot are 65m and 63m, respectively. What is the perimeter of the rectangular plot?

- (a) 158m
- (b) 256m
- (c) 225m
- (d) 196m

Q44. What will come in place of the question mark (?) in the following equation, if '+' and '-' are interchanged and also '÷' and '×' are interchanged?

$$8 - 13 + 18 \div 9 \times 3 = ?$$

- (a) -33
- (b) -32
- (c) 32
- (d) 33

Q45. Identify the FALSE statement.

- (a) The sunflower is a phototropic plant.
- (b) The growth of pollen tubes towards ovules is an example of geotropism
- (c) Geotropism is demonstrated by the downward migration of roots.
- (d) Hydrotropism is the tendency to grow in moist areas, i.e., the movement of roots towards high humidity.

Q46. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation?

$$26.52 \times 3.89 - 7.79 \times 2 + 27.39 = ?$$

- (a) 136
- (b) 82
- (c) 119
- (d) 181

Q47. 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 its constituent digits. E.g. 13 - Operations on 13 such as adding / deleting/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)

- (12,51,5)
- (5,36,7)
- (a) (14,120,16)
- (b) (19,44,3)
- (c) (13,10,7)
- (d) (11,51,6)

Q48. Given below are three statements and three conclusions. Take the statements to be true even if they are at variance with commonly known facts, and decide whether the conclusion/s follow/s the given statements.

Statements:

- I. Some trees are bushes.
- II. Some bushes are creepers.
- III. Some creepers are stems.

Conclusions:

I. Some stems are trees.

II. Some creepers are trees.

III. Some stems are bushes.

(a) Only conclusion I follows

(b) Conclusions II and III follow

(c) None of the conclusions follow

(d) Conclusions I and II follow

Q49. A statement is given, followed by four conclusions given in the options. Find out which conclusion is true based on the given statement.

Statement: $K=U=R>N>E>G<W$

(a) $K=N$

(b) $W<N$

(c) $K<N$

(d) $G<R$

Q50. Find the roots of $\frac{6}{x} - \frac{2}{x-1} - \frac{1}{x-2} = 0$

(a) $\frac{4}{5}$ and $\frac{3}{2}$

(b) $\frac{4}{3}$ and $\frac{3}{2}$

(c) $\frac{4}{3}$ and 3

(d) $\frac{4}{5}$ and 3

Q51. I, K, L, H, G, F, D and S live on eight different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 8. L lives exactly one floor above K and exactly one floor below G. Only K lives between H and L, whereas H lives exactly one floor above J. Only D lives between S and J. F lives on the 8th floor, while S lives on the 1st floor:

On which floor does K live?

(a) 5th

(b) 7th

(c) 3rd

(d) 4th

Q52. Two wires A and B are made of same material and have the same length but different cross-sectional areas. If the resistance of wire A is 9 times the resistance of wire B, the ratio of the radius of wire A to that of wire B is:

(a) 9:1

(b) 1:9

(c) 3:1

(d) 1:3

Q53. If $x^2 + 2x + 9 = (x - 2)(x - 3)$, then the resultant equation is:

- (a) a cubic polynomial
- (b) not a quadratic equation
- (c) a cubic equation
- (d) a quadratic equation

Q54. The apparent position of a star keeps on changing slightly because:

- (a) the atmosphere scatters star light
- (b) the physical conditions of the atmosphere keep changing
- (c) the atmosphere consists of a mixture of gases
- (d) the physical conditions of the atmosphere are stationary

Q55. If $a + b = 56$ and $(a - b)^2 = 496$, find the value of product of a and b .

- (a) 660
- (b) 760
- (c) 560
- (d) 460

Q56. Which of the following established by Raja Rammohan Roy was a precursor in socio-religious reforms in Bengal?

- (a) Atmiya Sabha
- (b) Prarthana Samaj
- (c) Dharma Sabha
- (d) Arya Samaj

Q57. The formation of water from hydrogen and oxygen is an example of

- (a) oxidation and reduction
- (b) decomposition reaction
- (c) combination reaction
- (d) displacement reaction

Q58. Who has been appointed as the Managing Director & Chief Executive Officer (MD & CEO) of the Bank of Maharashtra?

- (a) Nidhu Sharma
- (b) Rahul Sharma
- (c) Nidhu Saxena
- (d) Vikram Singh

Q59. In how many years will a sum of Rs. 10,000 become Rs. 13,310 at 10% compound interest per annum, compounded annually?

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

Q60. Which of the following reactions represents symbolic combination reaction?

- (a) $A+B \rightarrow C$
- (b) $PQ+R \rightarrow PR+Q$
- (c) $XY \rightarrow X+Y$
- (d) $AB+CD \rightarrow AC+BD$

Q61. What is the purpose of the Saksham App introduced by the Election Commission?

- (a) To organize political rallies
- (b) To address the needs of voters above 85 years of age and PWDs
- (c) To count votes electronically
- (d) To monitor election campaigns

Q62. Where is the Archaeological Survey of India (ASI) conducting excavations to uncover potentially the oldest temple in India?

- (a) Nachne village, Panna district, Madhya Pradesh
- (b) Mumbai city, Maharashtra
- (c) Kolkata city, West Bengal
- (d) Jaipur city, Rajasthan

Q63. How many seconds will a boy take to run one complete round around a square field of side 38 metres, if he runs at a speed of 6 km/h ?

- (a) 71.2
- (b) 50.1
- (c) 61.2
- (d) 91.2

Q64. Which of the following was the guest nation at the Hyderabad Literary Festival 2022?

- (a) United Kingdom
- (b) Australia
- (c) China
- (d) Canada

Q65. Recently, which space company has successfully test-fired the 'Kalam-250' at the propulsion testbed of the ISRO?

- (a) Bellatrix Aerospace
- (b) AgniKul Cosmos
- (c) Skyroot Aerospace
- (d) Kawa Space

Q66. The area (in square units) of the triangle formed by the vertices (0,2),(2,3) and (3,1) is:

- (a) 4.4
- (b) 2.5
- (c) 3.5
- (d) 5.5

Q67. The magnetic field produced due to a circular coil carrying a current having six turns will be how many times that of the field produced due to a single circular loop carrying the same current?

- (a) 2 times
- (b) 4 times
- (c) 8 times
- (d) 6 times

Q68. The 2024 Abel Prize has been awarded to _____ of the French National Center for Scientific Research (CNRS), Paris, France.

- (a) John Smith
- (b) Michel Talagrand
- (c) Emily Johnson
- (d) David Brown

Q69. How many autosomes will be present in a sexually reproducing organism with the chromosome number $2n = 18$?

- (a) 15
- (b) 17
- (c) 16
- (d) 18

Q70. If $\sin(\theta + 17^\circ) = \cos 43^\circ$, then what is the value of $\cot 2\theta$?

- (a) $1/2$
- (b) $1/\sqrt{3}$
- (c) $\sqrt{3}$
- (d) 1

Q71. How many such pairs of letters are there in the word 'CAPITAL' (in both forward and backward directions) each of which have as many letters between them in the word as there are in the English alphabetical order?

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

Q72. A man buys 15 identical articles for a total of Rs. 15. If he sells each of them for Rs. 1.23, then his profit percentage is:

- (a) 23%
- (b) 32%
- (c) 50%
- (d) 8%

Q73. A metallic wire having resistivity ρ is cut into four equal parts. The resistivity of each part is:

- (a) $\rho/2$
- (b) $\rho/4$
- (c) ρ
- (d) 4ρ

Q74. Which Article deals with protection of life and personal liberty?

- (a) Article 12
- (b) Article 22
- (c) Article 21
- (d) Article 31

Q75. Which of the following is the most electropositive element?

- (a) Cs
- (b) Ca
- (c) Na
- (d) Mg

Q76. A spherical mirror forms an erect and diminished image. Identify the correct statement(s) about the spherical mirror:

- (A) The mirror is concave.
 - (B) The mirror forms a virtual image.
 - (C) The mirror has positive focal length.
- (a) Only A
(b) Only B
(c) Both B and C
(d) Both A and B

Q77. _____ is represented by the root apex's constantly dividing cells.

- (a) Meristematic growth
- (b) Germination
- (c) Increase hormonal level
- (d) Maturation

Q78. This question is based on the five, four-digit numbers given below:

(Left) 4178 6235 3716 2253 5675 (Right)

(Example: 6972 - First digit =6, second digit =9, third digit =7 and fourth digit=2)

(NOTE - All operations to be done from left to right.)

If 3 is added to the first digit and 2 is subtracted from the last digit of every number, what will be the product of the third digit of the largest number and the second digit of the smallest number?

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

Q79. Based on the given statement, two conclusions are drawn. Find out which conclusion is true based on the statement.

Statement: $B \geq M > G, S < G \geq Y = L$

Conclusions:

1. $B > Y$
 2. $M = L$
- (a) Both conclusions 1 and 2 are true
(b) Only conclusion 2 is true
(c) Only conclusion 1 is true
(d) Neither conclusion 1 nor 2 is true

Q80. Select the option that is related to the fifth letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster and the fourth letter-cluster is related to the third letter-cluster.

SMII E : ELIMS :: MASIE : ETSAM :: SIARV : ?

- (a) SRVAT
(b) VRATS
(c) VTARS
(d) VRTAS

Q81. Find the smallest number by which 6300 must be multiplied to make it a perfect square.

- (a) 6
(b) 12
(c) 15
(d) 7

Q82. Magnification produced by a lens is equal to:

- (a) v/u
(b) $-v/u$
(c) u/v
(d) $-u/v$

Q83. Some factors that reduce the activity of the kidneys leading to accumulation of poisonous wastes in the body are mentioned below. Select the INCORRECT option.

- (a) Not smoking
(b) Restricted blood flow to kidney
(c) Injury
(d) Infection

Q84. In a certain code language, 'LEFT' is written as 'VGFN' and 'DESK' is written as 'MTFF'. How will 'HELP' be written in that language?

- (a) RNFJ
(b) QMFJ
(c) RMFJ
(d) SMFJ

Q85. In which of the following years was The Indian Official Language Act passed?

- (a) 1973
- (b) 1953
- (c) 1963
- (d) 1936

Q86. Which of the following events takes place during diastole in the human heart?

- (a) Blood enters the aorta
- (b) Blood enters the lungs
- (c) Blood leaves the ventricle
- (d) Blood enters the ventricle

Q87. If the successive discounts of 25%, 15 % and 40 %, then find the equivalent percentage for a single discount.

- (a) 61.75 %
- (b) 43.52 %
- (c) 38.81 %
- (d) 44.54%

Q88. Read the given statement and conclusions carefully. Assuming that the information given in the statements is true, decide which of the given conclusions logically follow(s) from the statement.

Statement:

Cyclone Sepa is expected to make landfall by 3 p.m. today on the Balasore coast. Rough seas, heavy rain and strong winds are expected to lash Balasore from 11a.m. onwards. Power supply in Balasore is likely to be affected from 2 p.m. to 9 p.m.

Conclusions:

- I. There could be power cuts in Balasore after 3 p.m. today.
- II. It would be unsafe for fishermen to venture out into the sea today, till the cyclone passes.

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

Q89. Q started from a point and walked towards the south for 42m, then from there he turned right and walked 2m, then he turned right again and walked 30m, and then turned left and walked 10m. In which direction is Q facing now?

(All turns are 90 degree turns only)

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

Q90. Study the given letter series and answer the question that follows.

K I O X J E T R U L E B A C K J M N

How many such vowels are there each of which is immediately followed by atleast two consonants appearing together in the above series?

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

Q91. Which of the following alphanumeric clusters will replace the question mark (?) in the series to make it logically complete?

BE 2, GJ 3, LO 5, QT 7, ?

- (a) VY 6
- (b) VY11
- (c) WX 7
- (d) WX 6

Q92. In how much time will the simple interest on a certain sum of money be $\frac{3}{8}$ times of the sum at 15% per annum?

- (a) 3 years
- (b) 2.5 years
- (c) 3.5 years
- (d) 2 years

Q93. By selling a table for Rs. 3471, there is a loss of 11%. If it is sold for Rs.4563, then the profit percentage is:

- (a) 17%
- (b) 19%
- (c) 16%
- (d) 18%

Q94. Vikas took a bus from a bus stop. The bus travelled 50m towards the west. Then, it took a right turn and travelled 70m. Then, it took a left turn and travelled 15m. Then, it took a left turn and travelled 30m. Then, it took a left turn and travelled 35m. Then, it took a right turn and travelled 10m. Finally, it took a left turn and travelled 30m to reach the school. How far and in which direction is the bus stop from the school? (All turns are 90 degree turns only)

- (a) 40m, East
- (b) 30m, North
- (c) 30m, South
- (d) 40m, South

Q95. Safflower, shisham, khair, arjun and mulberry are the main trees of which vegetation?

- (a) Mangrove Forests
- (b) Montane Forests
- (c) Tropical Evergreen Forests
- (d) Tropical Deciduous Forests

Q96. Which of the following was the first city planned by Mughal Empire?

- (a) Fatehpur Sikri
- (b) Islamabad
- (c) Delhi
- (d) Agra

Q97. To connect a number of resistors in parallel can be considered equivalent to:

- (a) increasing length of the conductor
- (b) decreasing cross sectional area of the conductor
- (c) increasing resistance of the conductor
- (d) increasing cross sectional area of the conductor

Q98. G,H,I,J,K and L live on six different floors of the same building. The lowermost floor in the building is numbered 6 , the floor above it is numbered 5 , and so on till the topmost floor is numbered 1 .

J lives on an even numbered floor. G and K each live on an odd numbered floor. I lives on floor number 2. H lives on an odd numbered floor, immediately above L and immediately below I. G does not live on the topmost floor. Who lives on the lowermost floor?

- (a) J
- (b) K
- (c) L
- (d) G

Q99. Which of the following medicinal plants is the best remedy to treat blood pressure?

- (a) Sarpagandha
- (b) Rajnigandha
- (c) Alukam
- (d) Navmallika

Q100. Which of the following is the greatest number that divides 72 and 119 and leaves 3 and 4 as respective remainders?

- (a) 21
- (b) 23
- (c) 17
- (d) 19

Solutions

S1. Ans.(a)

Sol. The Correct answer is (a)

- Increasing the number of turns in the coil increases the induced EMF and thus the induced current, because the change in magnetic flux affects more loops.
- Increasing the speed of the magnet increases the rate of change of the magnetic flux through the coil, leading to a higher induced EMF and hence a greater induced current.
- Increasing the resistivity of the wire of the coil would actually decrease the induced current because it increases the resistance of the coil, making it harder for the current to flow.

S2. Ans.(b)**Sol.** Correct answer is (b)

The India-Mozambique-Tanzania Trilateral Exercise (IMT TRILAT-2024) involves the countries mentioned in its name, which are India, Mozambique, and Tanzania. This exercise is a clear representation of the growing defense and strategic partnership among these nations, focusing on enhancing maritime security, combating piracy, and promoting safety and stability in the Indian Ocean Region. Such trilateral exercises are pivotal for fostering cooperation, understanding, and interoperability among the navies of the participating countries, aiming to ensure a secure maritime environment and promote peace in the region. Therefore, the correct answer is (b) India, Mozambique, and Tanzania.

S3. Ans.(b)

Sol. The Asiatic lion population largely resides in Gir National Park. This protected area, located in Gujarat, India, serves as the last stronghold for the Asiatic lion in the wild. The park was established to protect this endangered species, which has seen its numbers increase due to conservation efforts

S4. Ans.(d)**Sol.**

$$\text{Let } x = 0.474747\dots$$

$$100x = 47.4747\dots$$

$$100x - x = 47.47474\dots - 0.4747474\dots$$

$$99x = 47$$

$$x = \frac{47}{99}$$

S5. Ans.(c)

Sol. The rate of increase in ex-ante consumption due to a unit increment in income is referred to as the (c) marginal propensity to consume (MPC).

The MPC measures the extent to which consumption changes when income increases by one unit. It's a concept from Keynesian economics that captures the idea that households will tend to spend a portion of any additional income they receive.

Mathematically, it is defined as the change in consumption (ΔC) divided by the change in income (ΔY):

$$MPC = \frac{\Delta C}{\Delta Y}$$

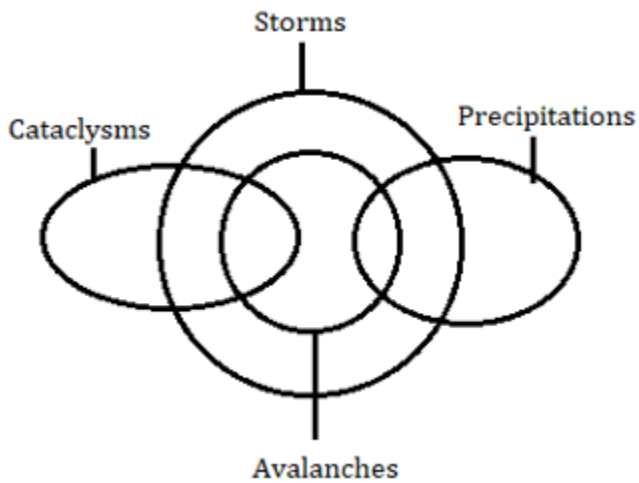
S6. Ans.(b)**Sol.**

13	21	33	54	91	?
<div style="display: flex; justify-content: space-around; width: 100%;"> +8 +12 +21 +37 +62 </div>					
<div style="display: flex; justify-content: space-around; width: 100%;"> +4 +9 +16 +25 </div>					
<div style="display: flex; justify-content: space-around; width: 100%;"> 2² 3² 4² 5² </div>					

153

S7. Ans.(d)

Sol.

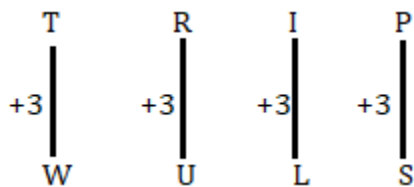


I. Right

II. Wrong

S8. Ans.(a)

Sol.



Similar code used for "CLAN".

S9. Ans.(b)

Sol.

Capital ratio of A and B be 3 : 4.
Profit will be distributed in capital ratio.

So,

$$B's \text{ share} = 87,220 \times \frac{4}{7} = 49,840$$

S10. Ans.(d)

Sol. The number which repeated maximum times is called mode.

15 repeated 4 times so 15 will be the mode of the given series.

S11. Ans.(a)

Sol.

Minutes = 23

$$\text{Hours} = 23 \times \frac{1}{60} = \frac{23}{60}$$

$$\text{Now, angle traced} = 30 \times \frac{23}{60} = 11.5^\circ$$

S12. Ans.(a)

Sol. $48.9 \times 3.95 - 2.97 + 17.86 = ?$

$193.155 - 2.97 + 17.86 = ?$

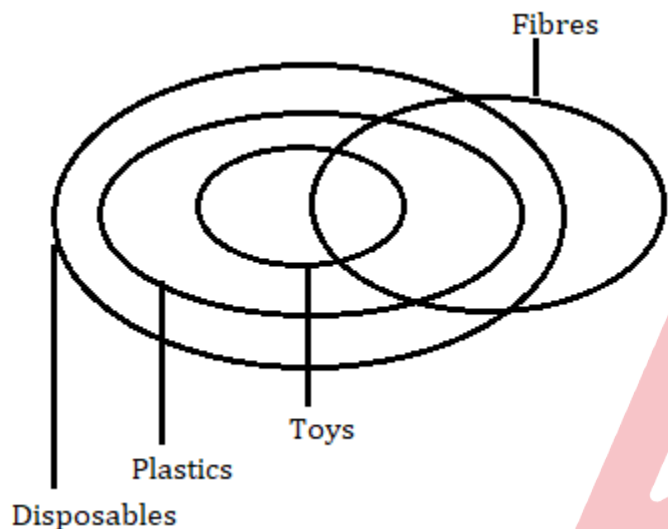
$211.015 - 2.97 = ?$

$208.045 = ?$

211 is the closest approximate value of the equation.

S13. Ans.(a)

Sol.



I. Right

II. Right

III. Wrong

S14. Ans.(b)

Sol. The Correct answer is (b) $C_3H_8, C_4H_{10}, C_5H_{12}$

These compounds are propane, butane, and pentane, respectively. They all belong to the alkane series, which has the general formula C_nH_{2n+2} . They differ by a CH_2 group between each successive member, indicating they are part of the same homologous series.

S15. Ans.(a)

Sol.

Let the complementary angle be x° and $(90^\circ - x)$

$$x^\circ = 3(90^\circ - x) - 6^\circ$$

$$x^\circ = 270^\circ - 3x - 6^\circ$$

$$x^\circ = 66^\circ$$

Larger angle = 66°

Smaller angle = $90^\circ - 66^\circ = 24^\circ$

S16. Ans.(a)

Sol. Oral contraceptive pills primarily work by stopping (a) ovulation

They prevent the ovary from releasing an egg, thereby preventing fertilization from occurring because there is no egg available for sperm to fertilize. Additionally, oral contraceptives can also thicken cervical mucus to hinder sperm movement and alter the uterine lining to reduce the likelihood of implantation, but their primary mechanism is to prevent ovulation.

S17. Ans.(c)

Sol.

Each interior angle of a polygon = 135°

Sum of all the interior sides of a polygon = $(n-2) \times 180^\circ$

$$= (n-2) \times 2 \times 90^\circ$$

$$= (2n-4) \times 90^\circ$$

Each side is given by $\frac{(2n-4) \times 90^\circ}{n}$

$$\therefore \frac{(2n-4)}{n} \times 90^\circ = 135^\circ$$

$$\Rightarrow \frac{2n-4}{n} = \frac{135}{90}$$

$$\Rightarrow 4n-8=3n$$

$$\Rightarrow 4n-3n=8$$

$$\Rightarrow n=8 \text{ sides}$$

S18. Ans.(c)

Sol. Correct answer is (c)

Sharath Kamal has been selected as the flagbearer for the Indian team at the Paris 2024 Olympics. He is a veteran table tennis player, a two-time Commonwealth Games champion, and a recipient of the Khel Ratna award, India's highest sporting honor. This decision was announced by the Indian Olympic Association (IOA), marking a significant recognition of Sharath Kamal's contributions to the sport and his role as a leading figure in Indian athletics. Therefore, the correct answer is (c) Sharath Kamal.

S19. Ans.(a)

Sol.

$$\begin{array}{r|l}
 & 35 \\
 3 & \overline{1212} \\
 & -9 \\
 \hline
 65 & 312 \\
 5 & -325 \\
 \hline
 & -13
 \end{array}$$

From the above calculation, we obtained (-13) as a remainder, if this number is added with 1212 we can obtain a perfect square number.

So, the perfect square number should be 1225 of 352.

The smallest natural number which be added is $1225-1212 = 13$.

Hence, the required smallest number is 13, added with 1212 to make it a perfect square.

S20. Ans.(a)

Sol. Calcium sulphate dihydrate, with the chemical formula $CaSO_4 \cdot 2H_2O$, is the scientific name for gypsum. Gypsum is a mineral widely used in the construction industry for making plasterboard and in agriculture as a soil conditioner. It is characterized by its softness and can be easily ground to a fine powder. The "dihydrate" part of the name indicates that each molecule of calcium sulphate is associated with two molecules of water. This is what differentiates gypsum from other forms of calcium sulphate, such as anhydrite ($CaSO_4$) which contains no water, and plaster of Paris which is partially dehydrated. Therefore, the correct answer to the question is (a) gypsum

S21. Ans.(b)

Sol. 10% of 24% of x = 240

$$x = 10,000$$

S22. Ans.(c)

Sol.

$$\begin{array}{ccccccc} & & & & & & 19^{\text{th}} \\ & & & & & & \cdot \\ \hline & & & & & & \\ F & 7 \text{ person} & U & 9 \text{ Person} & H & 12 \text{ person} & E \\ \hline & & & & & & \\ & & & & & & 14^{\text{th}} \\ \hline \end{array}$$

There are 32 persons seated in the row.

S23. Ans.(c)

Sol. Correct answer is (c).

The theme for World Meteorological Day in 2024 is "At the Frontline of Climate Action." This theme underscores the critical need for action against climate change, highlighting the urgency and the roles individuals, communities, and nations must play in addressing climate change effects. By focusing on the frontline of climate action, the theme calls for global cooperation, innovation, and commitment to reducing the impact of climate change and advancing sustainable development goals, particularly those related to climate action

S24. Ans.(c)

Sol. $3 \times 3 + 3 = 12$

$$25 \times 3 + 3 = 78$$

And

$$21 \times 3 + 3 = 66$$

S25. Ans.(a)

Sol. The correct answer is (a) either a convex lens or a concave mirror. Optical devices with positive focal lengths converge light rays, whereas those with negative focal lengths diverge light rays. A convex lens converges light rays to a focal point on the other side of the lens, resulting in a positive focal length. Similarly, a concave mirror reflects light rays and converges them to a focal point in front of the mirror, also indicating a positive focal length.

S26. Ans.(b)

Sol. Mendeleev's Periodic Law states that (b) the properties of elements are the periodic function of their atomic numbers

Originally, Mendeleev organized the periodic table based on atomic masses, but the modern periodic law, refined with the discovery of the atomic number, accurately states that the properties of elements are a periodic function of their atomic numbers. This refinement was made following the discovery of protons and the realization that atomic number, which is the number of protons in an atom's nucleus, uniquely identifies an element and determines its properties and place in the periodic table.

S27. Ans.(b)

Sol. Correct answer is (b)

Sadanand Vasant Date has been appointed as the new Director General of the National Investigation Agency (NIA). The NIA is India's premier counter-terrorist task force. Established in the wake of the 2008 Mumbai terror attacks, its primary role is to investigate and prosecute offenses related to terrorism and certain other national security laws in India. The appointment of Sadanand Vasant Date as the Director General marks a significant leadership change in the organization, reflecting the government's ongoing efforts to strengthen its counter-terrorism capabilities.

About NIA:

The National Investigation Agency (NIA) is India's central counter-terrorism law enforcement agency. It was established by the Indian Government in December 2008 in the aftermath of the Mumbai terror attacks that occurred in November of the same year. The agency was set up under the National Investigation Agency Act, 2008, with a mandate to investigate terror-related crimes across states without special permission from the states.

S28. Ans.(c)

Sol. Here we have 4 sitting position option.

1. P, Q, R, S, I
2. P, S, R, Q, I
3. I, Q, R, S, P
4. I, S, R, Q, P

In all the possible position R is sitting at the exact central position of the row.

S29. Ans.(b)

Sol.

Let the total capacity of the cistern = LCM of 21 and 24 = 168 units

Efficiency of X = $168/21 = 8$

Efficiency of Y = $168/24 = 7$

Total time required to fill the cistern when there is no leakage = $\frac{168}{15} = 11$ hours 12 min.

When there is a leakage in the cistern then total time taken = 11 hours + 12 min + 48 min = 12 hours.

Now the efficiency of the Pipe X, Y and Leakage pipe = $168/12 = 14$ units/hour

Now, Efficiency of the leakage pipe = $15 - 14 = 1$ unit/hours

Time taken by the leakage pipe to empty pipe = $168/1 = 168$ hours

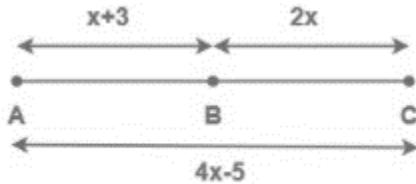
S30. Ans.(d)

Sol.

$$\begin{array}{ccccccc} 2, & 14, & 70, & 210, & ? & 210 \\ \times 7 & \times 5 & \times 3 & \times 1 & & \end{array}$$

S31. Ans.(c)

Sol.



$$AB + BC = AC$$

Putting the values of the given number,

$$x + 3 + 2x = 4x - 5$$

$$3x + 3 = 4x - 5$$

$$4x - 3x = 3 + 5$$

$$x = 8$$

Hence, the value of x is '8'.

S32. Ans.(b)

Sol. The option that is NOT traditionally included in the 5 R's of sustainable development as commonly listed is (b) Regeneration

The 5 R's typically include: Reduce, Reuse, Recycle, Refuse, and Repurpose. These principles are designed to minimize waste and promote sustainable practices by encouraging people to reduce consumption, reuse products, recycle materials, refuse unnecessary items, and repurpose goods instead of disposing of them. While "Regeneration" is an important concept in sustainability, particularly in the context of restoring ecosystems and biodiversity, it is not typically listed as one of the foundational 5 R's in the context of waste management and sustainable development practices.

S33. Ans.(c)

Sol. The odd one out among the given statements, based on their implications on animals, plants, and our surroundings, is (c) Plastic bags are durable carry bags

This statement does not directly imply a negative effect on animals, plants, or the environment, unlike the others which highlight the harmful impacts of non-biodegradable plastics.

S34. Ans.(c)

Sol. Total score of 12 students = Average score of 12 students \times No. of students = $80 \times 12 = 960$

No. of students left = $30 - 12 = 18$

Total score of 18 students = average score of 18 students \times No. of students

$$= 75 \times 18 = 1350$$

Now,

$$\text{Total scores} = 960 + 1350 = 2310$$

$$\text{Average} = \frac{\text{Total scores}}{\text{Total number of students}}$$

$$= \frac{2310}{30} = 77$$

Hence, the average score of the class is 77.

S35. Ans.(c)

Sol. Co-primes are the numbers that do not have any common prime factor.

34 and 35

Prime factorization of 34 = $2 * 17$

Prime factorization of 35 = $5 * 7$

Common factors are zero.

7 and 14

Prime factorization of 7 = 7

Prime factorization of 14 = $2 * 7$

Common factors are one i.e. 7.

12 and 18

Prime factorization of 12 = $2 * 2 * 3$ Prime factorization of 18 = $3 * 3 * 2$

Common factors are two i.e. 2 and 3.

17 and 170

Prime factorization of 17=17

Prime factorization of 170 = $2 * 5 * 17$

Common factors are one i.e. 17.

Thus, the correct answer is "34 and 35".

S36. Ans.(b)

Sol.

L @ S O J ^ B U # W R < E M @ N U # B * H ! A & L E W % H & G A * S A # L D

S37. Ans.(c)

Sol. About 85% of the Indian population of colonial India depended on the agriculture sector of the economy. Therefore, the correct answer is (c) Agriculture

S38. Ans.(c)

Sol. The Correct answer is (c)

Caustic soda is not directly used in the manufacture of ammonia. Ammonia is typically produced using the Haber-Bosch process, which involves the direct combination of nitrogen from the air with hydrogen derived from natural gas or other sources.

S39. Ans.(c)

Sol. Ascending order of the given number series.

1, 3, 3, 3, 3, 5, 5, 6, 7, 8, 9, 15, 26, 41, 44, 62, 82

3 will be on the fourth position from the left end.

S40. Ans.(c)

Sol. Correct answer is (c)

The purpose of the Shiksha Reform online learning platform launched in Surat is to modernize education. This platform is designed to integrate the latest technological advancements with educational methodologies, aiming to improve access to quality education, facilitate interactive learning, and make education more engaging and efficient for students. By leveraging digital tools and resources, Shiksha Reform seeks to enhance the educational experience, enabling personalized learning paths, and making education more accessible to a broader audience. This initiative reflects a broader trend towards embracing digital solutions to improve educational outcomes and prepare students for a rapidly changing world.

S41. Ans.(b)

Sol. The ketone homologous series starts with compounds having at least three carbon atoms, as a ketone group must be attached to two carbon atoms. Therefore, the first member of the ketone series is propanone, and the second is butanone. Thus, the correct answer is (b) propanone, butanone

S42. Ans.(a)**Sol.**

$$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$$

Now,

$$\Rightarrow (3x - 2y)^3 = 10^3$$

$$\Rightarrow 27x^3 - 8y^3 - 3(3x)(2y)(3x - 2y) = 1000$$

$$\Rightarrow 27x^3 - 8y^3 - 3(3x)(2y)(3x - 2y) = 1000$$

$$\Rightarrow 27x^3 - 8y^3 - 18(xy)(3x - 2y) = 1000$$

Putting, $3x - 2y = 10$, $xy = 11$

$$\Rightarrow 27x^3 - 8y^3 - 18 \times 11 \times 10 = 1000$$

$$\Rightarrow 27x^3 - 8y^3 - 1980 = 1000$$

$$\Rightarrow 27x^3 - 8y^3 = 1980 + 1000 = 2980$$

S43. Ans.(a)**Sol.**

$$Diagonal^2 = Length^2 + Breath^2$$

Now,

ATQ

$$65^2 = Length^2 + 63^2$$

$$Length^2 = 16$$

$$Perimeter = 2(63 + 16) \\ = 158$$

S44. Ans.(a)**Sol.**

$$8 - 13 + 18 \div 9 \times 3 = ?$$

After interchanging sign.

$$8 + 13 - 18 \times 9 \div 3 = ?$$

$$= 21 - 54$$

$$= -33$$

S45. Ans.(b)

Sol. The FALSE statement is (b) The growth of pollen tubes towards ovules is an example of geotropism.

Explanation:

- (a) The sunflower is a phototropic plant. This statement is true. Sunflowers exhibit phototropism, meaning they tend to grow towards or orient themselves in response to light. This is particularly noticeable in young sunflower plants, which can rotate their heads to follow the sun across the sky, a phenomenon known as heliotropism, a specific type of phototropism.

- (b) The growth of pollen tubes towards ovules is not an example of geotropism but rather chemotropism. Geotropism (or gravitropism) is the growth of plant parts in response to gravity, such as roots growing downward (positive geotropism) and stems growing upward (negative geotropism). Chemotropism, on the other hand, involves growth or movement in response to a chemical stimulus. In the case of pollen tubes, they grow toward ovules in response to chemical attractants released by the ovules.
- (c) Geotropism is demonstrated by the downward migration of roots. This statement is true. Roots exhibit positive geotropism, meaning they grow in the direction of gravitational pull, which helps anchor the plant and search for nutrients and water in the soil.
- (d) Hydrotropism is the tendency to grow in moist areas, i.e., the movement of roots towards high humidity. This statement is true. Hydrotropism is a growth response in which plant roots grow towards areas with higher moisture levels. This adaptation helps plants to find water in the soil for survival.

S46. Ans.(c)

Sol.

$$\begin{aligned}
 &26.52 \times 3.89 - 7.79 \times 2 + 27.39 = ? \\
 &= 103.1628 - 15.58 + 27.39 \\
 &= 114.9728 \sim 115
 \end{aligned}$$

S47. Ans.(d)

Sol. (1st number + 3rd Number) \times 3 = 2nd Number

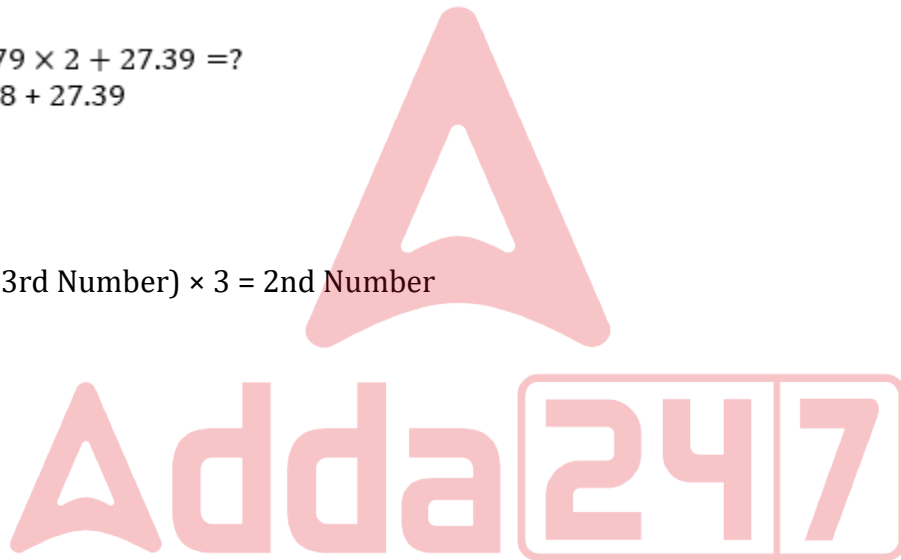
$$(12 + 5) \times 3 = 51$$

And

$$(5 + 7) \times 3 = 36$$

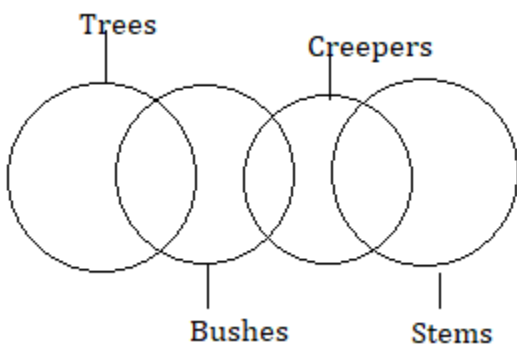
Similarly,

$$(11 + 6) \times 3 = 51$$



S48. Ans.(c)

Sol.



1. Wrong
2. Wrong
3. Wrong

S49. Ans.(d)

Sol. 1. Fales

2. Fales

3. Fales

4. Right

S50. Ans.(c)

Sol.

$$\frac{6}{x} - \frac{2}{x-1} - \frac{1}{x-2} = 0$$

$$\frac{6(x-1)(x-2) - 2x(x-2) - x(x-1)}{x(x-1)(x-2)} = 0$$

On solving the above equation, we get $x = \frac{4}{3}$ and $x = 3$

S51. Ans.(a)

Sol.

8th	F
7th	G
6th	L
5th	K
4th	H
3th	J
2nd	D
1st	S

K lives on the 5th floor of the building.

S52. Ans.(d)

Sol.

The Correct answer is (d) 1:3

The resistance R of a wire is given by the formula:

$$R = \rho \frac{L}{A}$$

Where,

ρ is the resistivity of the material.

L is the length of the wire

A is the cross-sectional area

For cylindrical wires, the area A can be expressed in terms of the radius r as:

$$A = \pi r^2$$

According to the problem, the resistance of wire A is 9 times that of wire B:

$$R_A = 9R_B$$

Substituting the expressions for R_A and R_B , we have:

$$\rho \frac{L}{\pi r_A^2} = 9 \left(\rho \frac{L}{\pi r_B^2} \right)$$

Simplifying, we find:

$$\frac{1}{r_A^2} = 9 \frac{1}{r_B^2}$$
$$r_A^2 = \frac{1}{9} r_B^2$$

Taking the square root of both sides:

$$r_A = \frac{1}{3} r_B$$

Therefore, the ratio of the radius of wire A to that of wire B is 1:3. The correct answer is (d) 1:3

S53. Ans.(b)

Sol. On solving the,

$$\Rightarrow x^2 + 2x + 9 = x^2 - 2x - 3x + 6$$

$$\Rightarrow x^2 + 2x + 9 = x^2 - 5x + 6$$

$$\Rightarrow 2x + 9 = -5x + 6$$

$$\Rightarrow 7x = -3$$

$$\Rightarrow 7x + 3 = 0$$

This is a linear equation.

the resultant equation is not a quadratic equation.

S54. Ans.(b)

Sol. The apparent position of a star keeps on changing slightly primarily because of atmospheric effects. The Earth's atmosphere is constantly in motion, and its density varies with temperature and pressure. These changes can bend the light from stars as it passes through the atmosphere, a phenomenon known as atmospheric refraction. This bending causes the apparent position of stars to change slightly.

S55. Ans.(a)

Sol.

$$\Rightarrow (a - b)^2 = a^2 + b^2 - 2ab$$

$$\Rightarrow (a - b)^2 = ((a + b)^2 - 2ab) - 2ab$$

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

Putting of given values of $(a - b)^2 = 496$ and $a + b = 56$ in above equation, we get,

$$\Rightarrow 496 = 56^2 - 4ab$$

$$\Rightarrow 4ab = 3136 - 496$$

$$\Rightarrow 4ab = 2640$$

$$\Rightarrow ab = 660$$

S56. Ans.(a)

Sol. The precursor in socio-religious reforms in Bengal established by Raja Rammohan Roy was (a) Atmiya Sabha. Founded in 1815.

Atmiya Sabha aimed at promoting social and religious reform, and it played a pivotal role in advocating against practices like Sati, child marriage, and the caste system, while also promoting the education of women and the study of Western sciences alongside traditional Indian scriptures. The Sabha served as a platform for discussing and disseminating progressive ideas that laid the groundwork for the Brahmo Samaj, which Rammohan Roy founded later in 1828.

S57. Ans.(c)

Sol. The formation of water from hydrogen and oxygen is an example of a combination reaction. In a combination reaction, two or more substances combine to form a single new substance. When hydrogen gas (H_2) reacts with oxygen gas (O_2), they combine to form water (H_2O). The reaction can be represented by the balanced chemical equation: $2H_2 + O_2 \rightarrow 2H_2O$. This process involves the oxidation of hydrogen (it gains oxygen) and the reduction of oxygen (it gains hydrogen), making it also an example of a redox reaction. However, among the options provided, the most accurate classification of this process is a combination reaction, as the primary characteristic of the reaction is the combination of two substances to form one product, which directly corresponds to option (c) combination reaction

S58. Ans.(c)

Sol. Correct answer is (c).

- The government of India has approved the appointment of Nidhu Saxena, Executive Director of Union Bank, as the Managing Director (MD) and Chief Executive Officer (CEO) of the public sector bank Bank of Maharashtra.
- Mr Nidhu Saxena's term will be three years, effective from 27 March 2024.
- He replaced A.S Rajeev, who has been recently appointed a Vigilance Commissioner in the Central Vigilance Commission by the government of India.

Bank of Maharashtra:

- Bank of Maharashtra was established as a private bank on 16 September 1935. It started operating from Pune in 1936.
- It was nationalised by the government of India in 1969, along with 13 other private banks.
- Currently, the government of India holds around 86 per cent of the bank's shares.
- Tagline : Ek Parivaar, Ek Bank
- Headquarters: Pune, Maharashtra
- MD and CEO: Nidhu Saxena

S59. Ans.(d)

Sol.

$$13310 = 10000 \left(1 + \frac{10}{100}\right)^t$$

$$\left(\frac{11}{10}\right)^3 = \left(\frac{11}{10}\right)^t$$

$$t = 3$$

It will take 3 years

S60. Ans.(a)

Sol. The reaction that represents a symbolic combination reaction is (a) $A+B \rightarrow C$.

In a combination reaction, two or more substances combine to form a single product. The general form of a combination reaction can be represented as $A + B \rightarrow AB$, where A and B are reactants that combine to form a single product AB.

Option (a) $A+B \rightarrow C$ fits this description, as it shows two substances, A and B, combining to form a single product, C.

- (b) $PQ+R \rightarrow PR+Q$ represents a single replacement reaction, where element R replaces Q in compound PQ to form a new compound PR and releases element Q.
- (c) $XY \rightarrow X+Y$ represents a decomposition reaction, where compound XY breaks down into its constituent elements or simpler compounds, X and Y.
- (d) $AB+CD \rightarrow AC+BD$ represents a double replacement reaction, where parts of two compounds exchange places to form two new compounds.

Therefore, the correct answer is (a) $A+B \rightarrow C$.

S61. Ans.(b)

Sol. Correct answer is (b)

The Saksham App was introduced by the Election Commission with the purpose of addressing the needs of voters above 85 years of age and persons with disabilities (PWDs). This app is part of the Election Commission's efforts to make the voting process more accessible and convenient for elderly voters and those with disabilities, ensuring their participation in the democratic process. By focusing on these groups, the Saksham App aims to facilitate their voting experience, making it more inclusive and barrier-free. This initiative reflects the Commission's commitment to enhancing electoral engagement and ensuring that all sections of society can exercise their voting rights effectively. Therefore, the correct answer is (b) To address the needs of voters above 85 years of age and PWDs.

S62. Ans.(a)

Sol. Correct answer is (a)

The Archaeological Survey of India (ASI) is conducting excavations in Nachna village, Panna district, Madhya Pradesh, to uncover what is potentially the oldest temple in India. This significant archaeological endeavor aims to explore and uncover historical structures that may offer invaluable insights into India's ancient religious architecture and heritage. Nachna village is known for its historical and archaeological importance, and the discovery of the oldest temple in India there would be a remarkable addition to our understanding of ancient Indian civilization and its architectural advancements. Therefore, the correct answer is (a) Nachne village, Panna district, Madhya Pradesh.

S63. Ans.(d)

Sol.

$$\text{Perimeter of the square} = 4 \times \text{side}$$

$$= 4 \times 38 = 152 \text{ m}$$

$$\text{Time} = \text{Distance/speed}$$

$$= 152 / \left(6 \times \frac{5}{18}\right)$$

$$= 91.2 \text{ sec.}$$

S64. Ans.(a)**Sol.** The Correct answer is (a)

The guest nation at the Hyderabad Literary Festival 2022 was the United Kingdom (UK)

The Hyderabad Literary Festival (HLF) 2022, which featured the United Kingdom as the Guest Nation, is a significant cultural event that celebrates literature, ideas, and the arts. This festival typically includes a wide array of activities such as readings, discussions, workshops, and cultural performances, attracting authors, thinkers, artists, and literature enthusiasts from around the world.

S65. Ans.(c)**Sol.** Correct answer is (c)

Skyroot Aerospace recently conducted a successful test-fire of the Kalam-250 at ISRO's Satish Dhawan Space Centre. This second stage of the Vikram-1 space launch vehicle features a carbon composite rocket motor, EPDM thermal protection, and precision thrust vector control. Developed by Skyroot Aerospace, it will propel the launch vehicle from the atmosphere into outer space, playing a vital role in its ascent.

S66. Ans.(b)**Sol.**

$$\text{Area} = \frac{|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|}{2}$$

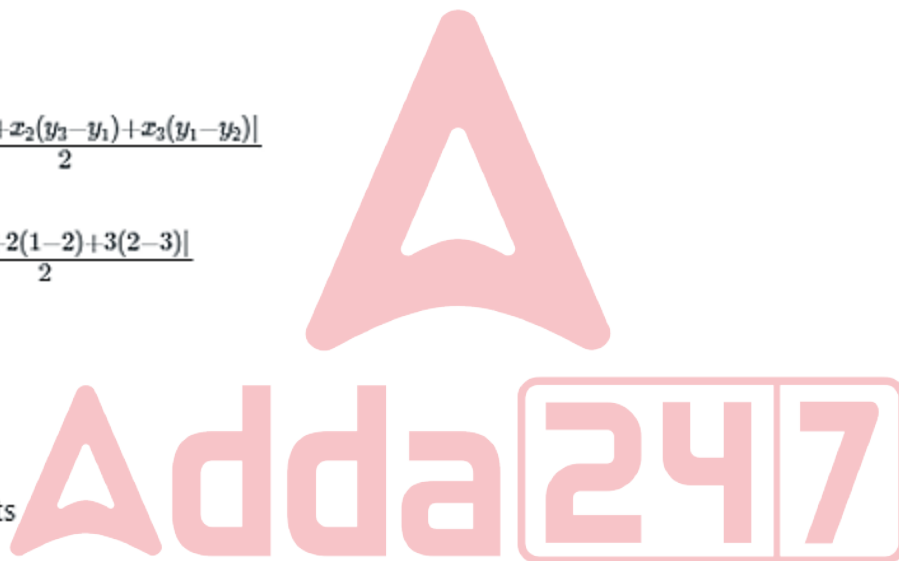
ATQ,

$$\text{Area} = \frac{|0(3-1) + 2(1-2) + 3(2-3)|}{2}$$

$$= \frac{|0-2-3|}{2}$$

$$= \frac{|-5|}{2}$$

$$= 2.5 \text{ square units}$$

**S67. Ans.(d)**

Sol. The magnetic field produced by a circular coil carrying current is directly proportional to the number of turns in the coil. Therefore, if a coil has six turns and carries the same current as a single loop, the magnetic field produced by the coil with six turns will be six times that of the field produced by a single loop. So, the correct answer is:

(d) 6 times

S68. Ans.(b)**Sol.** Correct answer is (b)

The Norwegian Academy of Science and Letters has awarded the 2024 Abel Prize to Michel Talagrand of the French National Center for Scientific Research (CNRS), Paris, France. Talagrand received the prestigious prize "for his groundbreaking contributions to probability theory and functional analysis, with outstanding applications in mathematical physics and statistics."

S69. Ans.(c)

Sol. In a sexually reproducing organism with the chromosome number $2n=18$, the total number of chromosomes is 18, which includes both autosomes and sex chromosomes. Typically, organisms have two sex chromosomes (either XX for females or XY for males in many species). Therefore, to find the number of autosomes, we subtract the number of sex chromosomes from the total number of chromosomes. Since there are 2 sex chromosomes, the calculation will be:

$$\text{Total number of chromosomes (2n) - Number of sex chromosomes} = \text{Number of autosomes } 18 - 2 = 16$$

Therefore, the number of autosomes in this organism is 16.

Correct answer: (c) 16

S70. Ans.(b)

Sol.

$$\sin (\theta + 17)^\circ = \cos 43^\circ$$

$$\sin (\theta + 17^\circ) = \sin (90^\circ - 43^\circ)$$

$$\Rightarrow \theta + 17^\circ + 43^\circ = 90$$

$$\Rightarrow \theta = 90^\circ - 60^\circ = 30^\circ$$

$$\Rightarrow \cot 2\theta = \cot 60^\circ = \frac{1}{\sqrt{3}}$$

S71. Ans.(d)

Sol.

**S72. Ans.(a)**

Sol.

$$\text{CP of 15 identicals} = 15$$

$$\text{CP of 1 identicals} = 1$$

$$\text{SP of the 1 identicals} = 1.23$$

$$\text{Profit \%} = \frac{23}{100} \times 100 = 23 \%$$

S73. Ans.(c)

Sol. Resistivity (ρ) is a material property that quantifies how strongly a material opposes the flow of electric current. The resistivity of a material is independent of its shape and size; it depends only on the material itself and its temperature. Therefore, even if a metallic wire is cut into four equal parts, the resistivity of each part remains the same as that of the original wire.

The correct answer is (c) ρ

S74. Ans.(c)

Sol. Article 21 of the Indian Constitution deals with the protection of life and personal liberty. It states, "No person shall be deprived of his life or personal liberty except according to the procedure established by law." So, the correct answer is (c) Article 21

S75. Ans.(a)

Sol. The most electropositive element among the options given is (a) Cs (Cesium). Electropositivity refers to the ability of an atom to donate electrons, and it generally increases down a group in the periodic table. This is because, as the atomic number increases down a group, the outer electrons are further from the nucleus and are more easily lost, making the element more electropositive. Cesium is located in Group 1 (the alkali metals) and is further down the group than Sodium (Na), making it more electropositive than Na, as well as more electropositive than Calcium (Ca) and Magnesium (Mg), which are in Group 2 (the alkaline earth metals). Therefore, Cesium is the most electropositive element among the ones listed, due to its position in the periodic table, which allows it to lose electrons more readily than the other elements mentioned.

S76. Ans.(b)

Sol. The correct answer is **(b) Only B.**

- **(A) The mirror is concave:** This statement is incorrect. A **convex mirror** always forms an erect and diminished image, regardless of the object's position. A concave mirror can form erect and diminished images only under specific conditions, like when the object is placed between the focal point and the mirror.
- **(B) The mirror forms a virtual image:** This statement is **correct**. A convex mirror always forms a **virtual image**, which means the light rays reflected from the mirror converge at a point behind the mirror, creating an image that cannot be projected onto a screen.
- **(C) The mirror has positive focal length:** This statement is **incorrect**. A convex mirror has a **negative focal length**, meaning the focal point lies in front of the mirror, not behind it.
- Therefore, the only correct statement is **(B) The mirror forms a virtual image.**

S77. Ans.(a)

Sol. The process represented by the root apex's constantly dividing cells is (a) Meristematic growth. Meristematic tissue consists of undifferentiated cells that are capable of continuous cell division. This tissue is found in zones of the plant where growth can take place. The root apex, or apical meristem, is a primary site of growth in plants, where cells divide actively to allow the root to extend further into the soil. This type of growth is crucial for the plant's ability to absorb water and nutrients from the soil and to anchor itself firmly. Meristematic growth is characterized by the production of new cells that can differentiate into various types of plant tissues, leading to the elongation and thickening of the plant's roots and shoots.

S78. Ans.(a)

Sol. If 3 is added to the first digit and 2 is subtracted from the last digit of every number

7176, 9233, 6714, 5251, 8673

New Number will be as shown above,

Largest number = 9233 and smallest number = 5351

Now,

Product of 3 digit of the largest number 3 and second digit of the smallest number 3

= $3 \times 3 = 9$

S79. Ans.(c)

Sol. 1. Right

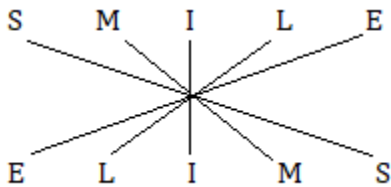
2. wrong

So,

Only conclusion 1 Follows.

S80. Ans.(b)

Sol.



Similar code used for STARV.

S81. Ans.(d)

Sol.

The factor of 6300 = $2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 7$,

There are two 2's in factor, two 3's, two 5's and one 7

So, if we multiply 6300 by 7.

We get: $2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 7 \times 7 = 2^2 \times 3^2 \times 5^2 \times 7^2$ which is perfect square The least number is 7

Hence, we have to multiply 6300 by 7 to make it a perfect square

S82. Ans.(b)

Sol. The magnification produced by a lens is equal to (b) $-v/u$. Magnification is defined as the ratio of the height of the image to the height of the object. It can also be expressed in terms of the image distance (v) and the object distance (u) as $-v/u$. The negative sign indicates that when the image formed is real, it is inverted relative to the object. This formula is a fundamental concept in optics and is used to determine the characteristics of the image formed by a lens, such as its size and orientation relative to the object.

S83. Ans.(a)

Sol. The INCORRECT option among the given factors that would reduce the activity of the kidneys leading to the accumulation of poisonous wastes in the body is (a) Not smoking.

Not smoking is actually beneficial for kidney health and does not lead to reduced kidney activity. On the contrary, smoking is a significant risk factor for the development of kidney disease, as it can impair blood flow to the kidneys, leading to decreased kidney function and an increased risk of kidney-related health issues. Restricted blood flow to the kidney (option b), injury (option c), and infection (option d) are all factors that can indeed impair kidney function, leading to the accumulation of toxic waste products in the body. Therefore, maintaining a lifestyle that includes not smoking can contribute positively to kidney health and prevent the decline in kidney function.

S84. Ans.(c)

Sol.

L E F T
+2 ↓ +1 ↓ +1 ↓ +2 ↓
N F G V
←
V G F N

And

D E S K
+2 ↓ +1 ↓ +1 ↓ +2 ↓
F F T M
←
M T F F

Similar code used for HELP.

H E L P
+2 ↓ +1 ↓ +1 ↓ +2 ↓
J F M R
←
R M F J

S85. Ans.(c)

Sol. The Indian Official Language Act was passed in the year (c) 1963.

This Act was established to provide for the languages which can be used for the official purposes of the Union, for transaction of business in Parliament, for Central and State Acts, and for certain purposes in High Courts. The Official Languages Act, 1963, came into effect following the adoption of Hindi as the official language of the Union government of India, as stipulated in Article 343 of the Indian Constitution. The Act also allows for the continued use of English for official purposes and legislative, administrative, and judicial purposes. This legislation was a significant step in the promotion and regulation of the use of Hindi and English languages in the Indian government's official work.

S86. Ans.(d)

Sol. During diastole in the human heart, the event that takes place is (d) Blood enters the ventricle.

Diastole is the phase of the heart cycle during which the heart muscles relax, allowing the chambers, particularly the ventricles, to fill with blood. After the atria (the upper chambers of the heart) fill with blood, they contract, pushing blood into the ventricles (the lower chambers). This phase contrasts with systole, where the ventricles contract to pump blood out of the heart. Diastole is crucial for the heart's function, as it ensures that the ventricles are filled with enough blood to be pumped throughout the body during the next phase of the heartbeat. This filling process is essential for maintaining adequate blood flow to the body's tissues and organs.

S87. Ans.(a)

Sol.

$$\begin{array}{r} 4 \rightarrow 3 \\ 20 \rightarrow 17 \\ 5 \rightarrow 3 \\ \hline 400 \rightarrow 153 \\ \frac{400-153}{400} \times 100 = \frac{247}{4} = 61.75\% \end{array}$$

S88. Ans.(c)

Sol. Conclusions:

1. There could be power cuts in Balasore after 3 p.m. today. = True (Power supply in Balasore is likely to be affected from 2 p.m. to 9 p.m.)

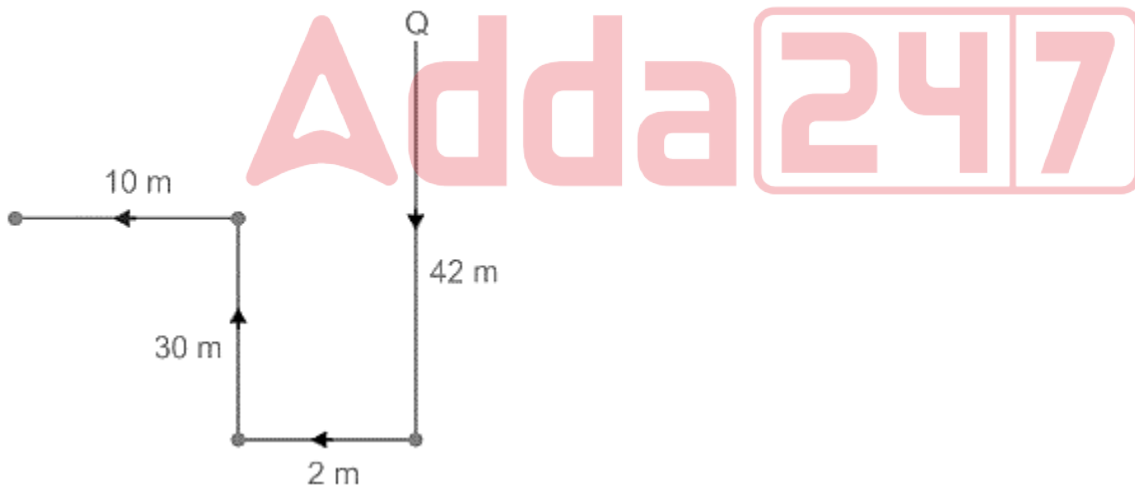
2. It would be unsafe for fishermen to venture out into the sea today, till the cyclone passes. = True (As cyclone Sepa is expected to make landfall and Rough seas, heavy rain and strong winds are expected to lash Balasore from 11 a.m. today.)

So, 'Both conclusions I and II follow'.

Hence, the correct answer is "Option c".

S89. Ans.(c)

Sol.



'Q' is facing in the south direction.

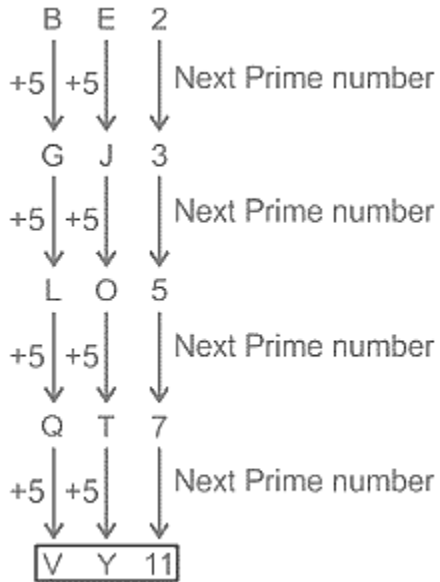
S90. Ans.(b)

Sol.

K I (O X J) E T R U L E B (A C K) J M N

S91. Ans.(b)

Sol.



S92. Ans.(b)

Sol.

$$\frac{3}{8}P = \frac{P \times 15 \times T}{100}$$

$$T = \frac{3 \times 100}{8 \times 15} = \frac{5}{2} \text{ year} = 2.5 \text{ years}$$

S93. Ans.(a)

Sol.

$$3471 = (100 - 11)\% \text{ of CP} = 89\% \text{ of CP}$$

$$4563 = \left(\frac{89}{3471} \times 4563\right) \% \text{ of CP}$$

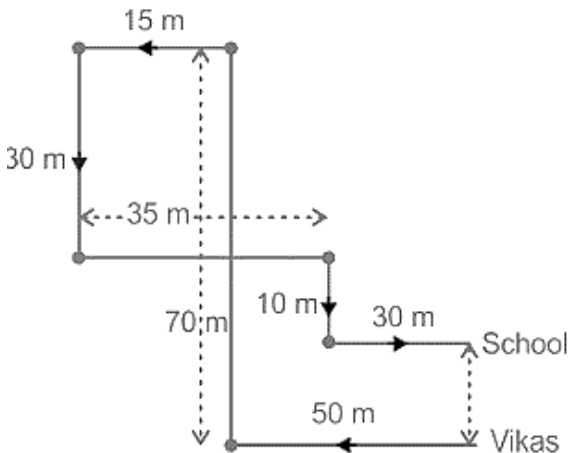
$$= 117\% \text{ of CP}$$

$$\text{Profit} = (117 - 100)\%$$

$$= 17\%$$

S94. Ans.(c)

Sol.



S95. Ans.(d)

Sol. The main trees mentioned – safflower, shisham, khair, arjun, and mulberry – are characteristic of (d) Tropical Deciduous Forests. These forests, also known as the monsoon forests, are found in regions that experience a wide range of climatic conditions, which include a distinct dry season and a wet season. The trees in these forests typically shed their leaves during the dry season to conserve water. Shisham (*Dalbergia sissoo*) and Khair (*Acacia catechu*) are well-adapted to the dry and wet cycles of tropical deciduous forests, making these ecosystems rich in biodiversity. Similarly, Arjun (*Terminalia arjuna*) and Mulberry (*Morus spp.*) are also found in these settings, thriving in the conditions that these forests offer. This type of vegetation is prevalent in many parts of India, where there is a significant variation in rainfall and temperature, leading to the seasonal shedding of leaves by trees.

S96. Ans.(a)

Sol. The first city planned by the Mughal Empire was (a) Fatehpur Sikri. Emperor Akbar, one of the most celebrated rulers of the Mughal dynasty, founded Fatehpur Sikri in 1569. This city served as the capital of the Mughal Empire from 1571 to 1585. Akbar chose this site for its strategic location and due to the prophecy of a saint, Sheikh Salim Chisti, who predicted the birth of Akbar's heir. Fatehpur Sikri is renowned for its architectural grandeur, blending various regional schools of architectural craftsmanship, and incorporates elements of Islamic, Persian, and Indian architectural styles. Despite its magnificence, the city was abandoned shortly after Akbar's death due to the scarcity of water and its proximity to the Rajputana areas which were becoming increasingly restive. This historical site stands today as a UNESCO World Heritage Site, reflecting the architectural ingenuity of the Mughal Empire.

S97. Ans.(d)

Sol. Connecting a number of resistors in parallel is equivalent to (d) increasing cross-sectional area of the conductor.

When resistors are connected in parallel, the overall resistance of the circuit decreases. This is because the current has multiple paths to flow through, effectively increasing the total cross-sectional area available for the current to flow. It's analogous to adding more lanes to a highway, which allows more traffic to flow through simultaneously, reducing the overall resistance to movement.

In terms of electrical conductivity, increasing the cross-sectional area of a conductor allows more electrons to pass through at any given time, reducing the total resistance. Therefore, connecting resistors in parallel reduces the overall resistance, similar to how increasing the cross-sectional area of a conductor would.

S98. Ans.(a)

Sol.



J Lives on the lowest floor.

S99. Ans.(a)

Sol. Among the options provided, (a) Sarpagandha is recognized as the most effective in treating high blood pressure. Sarpagandha, scientifically known as Rauwolfia serpentina, is a well-known medicinal plant traditionally used in Ayurveda and other traditional medicine systems to manage hypertension. It contains alkaloids such as reserpine, which is effective in lowering blood pressure by reducing heart rate and relaxing blood vessels. This makes Sarpagandha a potent antihypertensive agent. On the other hand, Rajnigandha (Tuberosa), Alukam, and Navmallika are not primarily associated with blood pressure management. Therefore, for addressing issues related to blood pressure, Sarpagandha stands out as the most suitable choice among the listed options, due to its specific active compounds and their pharmacological actions on the cardiovascular system.

S100. Ans.(b)

Sol. $72 - 3 = 69$

$119 - 4 = 115$

Now, the greatest number that will divide 69 and 115 completely, is the HCF of these numbers.

Prime factorisation of the numbers,

$69 = 3 * 23$

$115 = 5 * 23$

HCF of 69 and 115 is 23.

Hence, '23' is the required number.

