RRB Group D Previous Year Paper (Held on: 26 Sept 2022 Shift 3)

RRB Group D • 2022 • 100 questions • 90 minutes • Answer key and solutions

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CBT

Q1. A sum of Rs. 10,000 amounts to Rs. 11,025 in 2 years at a certain rate of interest per annum, compounded annually. The rate of interest per annum is:

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

Q2. In a certain code language, 'SOLVE' is coded as 'QRJYC' and FENCE' is coded as 'DHLFC. How will 'TASTE' be coded in that language?

(a) RXQQC
(b) RDQWC
(c) VXUQG
(d) VDUWG

Q3. 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.

NALAYAK : KAYALAN :: BEAUTY : YTUAEB :: POWERTY : ?

(a) WOPREYT
(b) YRTEWOP
(c) YTREWOP
(d) TPWEROY

Q4. Five girls, A, B, C, D, and E are sitting around a circular table facing the centre. E is the immediate neighbour of A and B. D is second to the right of E. C is an immediate neighbour of D and B. Where is A seated?

(a) To the immediate left of E
(b) To the immediate left of C
(c) Third to the right of D
(d) Second to the right of B

Q5. As per Reserve Bank of India (Regulatory Framework for Microfinance Loans) Directions, 2022, a microfinance loan is defined as a collateral-free loan given to a household having annual household income up to _____. For this purpose, the household shall mean an individual family unit, i.e., husband, wife, and their unmarried children.

(a) Rs. 5,00,000
(b) Rs. 2,00,000
(c) Rs. 3,00,000
(d) Rs. 1,25,000

Q6. Which of the following represents a quadratic equation?

(a) $(x - 7)(x + 2) = (x - 2)(x)$

(b) $(x + 2)(x + 2)(x - 1) = x^3 + 5x^2 + 6x + 4$

(c) $(3x + 4)x = 3x^2 + 16$

(d) $(x + 3)(x - 4) = x^2 + 2x + 12$

Q7. Initially Ram had Rs. 4 with him and Shyam had Rs. 7 with him. Jatin gave each of Ram and shyam an equal amount of money and after that the amounts Ram and shyam had were in the ratio 7 : 9. How much money (in Rs.) did Jatin give to each of Ram and Shyam?

(a) 6.50

(b) 7.00

(c) 6.00

(d) 5.50

Q8. In 1938, Congress President Subhash Chandra Bose set up a National Planning Committee. Who was its Chairman?

(a) Maulana Abul Kalam Azad

(b) Lal Bahadur Shastri

(c) Sardar Vallabhbhai Patel

(d) Jawaharlal Nehru

Q9. What is the number of water of crystallisation molecules present in plaster of Paris?

(a) 2

(b) 1

(c) 1/2

(d) 10

Q10. In which of the following years, Uttarakhand had received an unusual amount of rainfall, which led to the melting of the Chorabari glacier and the eruption of the Mandakini river?

(a) 2012

(b) 2014

(c) 2013

(d) 2015

Q11. How many times on an average does an adult human being at rest breathe in and out in a minute?

(a) 12-15 times

(b) 18-21 times

(c) 15-18 times

(d) 20-23 times

Q12. Energy Swaraj Yatra Bus has been designed and developed by Dr. Chetan Singh Solanki, who is a professor of_____, which plans to combine synergies of climate change mitigation efforts.

(a) IIT Madras

(b) IIT Bombay

(c) IIT Delhi

(d) IIT Kharagpur

Q13. A statement is given followed by two possible conclusions numbered I and II. You have to assume everything in the statement to be true and on the basis of it, decide which of the conclusions logically follow(s).

Statement:

"I want to start my own business of exporting cashews and hazelnuts to Turkey and America because I have many friends in these countries with similar business interests, which I think will be helpful." - A told B.

Conclusions:

I. It's always beneficial to have good contacts in the domains of work.

II. B is not interested in doing business with A.

(a) Both the conclusions follow

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(b) Only conclusion II follows
(c) Only conclusion I follows
(d) Neither conclusion follows

Q14. If (32/243)^k = 8/27, then k =_____.
(a) 3/5
(b) 5/3
(c) 3/2
(d) 2/3

Q15. 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/subtracting/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 1s not allowed.)
(13, 84, 8)
(21, 136, 13)
(a) (14, 56, 8)
(b) (16, 23, 156)
(c) (8, 71, 19)
(d) (27, 140, 8)

Q16. The ratio of A's salary to B's salary is 4 : 5. The ratio of B's salary to C's salary is 3 : 4. Find the ratio of A's salary to C's salary.
(a) 4 : 3
(b) 4 : 5
(c) 3 : 5
(d) 5 : 4

Q17. Which of the following elements is NOT present as a diatomic molecule in nature?
(a) Nitrogen
(b) Helium
(c) Chlorine
(d) Hydrogen

Q18. Rani is elder to Rosy by 1 year, and Rosy is elder to Rimmy by 1 year. The sum of their ages is 48 years. What is Rosy's age?
(a) 17 years
(b) 21 years
(c) 15 years
(d) 16 years

Q19. Simplify $(3x + 4)^2 + (3x - 4)^2 + (3x + 4)(3x - 4)$.
(a) $27x^2 - 16$
(b) $27x^2 + 16$
(c) $27x^2 + 48x + 32$
(d) $27x^2 - 24x + 16$

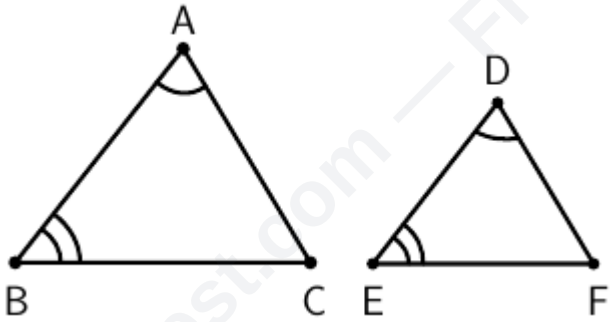
Q20. Naphthalene balls used to repel moths and other insects are obtained from:
(a) coke
(b) coal gas
(c) coal tar
(d) coal

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Q21. Vaishnavi starts walking towards the south. She walks 10 m, turns right and walks 5 m. she then turns right and walks for 3 m. Next, she again turns right and walks 10 m. Again, she takes a right and walks 8 m. Finally, she again turns right and walks 6 m. In which direction is she facing now? (All turns are 90 degree turns only)

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

Q22. In the given figure, ΔABC is similar to ΔDEF; if AB = 6.5 cm, DE = 3.9 cm, and BC = 5.15 cm, find EF.



(a) 3.90 cm
(b) 3.09 cm
(c) 4.12 cm
(d) 3.00 cm

Q23. Which of the following terms will replace the question mark (?) in the given series to make it logically complete?

SKC33, OGY39, KCU45, GYQ51,?

(a) MCN55
(b) CUM57
(c) CUM59
(d) MCN57

Q24. If means '–' means '×', '×' means '+', '+' means '÷', '÷' means '-', what will come in place of the question mark (?) in the following equation?

5 – 5 ÷ 6 × 6 + 3 = ?

(a) 21
(b) 35
(c) 22
(d) 32

Q25. In this question, a group of numbers/symbols is coded using letters as per the table given below and the conditions which follow. The correct combination of codes following the conditions is your answer.

numbers/ Symbol	**6**	**8**	**4**	**•**	**5**	**#**	**%**	**2**	**$**	**1**	**^**	**7**	**9**	**•**	**@**
Code	S	U	T	W	N	P	V	D	A	Z	J	M	O	M	Y

Conditions:

(i) If the first and last elements are numbers, then the last element will be replaced by the symbol @.

(ii) If the first element is a symbol, then the first element will be coded as ©.

(iii) If both the first and second elements are numbers, then the third element will be coded as *.

What will be the code for the following?

5 6 * @ %

(a) VYSNM

(b) YVMNS
(c) NS*YV
(d) NSMVY

Q26. Select the correct property/properties from among the following, with respect to the reflection of light by a concave mirror.

(a) Light does not obey the laws of reflection as the concave surface is a curved surface.

(b) A light ray directed onto the pole of a concave mirror retraces the path of incidence in the opposite direction.

(a) Both (a) and (b) are incorrect
(b) Both (a) and (b) are correct
(c) Only (b) is correct
(d) Only (a) is correct

Q27. If '+' means '÷', '-' means '×', '×' means '+', and '÷' means '-', what will come in place of the question mark (?) in the following equation?

45 + 9 – 4 × 15 ÷ 2 = ?

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

Q28. Find the median of the given frequency distribution.

Class Interval	0-10	10-20	20-30	30-40	40-50
f	8	7	9	12	11

(a) 265/9
(b) 215/9
(c) 85/3
(d) 88/3

Q29. _____ is an Islamic finance term referring to the obligation that an individual has to donate a certain proportion of wealth each year to charitable causes.

(a) Mudarabah
(b) Zakat
(c) Ijarah
(d) Musharakah

Q30. Which of the following solutions will turn pH paper blue?

(a) Lemon juice
(b) Gastric juice
(c) Sodium hydroxide
(d) Hydrochloric acid

Q31. Five boxes numbered 36, 74, 27, 51 and 92 are kept one above the other, not necessarily in the same order. Box 51 is on the topmost position. Only box 92 is between box 74 and box 36. Only one box is above box 27. Box 36 is not at the bottom most position. Which box is kept in the exact middle position?

(a) Box 74
(b) Box 92
(c) Box 36
(d) Box 27

Q32. Find the sum of the roots of the quadratic equation $x^2 + 19x + 60 = 0$.

(a) -19/60
(b) 1/19
(c) -19

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(d) 19

Q33. How many 7s are there in the following sequence which is immediately followed by 1 and immediately preceded by 5?

2 7 3 5 7 1 5 7 3 5 7 1 9 7 3 5 7 1 7 3 6 5 7 1 8 1 4 7 3 5

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

Q34. The value of $([(0.68)^2+(0.32)^2+16\times 0.0136])/([(0.68)^3-(0.32)^3]\div (0.3)^2)$ is:

(a) 1/2
(b) 1/4
(c) 3/5
(d) 3/8

Q35. Which of the following options is NOT a function of Gram Panchayats?

(a) Scrutinises and approves budgets of the Block Samities
(b) Management of local public resources
(c) Development of village facilities
(d) Collection of local taxes

Q36. The value of resistance gets doubled if its length is _____ (keeping other parameters constant).

(a) doubled
(b) halved
(c) unaltered
(d) squared

Q37. Which of the options below gives a pair of co-prime numbers?

(a) (156, 234)
(b) (161, 192)
(c) (196, 343)
(d) (228, 247)

Q38. Which of the following is primarily responsible for the movement of the human body?

(a) Combination of nervous and connective tissues
(b) Combination of nervous and epithelial tissues
(c) Combination of muscular and connective tissues
(d) Combination of nervous and muscular tissues

Q39. Which of the following states first receives the rain from the southwest monsoon?

(a) West Bengal
(b) Kerala
(c) Rajasthan
(d) Himachal Pradesh

Q40. 'The official language of the Union shall be Hindi in Devanagari script' is prescribed in which Article of the Indian Constitution?

(a) Article 345
(b) Article 342
(c) Article 344
(d) Article 343

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Q41. In Economics, 'multiplier' is defined as the ratio of increase in income to increase in _____.

(a) liability
(b) debt
(c) investment
(d) credit

Q42. Double displacement reaction takes place with:

(i) Precipitates are formed.
(ii) Evolution of a gas
(iii) Change in colour.

(a) i, ii and iii
(b) Only iii and i
(c) Only i and ii
(d) Only iii

Q43. Three statements are given followed by two conclusions numbered I and II. You have to take the statements to be true, even if they seem to be at variance with commonly known facts and decide which of the conclusions logically follow(s) from the statements.

Statements:
All Pages are Books.
All Books are Catalogues.
Some Catalogues are Designs.
Conclusions:
(I) Some Books are Designs.
(II) All Pages are Catalogues.

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

Q44. In the following table., where would a broken plastic bucket be placed?

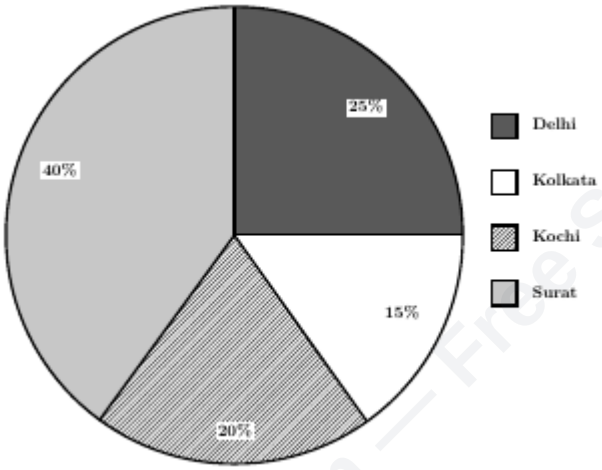
	Safely combustible	**Not safely combustible**
Recyclable	A	B
Non- Recyclable	C	D

(a) Cell A or B
(b) Cell A or C
(c) Cell B or D
(d) Cell C or D

Q45. Study the given pie-chart and answer the following question.

The given pie chart depicts the number of cars sold in four cities. The total number of cars sold in the given four cities together is 80.

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In Delhi, the respective ratio between the number of cars sold to female and male customers is 2 : 3. What is the number of cars sold to female customers in Delhi?

(a) 4
(b) 8
(c) 6
(d) 12

Q46. A statement is followed by two conclusions. Find out which conclusion is true based on the given statement.

Statement:

L > M ≥ 2 > N > O = P ≤ Q < R

Conclusions:

I.O < R

II. M > Q

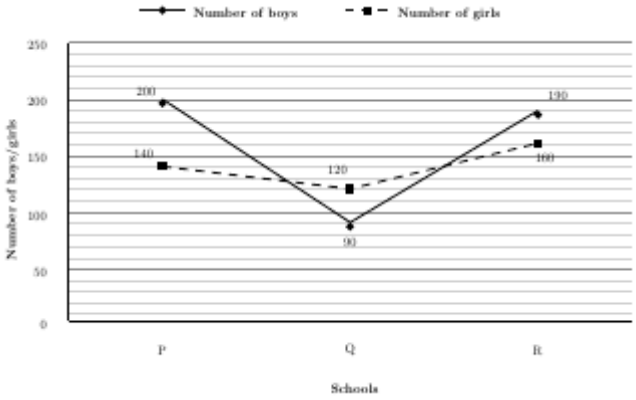
(a) Either conclusion I or II is true
(b) Both conclusions I and II are true
(c) Only conclusion I is true
(d) Only conclusion II is true

Q47. Gandhi Jayanti is an event held in India to commemorate Mahatma Gandhi's birthday in the month of _____.

(a) September
(b) November
(c) December
(d) October

Q48. Study the given line graph and answer the following question.

The given line graph depicts the number of boys and girls in three schools (P Q and R).



What is the average number of boys in the given three schools?

(a) 160

(b) 170
(c) 150
(d) 140

Q49. Mani starts from Point A and drives 5 km towards the west. He then takes a right turn, drives 8 km, turns right and drives 13 km. He then takes a right turn and drives 19 km, takes a left turn and drives 4 km. He then takes left turn and drives 11 km and stops at Point B. How far and towards which direction should he drive in order to reach Point A from Point B? (All turns are 90 degree turns only)

(a) 6 km towards the east
(b) 8 km towards the south
(c) 9 km towards the south
(d) 12 km towards the west

Q50. The LCM and the HCF of two numbers are 5005 and 77, respectively. When one of the two numbers is divided by 55, the quotient is 18 and the remainder is 11. The other number is:

(a) 330
(b) 385
(c) 418
(d) 440

Q51. The diameter of a wheel is 63 cm. What is the distance covered by the wheel by making 100 revolutions? [Use π = 22/7]

(a) 28 m
(b) 99 m
(c) 198 m
(d) 396 m

Q52. The induced current is _____ when the direction of the motion of the coil is at right angles to the magnetic field.

(a) Zero
(b) Infinity
(c) Minimum
(d) Maximum

Q53. Which of the following numbers will replace the question mark (?) in the given series?

4, 9.6, 23.04, ?, 132.7104, 318.50496

(a) 58.269
(b) 60.913
(c) 51.865
(d) 55.296

Q54. If light enters from air to some medium A having a refractive index of 1.33, then what is the speed of light in the medium A?

(a) 2.26 × 108 m/s
(b) 1.97 × 108 m/s
(c) 1.67 × 108 m/s
(d) 2.67 × 108 m/s

Q55. A can complete 33 1/3 % of a piece of work in 10 days and B can complete one-fourth of the same work in 30 days. A, B and C together can complete the same work in 12 days. In how many days will the work be completed if A works on all days, and is assisted by B and C on alternate days, starting with B assisting A on the first day?

(a) 17 3/13
(b) 17 1/3
(c) 18 2/3
(d) 18 4/13

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Q56. In this question, the statement is followed by four conclusions. Find out which conclusion is true based on the given statement:

Statement:

$K \geq U = N > Q < R = T \leq P$

(a) T < R
(b) Q > U
(c) K = N
(d) K > Q

Q57. Which of the following is NOT a key feature of the Constitution of India?

(a) Fundamental rights
(b) Parliamentary form of government
(c) Establishment of federalism
(d) Promotion of feudalism

Q58. Girls should take special care with respect to health and hygiene during the time of menstrual flow to avoid infections and ill health. Which of the following statements in this regard is FALSE?

(a) Girls should consume chips and packed or tinned snacks to meet nutritional needs.
(b) Girls should use sanitary napkins or clean homemade pads.
(c) Girls should keep track of their menstrual cycle and be prepared for the onset of menstruation.
(d) Girls should change pads after every 4-5 hours or as per the requirement.

Q59. Which of the following transports products of photosynthesis from the leaves to the other parts of the plant?

(a) Sclerenchyma
(b) Phloem
(c) Xylem
(d) Collenchyma

Q60. Ten years later, Ramesh will be twice as old as Rajiv and five years ago Ramesh was three times as old as Rajiv. Find the present age (in years) of Ramesh.

(a) 50
(b) 40
(c) 60
(d) 20

Q61. If a copper wire is moving through a uniform magnetic field, then the direction of the induced current can be found using the:

(a) Fleming's right hand rule
(b) Maxwell's right hand screw rule
(c) Maxwell's left hand screw rule
(d) Fleming's left hand rule

Q62. In February 2022, which of the following became the 1^(st) state in the country to launch night navigation mobile app in rivers?

(a) Himachal Pradesh
(b) Assam
(c) Haryana
(d) Jharkhand

Q63. A solid right cylinder having a base of diameter 10 cm and height 2 cm is melted and recast into right cylindrical coins with a base diameter of 1 cm and a 0.2 cm thickness. Find the number of coins that can be made.

(a) 1001
(b) 1000
(c) 10,000
(d) 100

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Q64. Which of the following is a Leadership Development Programme for Minority Women in India?

(a) Nai Manzil
(b) Naya Ujala
(c) Nai Roshni
(d) Naya Savera

Q65. At what time between 2:30 p.m. and 3:30 p.m. will the hands of a clock be together?

(a) 14 + 16/11
(b) 14 + 6/11
(c) 16 + 4/11
(d) 11 + 4/16

Q66. Which elements show similar valency as that of silicon?

(a) Na and H
(b) Mg and K
(c) C and Ge
(d) Cl and Br

Q67. A light ray is travelling from air medium to water medium (refractive index = 1.3) such that angle of incidence is x degree and angle of refraction is y degree. The value of ratio (sin y) / (sin x) is:

(a) 1/1.3
(b) 1
(c) 1.3
(d) 0.3

Q68. Resistors of 0.2 Ω, 0.4 Ω, 0.6 Ω, 0.8 Ω are connected in series across a voltage of 20 V. What is the net power of the electric circuit?

(a) 800 Watt
(b) 20 J/s
(c) 200 Watt
(d) 80 J/s

Q69. Who is the first captain in cricketing history to wins 13 consecutive T 20 I matches?

(a) Virat Kohli
(b) Rohit Sharma
(c) Babar Azam
(d) Mahendra Singh Dhoni

Q70. Which of the following numbers will replace the question mark (?) in the given series?

2, 3, 4, 9, 6, 27, 8, 81, 10, ?

(a) 243
(b) 333
(c) 183
(d) 111

Q71. If the median and the mode of a set of data are 12 and 15, respectively, then find the value of thrice the mean of the same data set.

(a) 33/2
(b) 63/2
(c) 23/2
(d) 35/2

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Q72. G, H, I, J, K and L are six friends sitting around a circular table facing the centre of the table discussing the outcome of a cricket match. I is an immediate neighbour of both L and J. K is not the immediate neighbour of J. H is seated second to the left of L. Which of the following options represents I's position from G?

(a) Second to the left.
(b) Immediate right.
(c) Second to the right.
(d) Third to the left.

Q73. Magnification produced by a spherical mirror is equal to:

(a) height of an image - height of an object
(b) (height of an image)/(height of an object)
(c) height of an object - height of an image
(d) (height of an object)/(height of an image)

Q74. Select the option that is related to the third term in the same way as the second term is related to the first term and the Sixth term is related to the fifth term.

231 : 334 :: 289 : ? :: 319 : 422

(a) 395
(b) 394
(c) 393
(d) 392

Q75. Study the given number series and answer the question that follows.

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

How many such odd numbers are there each of which is immediately preceded by an even number and also immediately followed by an even number?

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

Q76. The selling price of a sewing machine is Rs. 19,440. If it was sold at 8% profit, find its cost price.

(a) Rs. 20,559.20
(b) Rs. 17,595.20
(c) Rs. 18,000.00
(d) Rs. 16,000.00

Q77. The Sone river belongs to which river system?

(a) Ganga
(b) Mahanadi
(c) Narmada
(d) Godavari

Q78. Find the single percentage discount equivalent to three successive discounts of 30%, 20% and 10% respectively.

(a) 50.4%
(b) 49.6%
(c) 46.4%
(d) 64.6%

Q79. Plant root cells also need oxygen to generate energy. So roots take up air from:

(a) stomata
(b) water
(c) air spaces between soil particles
(d) cytoplasm

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Q80. Girish Chandra Murmu held the post of _____ as on 31 March 2022.

(a) Solicitor General of India
(b) Attorney General of India
(c) Chief Election Commissioner of India
(d) Comptroller and Auditor General of India

Q81. Three statements are given followed by two conclusions numbered I and II. You have to take the statements to be true, even if they seem to be at variance with commonly known facts and decide which of the conclusions logically follow(s) from the statements.

Statements:

Some Rings are Ears.

Some Rings are Fingers.

All Ears are Noses.

Conclusions:

(I) All Rings are Noses.

(II) Some Fingers are Ears.

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

Q82. In a triangle ABC, which of the following statements is correct?

(a) Side AB + Side BC > Side AC
(b) Side AB + Side BC < Side AC
(c) Side AB + Side BC = Side AC
(d) Side AB + Side BC ≥ Side AC

Q83. The _____ assesses the prospects of the economy with respect to the GDP growth rate, fiscal balance of the central government and external balance.

(a) Medium-term Fiscal Policy Statement
(b) Revenue Expenditure
(c) Macroeconomic Framework Statement
(d) Fiscal Policy Strategy Statement

Q84. A battery of 12V supplies a current of 3 A to a lamp connected to it. The energy supplied to it in 15 minutes will be:

(a) 32150 J
(b) 540 J
(c) 32000 J
(d) 32400 J

Q85. Three statements are given followed by two conclusions numbered I and II. You have to take the statements to be true, even if they seem to be at variance with commonly known facts and decide which of the conclusions logically follow(s) from the statements.

Statements:

Some Waters are Stagnant.

Some Waters are Rivers.

All Stagnant are Mosquitoes

Concussions:

(I) Some Waters are Mosquitoes.

(II) Some Rivers are Stagnant.

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

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(d) Only conclusion (II) follows.

Q86. In a class test, a certain number of students got different ranks based on their marks. Anshu is ranked 19^(th) from the top. 6 students are ranked after Anshu. How many total students gave the test?

(a) 37
(b) 31
(c) 25
(d) 26

Q87. In 0.0216216... is written as a fraction in lowest terms, then what is the difference between the denominator and the numerator of the fraction?

(a) 181
(b) 179
(c) 183
(d) 187

Q88. [{(9261)^(1/3) ÷ 81^(1/4)}² × 4√1296] equals:

(a) 147
(b) 294
(c) 174
(d) 249

Q89. Which football club clinched the I-League title in 2022?

(a) Gokulam Kerala FC
(b) Mohammedan Sporting
(c) Rajasthan FC
(d) RoundGlass Punjab

Q90. Identify the institute from the given description.

'The institute was founded on 1 June 1945 with support from the Sir Dorabji Tata Trust. The institute first began functioning within the Cosmic Ray Research Unit on the campus of the Indian Institute of Science, Bangalore and moved to Bombay in October that year.'

(a) Shavak Nanavati Technical Institute (SNTI)
(b) National Institute of Advance Sciences (NIAS)
(c) Tata Institute of Fundamental Research (TIFR)
(d) Tata Institute of Social Science (TISS)

Q91. R, S, T, U, V and W live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it is numbered 2 and so on till the topmost floor is numbered 6. Only two people between T and W. T does not live on the topmost floor. Neither U nor V lives on the lowermost floor. Only one person lives above S. U lives immediately below T and immediately above V. Who lives on floor number 2?

(a) V
(b) T
(c) S
(d) U

Q92. A can complete a piece of work alone in 10 days and B can complete the same piece of work alone in 15 days. Working together, A, B and C can complete this work in 4 1/2 ; days. If B does not work, while A and C work on alternate days, starting with C, then in how many days will the work be completed?

(a) 13
(b) 13 1/9
(c) 13 2/3
(d) 13 1/5

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Q93. Study the given chemical reaction and find the values of x, y and z, respectively.

$xFe(s) + yH_2O(g) \rightarrow Fe_3O_4 + zH_2(g)$

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

Q94. The element 'x' in the modern periodic table has an electronic configuration 2, 8, 8. The element 'x' is placed in the _____.

(a) 18th group
(b) 6th group
(c) 8th group
(d) None of the above

Q95. Which of the following statements is FALSE?

(a) Each gene controls one character.
(b) The two alleles are brought together at the time of gamete formation
(c) Every germ cell will take one chromosome from each pair.
(d) Genes are located on chromosomes.

Q96. What will come in the place of the question mark (?) in the following equation, if '+' and '-' are interchanged and also '×' and '÷' are interchanged?

$15 \div 3 - 10 \times 2 \div 18 \times 6 - 4 = ?$

(a) 60
(b) 62
(c) 64
(d) 61

Q97. $\sin^6\theta + \cos^6\theta$ can be simplified as:

(a) $1 + 3\sin^2\theta\cos^2\theta$
(b) $1 - \sin^2\theta\cos^2\theta$
(c) $1 - 3\sin^2\theta\cos^2\theta$
(d) $1 + \sin^2\theta\cos^2\theta$

Q98. Which one of the following is NOT one of the objectives of 'Beti Bachao Beti Padhao' initiative?

(a) Cash transfer through DBT at the time of marriage of beneficiary girl
(b) Ensuring survival & protection of the girl child
(c) Ensuring education and participation of the girl child
(d) Prevention of gender biased sex selective elimination

Q99. A student takes a ribbon and burns it in the presence of oxygen. It changes into magnesium oxide. Which process has occurred?

(a) Hydrogenation
(b) Oxidation
(c) Decomposition
(d) Reduction

Q100. Study the given letter series and answer the question that follows.

(Left) H A D W V Q T S P E R S T K E L M T (Right)

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

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

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) 5%

Shortcut Trick

For Compound Interest over 2 years, the ratio of Amount (A) to Principal (P) is the square of the multiplier (1 + R/100).

Ratio A/P = 11025 ÷ 10000 = 441 ÷ 400

For 1 year, multiplier = √(441 ÷ 400) = 21 ÷ 20

Interest on 1 unit = 21 − 20 = 1 unit

Rate % = (1 ÷ 20) × 100% = 5%

Therefore The correct answer is 5%.

Alternate Method

Given:

Principal (P) = Rs. 10,000

Amount (A) = Rs. 11,025

Time (n) = 2 years

Formula Used:

$A = P(1 + R/100)^n$

Calculations:

$\Rightarrow 11025 = 10000(1 + R/100)^2$

$\Rightarrow 11025 \div 10000 = (1 + R/100)^2$

$\Rightarrow 1.1025 = (1 + R/100)^2$

$\Rightarrow \sqrt{1.1025} = 1 + R/100$

$\Rightarrow 1.05 = 1 + R/100$

$\Rightarrow R/100 = 1.05 - 1$

$\Rightarrow R/100 = 0.05$

$\Rightarrow R = 0.05 \times 100 = 5\%$

Therefore The correct answer is 5%.

Additional Information

Effective Rate of Interest

For a rate R% compounded annually for 2 years, the effective rate is given by R + R + (R × R) ÷ 100.

CI and SI Difference

The difference between Compound Interest and Simple Interest for 2 years is $D = P \times (R \div 100)^2$.

Rule of 72

To find the approximate time required to double an investment, divide 72 by the annual rate of interest ($n \approx 72 \div R$).

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Q2. Answer: (b) RDQWC

According to english alphabet series

The pattern followed here is :

'SOLVE' is coded as 'QRJYC'

Similarly,

FENCE' is coded as 'DHLFC'

'TASTE' is coded as 'RDQWC'

Hence, the correct answer is "Option 2"

Q3. Answer: (c) YTREWOP

The pattern followed here is :

NALAYAK : KAYALAN

And,

BEAUTY : YTUAEB

Similarly,

POWERTY : YTREWOP

Hence, the correct answer is "Option 3"

Q4. Answer: (d) Second to the right of B

Five girls, A, B, C, D, and E are sitting around a circular table facing the centre.

• D is second to the right of E.

• C is an immediate neighbour of D and B.

• E is the immediate neighbour of A and B.

A is seated Second to the right of B.

Hence, the correct answer is "Option 4"

Q5. Answer: (c) Rs. 3,00,000

The correct answer is Rs. 3,00,000.

Key Points

• A microfinance loan is defined as a collateral-free loan granted to a household with an annual household income of up to Rs. 3,00,000 in accordance with Reserve Bank of India (Regulatory Framework for Microfinance Loans) Directions, 2022.

• The term *"household"* in this context refers to a single family unit, consisting of a husband, wife, and any unmarried children.

Additional Information

• All collateral-free loans supplied to low-income households, defined as households with annual incomes up to Rs. 3,00,000, will be regarded as microfinance loans, regardless of end use and manner of application, processing, or disbursal (either through physical or digital channels).

• The loan cannot be secured by a lien on the borrower's deposit account in order to maintain the microfinance loan's collateral-free status.

• The REs must have a board-approved policy that allows them to customize the repayment schedule for micro-loans to meet the needs of the borrowers.

Q6. Answer: (b) $(x + 2)(x + 2)(x - 1) = x^3 + 5x^2 + 6x + 4$

Shortcut Trick

To identify a quadratic equation, simplify both sides and check if the highest power (degree) of the variable is exactly 2.

In options (1), (3), and (4), the x^2 terms on both sides have the same coefficient and will cancel out, leaving linear equations.

In option (2), the cubic terms (x^3) cancel out, but the quadratic terms (x^2) do not, resulting in a degree of 2.

Therefore The correct answer is $(x + 2)(x + 2)(x - 1) = x^3 + 5x^2 + 6x + 4$.

Alternate Method

Given: Equation $(x + 2)(x + 2)(x - 1) = x^3 + 5x^2 + 6x + 4$

Formula: A quadratic equation is of the form $ax^2 + bx + c = 0$, where $a \neq 0$.

$\Rightarrow (x + 2)^2(x - 1) = x^3 + 5x^2 + 6x + 4$

$\Rightarrow (x^2 + 4x + 4)(x - 1) = x^3 + 5x^2 + 6x + 4$

$\Rightarrow x(x^2 + 4x + 4) - 1(x^2 + 4x + 4) = x^3 + 5x^2 + 6x + 4$

$\Rightarrow x^3 + 4x^2 + 4x - x^2 - 4x - 4 = x^3 + 5x^2 + 6x + 4$

=> $x^3 + 3x^2 - 4 = x^3 + 5x^2 + 6x + 4$

=> $3x^2 - 4 = 5x^2 + 6x + 4$ (Subtracting x^3 from both sides)

=> $2x^2 + 6x + 8 = 0$

Since the degree of the simplified equation is 2, it is a quadratic equation.

Therefore The correct answer is $(x + 2)(x + 2)(x - 1) = x^3 + 5x^2 + 6x + 4$.

Additional Information

Standard Form

A quadratic equation in the variable x is an equation of the form $ax^2 + bx + c = 0$, where a, b, c are real numbers and $a \neq 0$.

Degree of Polynomials

The degree is the highest power of the variable. Degree 1 is linear, degree 2 is quadratic, and degree 3 is cubic.

Roots of Quadratic Equation

A quadratic equation can have at most two real roots, determined by the discriminant $D = b^2 - 4ac$.

Q7. Answer: (a) 6.50

Shortcut Trick

Initial amounts of Ram and Shyam are Rs. 4 and Rs. 7 respectively.

Initial difference = 7 − 4 = 3 units.

Final ratio = 7 : 9. Final difference = 9 − 7 = 2 units.

Since an equal amount is added, the difference remains constant. Multiply initial values by 2 and final ratio by 3.

New Initial: 8 and 14 | New Final: 21 and 27. Amount added = 21 − 8 = 13 units.

Since we doubled the initial values, 1 unit here corresponds to Rs. 0.50. Added amount = 13 × 0.5 = Rs. 6.50.

Therefore The correct answer is Rs. 6.50.

Alternate Method

Given: Initial amount of Ram = Rs. 4, Initial amount of Shyam = Rs. 7. Final ratio = 7 : 9.

Formula Used: Ratio = (Initial Value + Addition) ÷ (Initial Value + Addition)

Let the equal amount given by Jatin be x.

=> $(4 + x) / (7 + x) = 7 / 9$

=> $9 \times (4 + x) = 7 \times (7 + x)$

=> $36 + 9x = 49 + 7x$

=> $9x - 7x = 49 - 36$

=> $2x = 13$

=> $x = 13 / 2$

=> $x = 6.5$

Therefore The correct answer is Rs. 6.50.

Additional Information

Ratio and Proportion Property

When an equal amount is added to or subtracted from both terms of a ratio, the absolute difference between the terms remains unchanged.

Cross-Multiplication Method

For $a/b = c/d$, the property $ad = bc$ is used to find an unknown variable in linear equations involving fractions.

Q8. Answer: (d) Jawaharlal Nehru

The correct answer is Jawaharlal Nehru.

Key Points

• Under Jawaharlal Nehru's leadership, Subhash Chandra Bose founded the National Planning Committee in 1938.

• National Planning Committee

• The intention of the National Planning Committee was to create an economic strategy with the primary objective of guaranteeing an adequate standard of living for the population.

• A fifteen-member National Planning Committee was then established, with the Committee emphasizing in a memo that national independence is a crucial precondition for adopting any actions that may be discovered to be required for implementing the plan in all of its varied components.

• Near the end of 1938, nine years before independence, the Indian National Congress established a National Planning Committee to emphasize the significance of social and economic goals as well as the necessity of learning from other nations'

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experiences with planned development through national plans.

Additional Information

• Maulana Abul Kalam Azad

• Abul Kalam Ghulam Muhiyuddin Ahmed bin Khairuddin Al-Hussaini Azad was a senior member of the Indian National Congress, an Islamic theologian, and a supporter of Indian independence. He lived from 11 November 1888 until 22 February 1958.

• Lal Bahadur Shastri

• Indian politician and leader Lal Bahadur Shastri was born on October 2, 1904, and passed away on January 11, 1966. Between 1961 and 1963, he served as India's sixth home minister and as the country's second prime minister between 1964 and 1966.

• Sardar Vallabhbhai Patel

• Vallabhbhai Jhaverbhai Patel, better known by his stage name Sardar Patel, was an Indian lawyer, prominent political figure, and politician who lived from October 31, 1875, to December 15, 1950. From 1947 until 1950, he was India's first deputy prime minister and home minister.

Q9. Answer: (c) 1/2

The correct answer is 1/2.

Key Points

• The set quantity of water molecules found in one salt formula unit constitutes the water of crystallisation.

• CaSO4. 1/2 H2O is the plaster of Paris's chemical formula.

• As a result, one plaster of Paris molecule contains 1/2 water for crystallisation.

• It is also known as calcium sulphate hemihydrate for this reason.

Additional Information

• No water of crystallisation remains at 393 K, and anhydrous calcium sulphate, CaSO4, is created instead.

• This is referred to as "dead burned plaster."

• Uses

• Plaster of Paris is mostly used in the building sector, along with plasters.

• When a bone is broken or sprained, it is used to immobilise the damaged area of the organ.

• Additionally, it is used in dentistry, decorative arts, and the casting of statues and busts.

Q10. Answer: (c) 2013

The correct answer is 2013.

Key Points

• In 2013, the state of Uttarakhand saw unusually heavy rain from June 13 to June 17.

• As a result, the Mandakini river erupted and the Chorabari glacier began to melt.

• Large portions of Western Nepal, Himachal Pradesh, and Uttarakhand were also hit by the floods.

Additional Information

• One such glacier is India's Chorabari Glacier, which feeds important rivers like the Ganges.

• This glacier, which is located between the village of Kedarnath and the Kedarnath mountain to the north and south, creates a ferocious stream that finally joins the Ganges River.

• At Rudraprayag, the river Mandakini, which is the most significant river flowing from the Kedarnath peak's slopes, joins the Alaknanda.

• Actually, the Chorabari Glacier's snowmelt feeds the river's springs, which are located around one mile above Kedarnath Temple.

Q11. Answer: (c) 15-18 times

The correct answer is 15-18 times.

Key Points

• An adult human breathes 15 to 18 times per minute on average while at rest. However, the rate of breathing might vary depending on the circumstances.

• When we are working, we breathe more quickly. As a result, the cells can receive enough oxygen as the breathing rate increases with the intensity of the task.

• Approximately 12 to 16 breaths per minute are taken by a healthy adult, according to the University of Rochester Medical Center.

• Children breathe more quickly than adults. An infant, for instance, breathes between 30 and 60 times per minute, while a school-age youngster breathes between 18 and 30 times per minute.

Additional Information

• Respiratory rates:

• The respiratory rate of a person in a resting posture is the same as their resting respiratory rate, which is 15–18 breaths per minute.

• Here, sleeping is the position that leaves you feeling the most rested, whereas watching TV only necessitates a few more breaths.

• While engaging in vigorous physical activity, the respiratory rate rises.

• A brisk walk necessitates moving quickly, which results in a strenuous physical workout and increased respiratory rate.

• Cycling, on the other hand, calls for the use of more muscles than brisk walking does, which raises the respiratory rate needed to give the extra oxygen needed while cycling.

Q12. Answer: (b) IIT Bombay

The correct answer is IIT Bombay.

Key Points

• The Union Minister of Education travelled from his home to his workplace on the Energy Swaraj Yatra Bus.

• The bus is outfitted with solar power and is fully functional as both a work and living space.

• The IIT Bombay professor who designed and built the bus, Dr Chetan Singh Solanki, is with the Minister.

Additional Information

• Chetan Singh Solanki is a researcher, educator, innovator, and instructor for the Art of Living's happiness programme.

• The concept of the "Energy Swaraj Yatra" is based on "Gandhian beliefs" in order to combat climate change and maintain the sustainability of the energy supply.

• Due to the emergency status of climate change, public measures are now needed to reduce it.

• The goal of the Energy Swaraj Movement is to raise public knowledge of the issue of climate change and encourage participation in its solution.

Q13. Answer: (c) Only conclusion I follows

According to the given statement

Conclusion I follow this because it provides a suitable explanation for the given statement. (Because it is mentioned that, A has many friends with similar business interest.)

Conclusion II does not follow because nothing about the interest of B is given.

Only conclusion I follow

Hence, the correct answer is "Option 3"

Q14. Answer: (a) 3/5

Calculation:

Here, we have (32/243)^k = 8/27

As, we can write 32 as 2^5, 243 = 3^5

Also $8 = 2^3$ and $27 = 3^3$

=> $(2/3)^{(5k)} = (2/3)^3$

=> 5k = 3

=> k = 3/5

Hence, the required value of k is 3/5.

Q15. Answer: (d) (27, 140, 8)

The logic followed in the given sets is:

(First term + Third term) × 4 = Second term

Now we apply the pattern on the given sets:

(13, 84, 8)

(13 + 8) × 4 = 84

21 × 4 = 84

84 = 84

(21, 136, 13)

(21 + 13) × 4 =136

34 × 4 = 136

136 = 136

Now we apply the pattern on the given options:
Option 1) (14, 56, 8)
(14 + 8) × 4 = 56
22 × 4 = 56
88 ≠ 56
Option 2) (16, 23, 156)
(16 + 156) × 4 = 23
172 × 4 = 23
688 ≠ 23
Option 3) (8, 71, 19)
(8 + 19) × 4 = 71
27 × 4 = 71
108 ≠ 71
Option 4) (27, 140, 8)
(27 + 8) × 4 = 140
35 × 4 = 140
140 = 140
Hence, the correct answer is Option 4.

Q16. Answer: (c) 3 : 5

Shortcut Trick
To find the ratio of the first term (A) to the last term (C), multiply the intermediate ratios directly.
Ratio A : C = (A ÷ B) × (B ÷ C)
=> A ÷ C = (4 ÷ 5) × (3 ÷ 4) = 3 ÷ 5
Therefore The correct answer is 3 : 5.
Alternate Method
Given:
Ratio of A's salary to B's salary = 4 : 5
Ratio of B's salary to C's salary = 3 : 4
A : B = 4 : 5
B : C = 3 : 4
Common B
Combine via LCM of B (5 × 3 = 15)
To find the combined ratio, equalize the value of B in both ratios:
=> A : B = 4 : 5 = (4 × 3) : (5 × 3) = 12 : 15
=> B : C = 3 : 4 = (3 × 5) : (4 × 5) = 15 : 20
=> Combined Ratio A : B : C = 12 : 15 : 20
=> Ratio of A : C = 12 : 20
=> Simplifying by dividing by 4: 3 : 5
Therefore The correct answer is 3 : 5.
Additional Information
Compounded Ratio
When two or more ratios are multiplied together, the result is called a compounded ratio. For a : b and c : d, it is (ac) : (bd).
Equating Ratios
To link two ratios with a common term, find the LCM of the common term's values in both ratios and adjust accordingly.
Duplicate Ratio
The duplicate ratio of a : b is $a^2 : b^2$, and the triplicate ratio is $a^3 : b^3$.

Q17. Answer: (b) Helium

The correct answer is Helium.
Key Points
• Hydrogen is regarded as diatomic because it has two hydrogen atoms in its molecule, but helium is considered monoatomic

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since it has one atom in its molecule.

• Due to its totally filled valency shell structure, helium has no chemical affinity. Helium cannot form a diatomic molecule.

• Since helium belongs to noble gases, it has an electron-filled outer shell.

• Helium (He) is an inert gas and a chemical element belonging to Periodic Table Group 18 (noble gases).

Additional Information

• Monatomic gas

• Monatomic is a compound word made up of the letters "mono" and "atomic," which stand for a single atom. This phrase refers to the gases as monatomic gases and is used in both physics and chemistry.

• Due to their lack of reactivity, noble gases are considered monatomic gases.

• Examples of monatomic gases: Helium (He), Radon (Rn), Neon (Ne), Xenon (Xe), Argon (Ar) and Krypton (Kr).

• Diatomic molecules

• Diatomic molecules are ones that have just two atoms in them. A diatomic molecule is referred to as homonuclear if it is made of only one element, and as heteronuclear if it is made of two separate elements.

• Examples of Diatomic molecules: Hydrogen (H 2), Nitrogen (N 2), Fluorine (F 2), Oxygen (O 2), Iodine (I 2), Chlorine (Cl 2) and Bromine (Br 2).

Q18. Answer: (d) 16 years

Shortcut Trick

Since the ages of Rimmy, Rosy, and Rani are in an arithmetic progression (difference of 1 year each), the average age is exactly the middle person's age.

Total persons = 3 (Rimmy, Rosy, Rani)

Middle person (Rosy) age = Sum of ages ÷ Number of persons

Rosy age = 48 ÷ 3 = 16 years

Therefore The correct answer is 16 years.

Alternate Method

Given: Sum of ages = 48 years. Rani > Rosy by 1 year. Rosy > Rimmy by 1 year.

Formula Used: Sum of ages = Age1 + Age2 + Age3

Let Rosy's age be x years.

=> Rimmy's age = (x − 1) years

=> Rani's age = (x + 1) years

=> (x − 1) + x + (x + 1) = 48

=> 3x = 48

=> x = 48 ÷ 3

=> x = 16 years

Therefore The correct answer is 16 years.

Additional Information

Ages in Arithmetic Progression

If the ages of 'n' people differ by a constant value, the middle value is always the average of their ages (Sum ÷ n).

Linear Equation Method

Always assume the variable 'x' for the person whose age is asked to minimize calculation steps at the end.

Q19. Answer: (b) $27x^2 + 16$

Shortcut Trick

Use the algebraic identity: $(a + b)^2 + (a - b)^2 + (a + b)(a - b) = 3a^2 + b^2$.

Here, a = 3x and b = 4.

Result = $3(3x)^2 + 4^2$ => $3(9x^2) + 16$ => $27x^2 + 16$.

Therefore The correct answer is $27x^2 + 16$.

Alternate Method

Given: $(3x + 4)^2 + (3x - 4)^2 + (3x + 4)(3x - 4)$

Formula Used:

1. $(a + b)^2 = a^2 + 2ab + b^2$

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

3. $(a + b)(a - b) = a^2 - b^2$

Calculations:

=> Expansion of $(3x + 4)^2 = (3x)^2 + 2(3x)(4) + 4^2 = 9x^2 + 24x + 16$

=> Expansion of $(3x - 4)^2 = (3x)^2 - 2(3x)(4) + 4^2 = 9x^2 - 24x + 16$

=> Expansion of $(3x + 4)(3x - 4) = (3x)^2 - 4^2 = 9x^2 - 16$

=> Sum = $(9x^2 + 24x + 16) + (9x^2 - 24x + 16) + (9x^2 - 16)$

=> Combining like terms: $(9x^2 + 9x^2 + 9x^2) + (24x - 24x) + (16 + 16 - 16)$

=> $27x^2 + 0 + 16$

=> $27x^2 + 16$

Therefore, the correct option is (2).

Therefore The correct answer is $27x^2 + 16$.

Additional Information

Sum of Squares Identity

The sum of $(a+b)^2$ and $(a-b)^2$ is always equal to $2(a^2 + b^2)$, which simplifies calculations involving symmetric binomials.

Difference of Squares

The product of the sum and difference of two terms is given by $(a + b)(a - b) = a^2 - b^2$.

Difference of Squares Subtraction

Subtracting the square of the difference from the square of the sum results in $(a + b)^2 - (a - b)^2 = 4ab$.

Q20. Answer: (c) coal tar

The correct answer is coal tar.

Key Points

• Naphthalene balls are made from coal tar.

• Moths and other insects are repelled by naphthalene balls.

• The deadly white solid naphthalene, which has a pungent odour, is frequently employed as a moth repellant.

• Coal gas contains flammable gases.

• Petroleum or coal tar can be used to make naphthalene.

• Coal tar distillation and fractionation are the most typical production processes.

• The naphthalene is subsequently purified by fractionation, decolourization, and crystallisation.

Additional Information

• Coke

• Coke is produced by heating coal or oil without the presence of air, which is a damaging distillation process.

• Coke is a grey, hard, and porous fuel with a high carbon content and minimal impurities.

• Coal gas

• A fuel comprised of hydrogen, methane, and carbon monoxide known as coal gas is created through destructive distillation, which is the continuous heating of bituminous coal without the presence of air.

• With various amounts of other elements including hydrogen, sulphur, oxygen, and nitrogen, coal is mostly composed of carbon.

• Coal

• One of the most practical fossil fuels is coal.

• A combination of gases that were once utilised for lighting and heating and obtained by the destructive distillation of coal.

• The majority of its components are hydrocarbons and carbon, both of which contain energy that can be released when burned (burning).

Q21. Answer: (b) West

According to the given conditions:

she is facing west direction.

Hence, the correct answer is "Option 2"

Q22. Answer: (b) 3.09 cm

Shortcut Trick

In similar triangles, the ratio of corresponding sides is always equal.

Ratio of sides AB : DE = 6.5 : 3.9 = 5 : 3.

Therefore, the ratio of sides BC : EF must also be 5 : 3.

EF = (3 ÷ 5) × BC => 0.6 × 5.15 = 3.09 cm.

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Therefore The correct answer is 3.09 cm.

Alternate Method

Given:

AB = 6.5 cm, DE = 3.9 cm, BC = 5.15 cm, and ΔABC ~ ΔDEF.

Formula Used:

For two similar triangles, the ratio of their corresponding sides is equal:

AB ÷ DE = BC ÷ EF = AC ÷ DF

Calculations:

=> AB ÷ DE = BC ÷ EF

=> 6.5 ÷ 3.9 = 5.15 ÷ EF

=> (6.5 × EF) = 3.9 × 5.15

=> 6.5 × EF = 20.085

=> EF = 20.085 ÷ 6.5

=> EF = 3.09 cm

Therefore The correct answer is 3.09 cm.

Additional Information

Similarity Criteria

Two triangles are similar if their corresponding angles are equal (AA) or their corresponding sides are in the same ratio (SSS or SAS).

Ratio of Areas

The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides: Area(ΔABC) ÷ Area(ΔDEF) = (AB ÷ DE)².

Ratio of Perimeters

The ratio of the perimeters of two similar triangles is equal to the ratio of their corresponding sides: Perimeter(ΔABC) ÷ Perimeter(ΔDEF) = AB ÷ DE.

Q23. Answer: (b) CUM57

According to english alphabet positional value

The pattern followed here is :

Hence, the correct answer is "Option 2"

Q24. Answer: (a) 21

Symbol	Meaning
–	×
×	•
•	÷
÷	–

Given expression: 5 – 5 ÷ 6 × 6 + 3

By interchanging symbols and using BODMAS rule we get,

5 × 5 – 6 + 6 ÷ 3

5 × 5 – 6 + 2

25 – 6 + 2

27 - 6

21

Hence, the correct answer is "Option 1"

Q25. Answer: (c) NS*YV

Given table :

numbers/Symbol	6	8	4	•	5	#	%	2	$	1	^	7	9	•	@
Code	S	U	T	W	N	P	V	D	A	Z	J	M	O	M	Y

According to the given conditions:

Rule no.	Condition	Result
(i)	The first and last elements are numbers	the last element will be replaced by the symbol @.
(ii)	the first element is a symbol	the first element will be coded as ©.
(iii)	both the first and second elements are numbers	the third element will be coded as *.

Given code: 5 6 * @ %

Condition (iii) is applied.

So, the code will be : NS*YV.

Hence, the correct answer is "Option 3"

Q26. Answer: (a) Both (a) and (b) are incorrect

The correct answer is Both (a) and (b) are incorrect.

Key Points

• Whether light reflects off a flat surface or a curved surface, it always does so in accordance with the law of reflection. It is possible to pinpoint the location of an object's image by using reflection rules.

• The point from which all reflected light appears to diverge is known as the image location.

• Any incident ray that approaches the mirror while travelling perpendicular to the main axis will, upon reflection, pass through the focal point.

• Any incident ray that makes it to the mirror through the focal point will reflect parallel to the main axis.

Additional Information

• Concave mirror

• By splitting a hollow sphere into parts, painting the external surface, and using the internal surface as the reflecting surface, a mirror can be created. These mirrors are concave mirrors.

• Concave mirror characteristics:

• Light converges at a single point when it strikes and reflects back from the concave mirror's reflecting surface. The term "converging mirror" is occasionally used to describe it because of this.

• The concave mirror can be placed very close to the object to produce a magnified, upright, and virtual image.

• However, as the distance between the object and the mirror grows, the size of the picture diminishes, producing a true and inverted image instead.

• Convex mirror

• If the cut piece is painted from the inside, the hollow spherical object's exterior surface serves as the reflective surface. Convex mirrors are the name for this form of a mirror.

• Convex mirror characteristics:

• Because a convex mirror diverges light beams when they hit its reflecting surface, it is also known as a diverging mirror.

• Convex mirrors always produce imaginary, erect, and truncated pictures regardless of how far an object is from the mirror.

Q27. Answer: (b) 33

From the given information:

Symbol	Meaning
•	÷
–	×
×	•
÷	–

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Now we substitute the values in the given equation and solve it using the BODMAS rule:

Given:

45 + 9 – 4 × 15 ÷ 2 = ?

After interchanging symbols:

45 ÷ 9 × 4 + 15 - 2 = ?

5 × 4 + 15 - 2 = ?

20 + 15 - 2 = ?

35 - 2 = ?

33 = Answer

Hence the correct answer is option 2)

Q28. Answer: (a) 265/9

Shortcut Trick

Total frequency N = 8 + 7 + 9 + 12 + 11 = 47. Half of N = 23.5.

Identify Median Class: Cumulative frequencies are 8, 15, 24 (contains 23.5). Median class = 20−30.

Apply Median = l + [((N/2) − cf) ÷ f] × h = 20 + [(23.5 − 15) ÷ 9] × 10.

Calculation: 20 + (8.5 × 10) ÷ 9 = 20 + 85/9 = (180 + 85) ÷ 9 = 265/9.

Therefore The correct answer is 265/9.

Alternate Method

Given: Frequency distribution with classes 0−10, 10−20, 20−30, 30−40, 40−50 and frequencies 8, 7, 9, 12, 11 respectively.

Formula Used: Median = l + [((N ÷ 2) − cf) ÷ f] × h

Step 1: Calculate Cumulative Frequency (cf):

=> For 0−10: cf = 8

=> For 10−20: cf = 8 + 7 = 15

=> For 20−30: cf = 15 + 9 = 24

=> For 30−40: cf = 24 + 12 = 36

=> For 40−50: cf = 36 + 11 = 47

Step 2: Find the Median Class:

=> Total N = 47

=> N/2 = 47 ÷ 2 = 23.5

=> Cumulative frequency just greater than 23.5 is 24, which belongs to class 20−30.

Step 3: Calculate Median:

=> l = 20 (lower limit), f = 9 (frequency), cf = 15 (previous cf), h = 10 (width)

=> Median = 20 + [((47 ÷ 2) − 15) ÷ 9] × 10

=> Median = 20 + [(23.5 − 15) ÷ 9] × 10

=> Median = 20 + [8.5 ÷ 9] × 10

=> Median = 20 + 85/9

=> Median = (180 + 85) ÷ 9 = 265/9

Therefore The correct answer is 265/9.

Additional Information

Mean for Grouped Data

Calculated as $\sum f_i x_i \div \sum f_i$, where x_i is the class mark (midpoint) of each interval.

Mode for Grouped Data

Mode = l + [(f1 − f0) ÷ (2f1 − f0 − f2)] × h, where f1 is the frequency of the modal class.

Empirical Relationship

For a moderately skewed distribution: 3 × Median = Mode + 2 × Mean.

Q29. Answer: (b) Zakat

The correct answer is Zakat.

Key Points

• Zakat is known as an Islamic finance term referring to the obligation that an individual has to donate a certain proportion of wealth each year to charitable causes.

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• One of the primary methods of Islamic social financing is Zakat, the Muslim obligation to donate 2.5% of one's annual wealth to charity.

• It is frequently utilised in Muslim nations to finance domestic development and poverty-reduction initiatives and the express goal is to alleviate inequality.

• The calculation of zakat depends on both income and asset value.

Additional Information

• Mudarabah

• Profit and Loss: The term "sharing" (also known as "PLS" or "participatory banking") describes equity financing methods that adhere to Sharia law, such as musharakah and mudarabah. The majority of Muslims adhere to a religious restriction against borrowing interest, which is respected by these systems.

• While Musharakah refers to an equity participation arrangement, Mudarabah is a "trustee finance" or passive partnership deal.

• Ijarah

• Ijarah, a phrase used in Islamic banking and finance, denotes "providing services and goods temporarily for a wage" or "giving something on rent." (a noun, not a verb).

• According to classical fiqh, it refers to a contract that normally has a set duration and price and is used to hire people, rent or lease services, or provide "usufruct" over the property.

• Musharakah

• A joint venture or partnership known as a "musharakah" in Islamic finance enables partners to divide an enterprise's profits and losses.

• Since benefiting from interest on loans is prohibited by Islamic law (Sharia), musharakah permits the financier of a project or business to receive a return in the form of a percentage of the real profits in accordance with a predetermined ratio.

Q30. Answer: (c) Sodium hydroxide

The correct answer is Sodium hydroxide.

Key Points

• A base is sodium hydroxide.

• Red litmus is changed to blue by the base. Sodium hydroxide converts red litmus into blue in this way.

• Blue paper won't alter when exposed to a sodium hydroxide solution that is dilute.

• Since sodium hydroxide (pH-12) is an alkali, it will cause the pH paper to turn blue.

Additional Information

Acid and Base

Acid	Base
• Acids have a sour flavour.	• Bases feel soapy and have a bitter flavour.
• Sour fruits, vinegar, toilet cleanser, sodium hydroxide, and other substances all include acids.	• Bases are found in things like neem, clove, and soaps.
• Acids cause the blue litmus paper to turn red.	• When bases are present, the litmus paper becomes blue.

Q31. Answer: (c) Box 36

Five boxes numbered 36, 74, 27, 51 and 92 are kept one above the other.

1) Box 51 is on the topmost position

2) Only one box is above box 27

Boxes
51
27

3) Only box 92 is between box 74 and box 36

4) Box 36 is not at the bottom most position

Boxes
51
27
36
92
74

Box 36 is kept in the exact middle position.

Hence, the correct answer is "Option 3"

Q32. Answer: (c) -19

Shortcut Trick

For any quadratic equation ax2 + bx + c = 0, the sum of roots is given by −b/a.

Comparing x2 + 19x + 60 = 0, we have a = 1 and b = 19.

Sum of roots = −19 / 1 = −19.

Therefore The correct answer is -19.

Alternate Method

Given:

Quadratic equation: x2 + 19x + 60 = 0

Formula Used:

Standard form of a quadratic equation: ax2 + bx + c = 0

Relationship between roots and coefficients:

Sum of roots (α + β) = −b / a = − (coefficient of x) / (coefficient of x2)

Calculations:

=> Comparing x2 + 19x + 60 = 0 with ax2 + bx + c = 0:

=> a = 1 (coefficient of x2)

=> b = 19 (coefficient of x)

=> c = 60 (constant term)

=> Sum of roots = −b / a

=> Sum = −19 / 1

=> Sum = −19

Therefore The correct answer is -19.

Additional Information

Product of Roots

The product of roots (αβ) of a quadratic equation ax2 + bx + c = 0 is equal to c/a. For the given equation, the product is 60/1 = 60.

Nature of Roots

The nature is determined by the Discriminant (D) = b2 − 4ac. Here, D = 192 − 4(1)(60) = 361 − 240 = 121. Since D > 0 and is a perfect square, the roots are real, distinct, and rational.

Quadratic Formula

The roots can be found using x = [−b ± √(b2 − 4ac)] / 2a. For this equation, the roots are x = (−19 ± 11) / 2, which gives x = −4 and x = −15.

Q33. Answer: (b) Four

Given series : 2 7 3 5 7 1 5 7 3 5 7 1 9 7 3 5 7 1 7 3 6 5 7 1 8 1 4 7 3 5

The pattern followed here is,

5 → 7 → 1

2 7 3 5 7 1 5 7 3 5 7 1 9 7 3 5 7 1 7 3 6 5 7 1 8 1 4 7 3 5

There are Total Four 7s in the following sequence which is immediately followed by 1 and immediately preceded by 5.

Hence, the correct answer is "Option 2"

Q34. Answer: (b) 1/4

Formula used:

$a^3 - b^3 = (a - b)(a^2 + b^2 + a\,b)$

Where, a and b are 1st and 2nd term respectively

Calculation:

Here, we have $[(0.68)^2 + (0.32)^2 + 16 \times 0.0136]$over$[(0.68)^3 - (0.32)^3] \div (0.3)^2$

Now, multiply by (0.68 - 0.32) in both numerator and denominator respectively

$\Rightarrow (0.68 - 0.32)[(0.68)^2 + (0.32)^2 + 0.2176]$ over$(0.68-0.32)[(0.68)^3 - (0.32)^3] \div (0.3)^2$

Now, the numerator of this equation is in the form of

$(a - b)(a^2 + b^2 + ab) = (a^3 - b^3)$

Where a = 0.68 and b = 0.32

$\Rightarrow [(0.68)^3 - (0.32)^3]$ over $(0.68 - 0.32)[(0.68)^3 - 0.32)^3] \div (0.3)^2 = 1$over$0.36 \div 0.09 = 1/4$

Hence, the required value of the equation is 1/4.

Q35. Answer: (a) Scrutinises and approves budgets of the Block Samities

The correct answer is Scrutinises and approves budgets of the Block Samities.

Key Points

• The administrative functions of Gram Panchayats are:

• Maintenance, repair, and building of wells drains, bridges, and other public works and welfare projects.

• Install and maintain good street lamps.

• Give forth primary education to the children.

• The economic and social functions (not obligatory) of Gram Panchayats are:

• Build libraries, wedding venues, etc.

• Create and manage cooperative credit societies and fair-priced businesses.

• Create orchards, ponds, and gardens.

• Judicial activities (Nyaya Panchayat; the state judicial service decides jurisdiction) of Gram Panchayats are:

• Ensure prompt and affordable justice.

• Can levy fines of up to 100 rupees.

• Not using legal counsel.

Important Points

• The Gram Panchayat may request modifications to the budget, which the Zilla Parishad may approve or reject within the time frame specified.

Additional Information

• In Indian villages, the basic local governing body is called the Gram Panchayat.

• In India, the grassroots level has a democratic structure. It is a political organisation that serves as the cabinet of the village.

• The Gram Sabha serves as the Gram Panchayat's main body. The Gram Sabha elects the individuals that make up the Gram Panchayat.

• India has well over 250,000 Gram Panchayats.

Q36. Answer: (a) doubled

The correct answer is doubled.

Key Points

• Resistance is inversely correlated with wire cross-sectional area and directly correlated with wire length.

• The resistance doubles if the length of a wire is increased by adding more wire, while the cross-sectional area remains unchanged.

• Resistance (R)= ρL/A

• We know that

• R= ρL/A ----(i)

• If the wire's length doubles, a new resistance will result.

• R'= ρ2L/A ------(ii)

• By adjusting equation (ii), we obtain

• R'= 2R

• Therefore, it follows that the new resistance will similarly double as the wire's length increases.

Additional Information

• Resistance

• The ability of an electric conductor to resist the flow of current through it is known as the conductor's resistance.

• R serves as a symbol for it.

• Ohm (Ω) is the SI unit for resistance.

• Resistance (R)= ρL/A

• Where l is the conductor's length, A is its cross-sectional area, and ρ is the conductor's resistivity?

Q37. Answer: (b) (161, 192)

Shortcut Trick

Co-prime numbers have a Highest Common Factor (HCF) of 1.

Check divisibility: (156, 234) are even → HCF ≥ 2.

(196, 343) are multiples of 7 → HCF ≥ 7.

(228, 247) are multiples of 19 → HCF = 19.

(161, 192): 161 = 7 × 23, while 192 is not divisible by 7 or 23.

Therefore The correct answer is (161, 192).

Alternate Method

Given Pairs: (156, 234), (161, 192), (196, 343), (228, 247)

Step-by-step Verification:

=> For (156, 234): Both are even numbers. HCF(156, 234) = 78 ≠ 1.

=> For (196, 343): 196 = 7 × 28 and 343 = 7 × 49. HCF(196, 343) = 49 ≠ 1.

=> For (228, 247): 228 = 12 × 19 and 247 = 13 × 19. HCF(228, 247) = 19 ≠ 1.

=> For (161, 192): Factors of 161 are 1, 7, 23, 161. Factors of 192 are 1, 2, 3, 4, 6, 8... 192. Only common factor is 1.

Therefore The correct answer is (161, 192).

Additional Information

Definition of Co-prime

Two numbers are co-prime (or relatively prime) if they share no common positive factors other than 1.

Consecutive Integers

Any two consecutive integers (e.g., 15, 16) are always co-prime to each other.

Prime Numbers Rule

Two different prime numbers are always co-prime. However, a pair of co-prime numbers does not necessarily need to be prime (e.g., 8 and 9).

Q38. Answer: (d) Combination of nervous and muscular tissues

The correct answer is combination of nervous and muscular tissues.

Key Points

• Animals can move quickly in reaction to stimuli thanks to both their muscular and neurological systems.

• Neurons take in a stimulus and send it on to the brain and spinal cord for processing.

• Motor neurons then transmit the response impulse back to the effector organ, which is typically a muscle in most situations.

• Muscles respond to an impulse by moving in the desired direction.

Additional Information

• Connective tissue

• Supporting tissue protects and supports the body's other tissues and organs.

• In addition to helping to transport nutrients and other substances between tissues and organs, connective tissue also helps to store fat and mend damaged tissue.

• A gel-like substance, fibres, and cells make up connective tissue.

• Epithelial tissue

• The epithelium is a type of body tissue that covers all of the internal and exterior body surfaces, lines hollow organs and body cavities, and makes up the majority of glandular tissue.

• Muscular tissue

• Specialized cells called muscle fibres make up the muscular system. Its primary characteristic is its capacity to contract.

• Muscles that are attached to bones, internal organs, or blood arteries are what move things.

• Skeletal, smooth, and cardiac muscle tissue are the three different types of muscle tissue.

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Q39. Answer: (b) Kerala

The correct answer is Kerala.

Key Points

• The Western Ghats of Kerala, a coastal state in India, are where the Arabian Sea Branch of the Southwest Monsoon enters the country, making this area the first to see rainfall from the monsoon.

• Kerala, an Indian coastal state, is the first state in India to experience rainfall from the Southwest Monsoon because the Arabian Sea Branch of the monsoon strikes the Western Ghats first.

Additional Information

• In general, it is anticipated that the southwest monsoon would start around the beginning of June and terminate by the end of September.

• The Arabian Sea Branch and the Bay of Bengal Branch are formed when the moisture-laden winds split upon reaching the southernmost tip of the Indian Peninsula, which is a result of its topography.

Q40. Answer: (d) Article 343

The correct answer is Article 343.

Key Points

• Article 343 of the Indian Constitution stipulates that Hindi written in Devanagari script should be the Union's official language.

• The Devanagari script of Hindi is designated as the official language of the Union under Article 343 (1) of the Constitution.

• The use of English in official Union business may continue for a further 15 years (i.e., until January 25, 1965) following the Constitution's start date, according to Article 343 (2).

• English will still be used for official purposes even after January 25, 1965, according to Article 343(3) of the Constitution.

• For a number of predetermined purposes, such as Resolutions, General Orders, Rules, Notifications, Administrative and Other Reports, Press Communiqués, Administrative and Other Reports and Official Papers to be Presented Before a House or the Houses of Parliament, Contracts, Agreements, Licensing and Permits, Tender Notices and Forms of Tender, etc., both Hindi and English must be used in accordance with Section 3(3) of the Act.

Additional Information

• Article 345

• The legislature of a state may select "any one or more of the languages in use in the State or Hindi as the language or languages to be used for all or any of the official purposes" of the concerned State, as per Article 345 of the Constitution.

• Article 342

• The provisions relating to Scheduled Tribes are covered by Article 342. It states that the President may specify the tribes or tribal communities, or portions of or groups within tribes or tribal communities, which shall, for the purposes of this constitution, deemed to be scheduled tribes in relation to that State or Union Territory, as the case may be, after consulting with the Governor thereof by public notification.

• Article 343

• The official language of the Union will be Hindi in Devanagari script. Indian numerals in their international format must be utilised for all official purposes by the Union.

Q41. Answer: (c) investment

The correct answer is investment.

Key Points

• A multiplier is a numerical coefficient that illustrates how changes in total national investment affect total national income in economics,

• It is equivalent to the proportion of changes in investments to the changes in overall revenue.

Additional Information

• The multiplier's magnitude is determined by the proportion of deposits that banks must retain in their reserves.

• The money supply reserve multiplier rises when the reserve requirement is decreased and falls the opposite way.

• The fiscal multiplier measures the relationship between an increase in a nation's national income and the original increase in expenditure or decrease in taxes that generated that income.

Q42. Answer: (b) Only iii and i

The correct answer is Only iii and i.

Key Points

• A type of reaction called a double displacement reaction involves the exchange of ions between two reactants to create two new molecules.

• As an unintended consequence of double displacement processes, precipitates frequently occur.

• A colour shift could or might not be the outcome of a twofold replacement reaction.

• The interaction between potassium iodide with lead nitrate solution. This reaction causes the colour to shift from colourless to yellow.

Additional Information

• Double displacement reaction

• When two chemicals interact by transferring ions, a double displacement reaction occurs, creating two new molecules.

• In the twofold displacement process, positive ions trade places with negative ions.

• In water-soluble ionic compounds, numerous double displacement reactions take arise.

• A double displacement process involves the movement of atoms from two different substances.

• Example: Na 2 S+2HCl→2NaCl+H 2 S

Q43. Answer: (d) Only conclusion (II) follows.

The least possible venn diagram of the given statement is:

Conclusions:

(I) Some Books are Designs. → False (as there is no definite relation between Books and designs as shown in Venn diagram)

(II) All Pages are Catalogues. → True (according to the statement All Pages are Books and All Books are Catalogues so, all pages are catalogues)

Only conclusion (II) follows.

Hence, the correct answer is "Option 4"

Q44. Answer: (c) Cell B or D

The correct answer is Cell B or D.

Key Points

• Recyclable

• The process of recycling waste into new materials and objects is called recycling.

• This idea frequently includes the process of extracting energy from waste.

• The capacity of a material to reacquire its original properties determines its recyclability.

• It is an alternative to "conventional" waste disposal that can help reduce emissions of greenhouse gases while also saving material.

• The third step in the "Reduce, Reuse, and Recycle" waste hierarchy is recycling, which is one of the most important aspects of modern waste reduction.

• Non- Recyclable

• Materials that cannot be recycled in your dry-mixed recycling are referred to as non-recyclable waste. Polystyrene, pet waste, bubble wrap, windows, mirrors, and plastic film are examples of these.

• In EfW (energy from waste), waste that cannot be recycled or is not biodegradable can be used as fuel.

• These facilities burn waste, generating steam that powers a steam turbine to generate electricity.

• In turn, that turbine generates heat for homes and businesses in the area.

Additional Information

• Combustibility and flammability

• Anything that can burn, or combust, in the air is a combustible substance.

• If a material easily ignites at ambient temperatures, it is flammable.

• To put it another way, a combustible substance can be ignited with some effort, whereas a flammable substance ignites immediately upon being exposed to flame.

• Air's degree of flammability or combustibility is largely determined by the material's volatility, which is related to the temperature-dependent composition-specific vapour pressure.

Q45. Answer: (b) 8

Formula used:

100% = Total numbers of cars sold

Calculation:

Here, total numbers of cars sold = 80

As 100% = 80

=> 1% = 0.8

Now, cars sold in Delhi = 25%

=> 25 × 0.8 = 20

Now, according to the given question

Numbers of cars sold to female : male = 2 : 3

Numbers of cars sold to female customers = 2/5 × 20 = 8

Hence, the numbers of cars sold to female customers in Delhi is 8.

Q46. Answer: (c) Only conclusion I is true

Given statement :

L > M ≥ 2 > N > O = P ≤ Q < R

I.O < R → True (as O = P ≤ Q < R gives; as R > Q ≥ P = O so, O < R is true)

II. M > Q → False(as M ≥ 2 > N > O = P ≤ Q < R as no clear relation between M and Q)

Only conclusion I is true

Hence, the correct answer is "Option 3"

Q47. Answer: (d) October

The correct answer is October.

Key Points

• On October 2, 1869, in Porbandar, Gujarat, Mahatma Gandhiji was born.

• In India, a national holiday called Gandhi Jayanti is observed to commemorate Mahatma Gandhi's birth.

• One of India's three national holidays, it is observed on the second of October each year.

• Since he was a nonviolent freedom fighter, the UN General Assembly announced on June 15, 2007, that it had passed a resolution designating October 2 as the International Day of Non-Violence.

Additional Information

• On October 2, people around the world honour Gandhi.

• It is a federal holiday that is celebrated across the nation's states and territories.

• All around India, especially at Gandhi's tomb, Raj Ghat, in New Delhi, where he was cremated, prayer services and tributes are held to commemorate Gandhi Jayanti.

• Prayer gatherings and commemoration celebrations held by colleges, local government agencies, and socio-political organizations in many cities are popular activities.

Q48. Answer: (a) 160

Formula used:

Average = Sum of values / No. of values

Calculation:

Number of boys in school P = 200

Number of boys in school Q = 90

Number of boys in school R = 190

Number of boys in all the three schools = 200+ 90 + 190 = 480

Number of schools = 3

Average = Sum of values/No. of values

=> 480/3 = 160

Hence, average number of boys in three schools is 160.

Q49. Answer: (d) 12 km towards the west

According to given condition :

He drives 12 Km (13 - 5 = 8 + 4 Km) in order to reach Point A from Point B

And he is towards the west direction in order to reach Point A from Point B

Hence, the correct answer is "Option 4"

Q50. Answer: (b) 385

Shortcut Trick

First number = (55 × 18) + 11 = 990 + 11 = 1001

Using the Product Rule: Number1 × Number2 = HCF × LCM

Number2 = (77 × 5005) ÷ 1001

Since 5005 ÷ 1001 = 5, then Number2 = 77 × 5 = 385

Therefore The correct answer is 385.

Alternate Method

Given:

LCM = 5005 | HCF = 77

For the first number (N1): Divisor = 55, Quotient = 18, Remainder = 11

Formula Used:

1. Dividend = (Divisor × Quotient) + Remainder

2. N1 × N2 = HCF × LCM

Calculations:

=> N1 = (55 × 18) + 11

=> N1 = 990 + 11 = 1001

=> N1 × N2 = 77 × 5005

=> 1001 × N2 = 77 × 5005

=> N2 = (77 × 5005) ÷ 1001

=> N2 = 77 × 5

=> N2 = 385

Therefore The correct answer is 385.

Additional Information

Fundamental Property of HCF and LCM

The product of any two positive integers is equal to the product of their HCF and LCM. Formula: a × b = HCF(a, b) × LCM(a, b).

Division Algorithm

For any two integers, the Dividend is found using: Dividend = (Divisor × Quotient) + Remainder, where 0 ≤ Remainder < Divisor.

HCF as a Factor of LCM

For any set of numbers, the HCF is always a factor of the LCM. If the HCF does not divide the LCM perfectly, such numbers cannot exist.

Q51. Answer: (c) 198 m

Shortcut Trick

Distance covered in 1 revolution = Circumference = π × d

Distance in 1 revolution = (22/7) × 63 = 22 × 9 = 198 cm

Distance covered in 100 revolutions = 100 × 198 = 19800 cm

Convert to meters (1 m = 100 cm): 19800 ÷ 100 = 198 m

Therefore The correct answer is 198 m.

Alternate Method

Given:

Diameter of the wheel (d) = 63 cm

Number of revolutions (n) = 100

Formula Used:

Circumference of a wheel = π × d

Total distance covered = n × Circumference

d = 63

1 Rev = π × d = 198 cm

Distance (100 Rev) = 100 × 198 cm

= 19800 cm = 198 m

Calculation:

=> Circumference = (22/7) × 63 cm

=> Circumference = 22 × 9 = 198 cm

=> Total distance covered in 100 revolutions = 100 × 198 cm

=> Total distance = 19800 cm

=> Since 1 meter = 100 cm, Total distance in meters = 19800 ÷ 100 m

=> Total distance = 198 m

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Therefore The correct answer is 198 m.

Additional Information

Wheel Revolutions Concept

When a circular wheel makes exactly one full rotation along the ground, the linear distance it travels perfectly equals its perimeter, which is the circumference (C = 2πr or C = πd).

Number of Revolutions Formula

Number of revolutions (n) = Total distance covered ÷ Circumference of the wheel. Always ensure the total distance and circumference are measured using the same units.

Basic Unit Conversions

1 meter (m) = 100 centimeters (cm)

1 kilometer (km) = 1000 meters (m)

1 kilometer (km) = 100,000 centimeters (cm)

Q52. Answer: (d) Maximum

The correct answer is Maximum.

Key Points

• The generated current in the wire is known as induced current since it is caused by a shifting magnetic field. The magnetic flux's rate of change would be directly proportional to the induced current.

• When the coil is moving at a straight angle to the magnetic field, the induced current is at its maximum.

• As the flux cutting is greatest in this situation, the induced current is highest when the coil is moving in a direction that is 90° or perpendicular to the magnetic field.

• The coil will cut the least amount of flux when it is moving in a direction that is parallel to or at an angle of 180 degrees to the magnetic field.

Additional Information

• Induced current

• An emf is induced in a wire coil whenever the magnetic field surrounding the coil changes. If the conductor circuit is closed, current will also flow through the circuit together with this induced emf. The induced current is the name of this current.

• The following techniques can be used to alter the magnetic field:

• By angling a magnet in relation to the coil.

• By shifting the coil's position in relation to the magnetic field.

• By adjusting the coil's surface area in the magnetic field

• Through the coil's rotation in relation to the magnet.

Q53. Answer: (d) 55.296

The pattern followed here is ;

Hence, the correct answer is "Option 4"

Q54. Answer: (a) 2.26 × 108 m/s

The correct answer is 2.26 × 108 m/s

Key Points

• Calculation

• Given,

Refractive index = 1.33

We know,

n= c/v

1.33= 299792458/ v

v= 299792458/1.33

v= 2.25 × 10^8 m/s

Additional Information

• Refractive index

• In optics, an optical medium's refractive index (or refraction index) is a dimensionless number that indicates its ability to bend light.

• The degree to which light travels through a material is determined by its refractive index.

• Snell's law of refraction, n1 sinθ1 = n2 sinθ2, where n1 and n2 are the angles of incidence and refraction of a ray crossing the

interface of two media with refractive indices n1 and n2, respectively, describes this.

• In addition, the critical angle for total internal reflection, their intensity (Fresnel's equations), and Brewster's angle are all determined by the refractive indices when light reaches the interface.

• The ratio of the speed of light in a vacuum, c = 299792458 m/s, to the phase velocity v of light in the optical medium is known as the absolute refractive index n.

n= c/v

Q55. Answer: (b) 17 1/3

Shortcut Trick

A whole work = 10 × 3 = 30 days; B whole work = 30 × 4 = 120 days; A+B+C = 12 days.

Total Work (LCM of 30, 120, 12) = 120 units.

Efficiencies: A = 4, B = 1, A+B+C = 10 => C = 10 − (4+1) = 5.

Day 1 (A+B) = 4+1 = 5; Day 2 (A+C) = 4+5 = 9. 2-day cycle = 14 units.

8 cycles (16 days) = 14 × 8 = 112 units. Remaining = 8 units. Day 17 (A+B) = 5 units. Left = 3 units.

Time on Day 18 = 3 ÷ 9 = 1/3 day. Total = 17 1/3 days.

Therefore The correct answer is 17 1/3 days.

Alternate Method

Given: A completes 1/3 work in 10 days; B completes 1/4 work in 30 days; A+B+C together in 12 days.

Formula: Total Work = Time × Efficiency.

Person	Days	Total Work	Efficiency
A	30	120	4
B	120	1	
A+B+C	12	10	

=> Efficiency of C = (A+B+C) − A − B = 10 − 4 − 1 = 5

=> Work on Day 1 (A + B) = 4 + 1 = 5 units

=> Work on Day 2 (A + C) = 4 + 5 = 9 units

=> Work in 2 days = 5 + 9 = 14 units

=> Work in 16 days (8 cycles) = 14 × 8 = 112 units

=> Remaining work = 120 − 112 = 8 units

=> Day 17 work (A + B) = 5 units; Remaining = 8 − 5 = 3 units

=> Time for remaining work by (A + C) = 3/9 = 1/3 day

=> Total time = 16 + 1 + 1/3 = 17 1/3 days

Therefore The correct answer is 17 1/3 days.

Additional Information

Alternate Day Work

In alternate day problems, calculate the work done in one complete cycle (usually 2 or 3 days) and then divide the total work by the cycle total to find the number of full cycles.

Efficiency and Time

Efficiency is inversely proportional to time. If A takes T days to do work W, efficiency η = W ÷ T.

Combined Work Formula

If individuals A, B, and C can do work in a, b, and c days respectively, then (1/a + 1/b + 1/c) × Time = 1.

Q56. Answer: (d) K > Q

Given statement : K ≥ U = N > Q < R = T ≤ P

I. T < R → False (as R = T but not T < R)

II. Q > U → False (as N > Q and U = N then U = N > Q not possible)

III. K = N → False (as K ≥ U = N not K = N)

IV. K > Q → True (as K ≥ U = N > Q so, K > Q)

Hence, the correct answer is "Option 4"

Q57. Answer: (d) Promotion of feudalism

The correct answer is Promotion of feudalism.

Key Points The following is a list of some of the key elements of the Indian Constitution:

• Federalism: Separation of federal and state powers

• Government by the People under a Parliamentary System

• Fundamental Rights: The division of powers between the legislative, executive, and judicial branches

• Secularism: Separation of State and Religion

Additional Information

• Feudalism in India was defined by a class of landowners and a class of subject peasants who both lived in an economy that was mostly agrarian, characterised by a drop in trade and urbanisation as well as a sharp decline in the use of metal money.

• Promotion of feudalism is not a key feature or the basic feature of the Indian Constitution.

Q58. Answer: (a) Girls should consume chips and packed or tinned snacks to meet nutritional needs.

The correct answer is Girls should consume chips and packed or tinned snacks to meet nutritional needs.

Key Points

• Good menstrual hygiene and health habits will help you avoid infections, lessen odours, and keep you at ease while you're on your period.

• Prior to using a menstruation product, wash your hands both before and after using the restroom.

• Used menstruation products should be properly disposed of.

• Regardless of how little the flow is, change sanitary pads every few hours. If your period is heavy, change them more regularly.

• A single tampon should not be worn for longer than 8 hours at a time.

• Every day after use, clean the cups. After your period has ended, sanitise menstruation cups by giving them a good rinse and then putting them in a pot of boiling water for one to two minutes.

• The majority of washable period underwear is made to be reused.

Additional Information

• While on your period, you may maintain your health and comfort by following these hygiene precautions:

• Put on breathable, lightweight clothing (such as cotton underwear). Tight clothing can keep heat and moisture in, which helps bacteria grow.

Regularly replace your menstruation products.

• Maintain a clean genital area. Every day, wash the outside of your vagina and bottom.

• Use pads, tampons, or toilet paper without scents. The skin can become inflamed, and your natural pH balance can be affected by scented hygiene products.

• Obtain plenty of liquids. By washing out your urinary system, you can avoid diseases like vaginal candidiasis.

• Keep tabs on your period. Your menstrual cycle serves as an important barometer of your general health. Period irregularities may indicate health issues like diabetes, thyroid issues, or celiac disease.

Q59. Answer: (b) Phloem

The correct answer is Phloem.

Key Points

• The vascular tissue in plants that carries food is called phloem.

• The many storage organs receive the food molecules that the leaves have created. such as fruits, stems, and roots.

• The phloem carries nutrients from the leaves to the roots.

• A plant component called phloem consists of companion cells, sieve tubes, phloem fibres, and phloem parenchyma cells.

Additional Information

• Sclerenchyma

• It is a kind of supporting tissue that often consists of dead cells with walls that have been heavily thickened with lignin.

• The mature sections of the plant are where it is primarily found.

• Xylem

• The Greek word "xylon," which means wood, is where the term "xylem" comes from.

• The term xylem was created by Carl Nägeli. The vascular tissue known as the xylem is found in plants and is largely responsible for moving water and nutrients from the roots to the stem and leaves.

• They also give the plants mechanical strength.

• Collenchyma

• Two cellular structures called parenchyma and collenchyma make up the majority of plant tissues.

• Collenchyma cells are live cells, just like parenchyma cells. They are made of cellulose and water, which aids in the maintenance of the plant's morphology.

Q60. Answer: (a) 50

Shortcut Trick

Age difference remains constant. Ratio 5 years ago (Ramesh:Rajiv) = 3:1 (diff 2 units).

Ratio 10 years later (Ramesh:Rajiv) = 2:1 (diff 1 unit). To equate difference, multiply by 2 → 4:2.

Change in units = 4 − 3 = 1 unit. Real time gap = 10 − (−5) = 15 years.

1 unit = 15 years. Ramesh's age 5 years ago = 3 units = 3 × 15 = 45 years.

Present age of Ramesh = 45 + 5 = 50 years.

Therefore The correct answer is 50 years.

Alternate Method

Let present ages of Ramesh and Rajiv be R and r respectively.

Condition 1 (10 years later): R + 10 = 2(r + 10) => R − 2r = 10 --- (i)

Condition 2 (5 years ago): R − 5 = 3(r − 5) => R − 3r = −10 --- (ii)

Subtract (ii) from (i): (R − 2r) − (R − 3r) = 10 − (−10)

=> r = 20 years (Rajiv's present age)

Substitute r in (i): R − 2(20) = 10 => R − 40 = 10

=> R = 50 years

Therefore The correct answer is 50 years.

Additional Information

Constant Age Difference

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

Ratio Balancing Method

If ratios at two different times are given, multiply the terms of each ratio by the difference of the other ratio to make the age gap units consistent.

Linear Equations in Ages

Age problems are easily solved by setting 'x' for the present age and forming equations for 'n' years ago (x − n) or 'n' years hence (x + n).

Q61. Answer: (a) Fleming's right hand rule

The correct answer is Fleming's right-hand rule.

Key Points

• Using Fleming's right-hand rule, we may determine the direction of current produced in a wire travelling in a magnetic field.

• The rule states that if we extend our right hand's forefinger, middle finger, and thumb perpendicular to one another as shown in the figure, with the thumb pointing toward the conductor's motion and the forefinger pointing toward the direction of the magnetic field, the middle finger will give us the direction of the flow of induced current in the circuit

Additional Information

• Maxwell's right-hand screw rule

• According to Maxwell's screw rule, the magnetic field's direction can be determined by rotating a right-handed screw so that it advances in the same direction as the regular current. The Maxwell corkscrew rule is another name for the right-hand thumb rule.

• Maxwell's left-hand screw rule

• It is used to establish the direction of the magnetic field encircling a conductor that is capable of carrying straight current. If the direction of the magnetic field lines connected to the current-carrying conductor is known, it can be utilised to calculate the direction of the electric current in that conductor.

• Fleming's left-hand rule

• To identify the direction of force acting on a current-carrying wire positioned in a magnetic field, utilise Fleming's left-hand rule. The thumb indicates the direction of force acting on the wire if the thumb, index finger (along the magnetic field), and middle finger (along the current) are kept mutually perpendicular.

Q62. Answer: (b) Assam

The correct answer is Assam.

Key Points

• In February 2022, Assam became the 1st state in the country to launch night navigation mobile app in rivers.

• For crossings on the Brahmaputra river in Assam, the first night navigation smartphone application in rivers in the country was launched.

• The transport department and K Raju, the head scientist at IIT Madras, collaborated to build the night navigation mobile application, which will measure the rivers' draught.

• By using these services, district transport offices' (DTOs') annual foot traffic is predicted to drop by roughly four lakhs.

Additional Information

• The State Transport Department's ten contactless Aadhar-based services were also introduced by the Chief Minister to speed up and reduce the cost of delivering public services.

• The CM also introduced an electronic ticketing system for ferry services between Dhubri and Silchar.

• A memorandum of understanding (MoU) was also signed between the State Transport Department and the Common Service Centres (CSCs) under the Ministry of Electronics and Information Technology (MeitY) to provide online services at the panchayat level.

Q63. Answer: (b) 1000

Shortcut Trick

Number of coins = (Volume of original cylinder) ÷ (Volume of each coin)

Ratio of Radius (R/r) = 5 / 0.5 = 10

Ratio of Height (H/h) = 2 / 0.2 = 10

Number = $(R/r)^2 \times (H/h) = 10^2 \times 10 = 1000$

Therefore The correct answer is 1000.

Alternate Method

Given:

Original Cylinder: Diameter = 10 cm, Height = 2 cm

Cylindrical Coin: Diameter = 1 cm, Thickness (Height) = 0.2 cm

Formula Used:

Volume of Cylinder = $\pi r^2 h$

Calculations:

=> Radius of large cylinder (R) = 10 / 2 = 5 cm

=> Radius of coin (r) = 1 / 2 = 0.5 cm

=> Volume of large cylinder = $\pi \times (5)^2 \times 2 = 50\pi$ cm³

=> Volume of one coin = $\pi \times (0.5)^2 \times 0.2 = \pi \times 0.25 \times 0.2 = 0.05\pi$ cm³

=> Number of coins = $(50\pi) / (0.05\pi)$

=> Number of coins = 50 / 0.05 = 5000 / 5 = 1000

Therefore The correct answer is 1000.

Additional Information

Conservation of Volume

When one solid object is melted and recast into other shapes, the total volume remains constant.

Cylinder Properties

Curved Surface Area (CSA) = $2\pi rh$ and Total Surface Area (TSA) = $2\pi r(h + r)$.

Recasting Shortcut

If dimensions are scaled by factor k, volume scales by k^3 for similar shapes.

Q64. Answer: (c) Nai Roshni

The correct answer is Nai Roshni.

Key Points

• A Central Sector Program called Nai Roshni-a Leadership Development Program for Minority Women is available to women from minority communities who are between the ages of 18 and 65 and it began in 2012–2013.

• By giving knowledge, resources, and tactics to sync with government processes, banks, and other organisations at all levels, the programme aims to empower and instil confidence in minority women.

Additional Information Significance of Nai Roshni scheme are as follows:

• In addition to being important for achieving equity, women's empowerment is also a key component of our efforts to eliminate poverty, spur economic growth, and promote civil society.

• In a family living in poverty, women and children always suffer the most and require support and is even more crucial to

empower women, especially mothers, because it is in the house they raise their children and shape their character.

• In addition to claiming their fair share of government development benefits for bettering their lives and living conditions, it empowers minority women to leave the safety and secure environment of their homes and communities and taking their leadership roles and assert their rights to access services, facilities, skills, and opportunities.

Q65. Answer: (c) 16 + 4/11

Formula used:

Angle between the hands = 11 × m/2 - 30H

Where m denotes the minute hand

H denotes the hour hand

Calculation:

The hands of clock can't be together between 2:30 and 3:00

So, we have to look for time between 3:00 and 3:30

The formula for finding the angle between the hour hand and the minute hand is

Angle between the hands = 11 × m/2 -30H

Here, angle = 0, H = 3

=> 0 = 11 × m/2 - 30 × 3

=> m = 180/11 = (16 + 4/11)

Hence, at (16 + 4/11) minutes past 3 the hands of a clock are together.

Q66. Answer: (c) C and Ge

The correct answer is C and Ge.

Key Points

• Each of the following elements has four valence electrons: germanium, silicon, and carbon.

• The production of semiconductor devices uses the rare element germanium. Germanium shares a lot of similarities with silicon in terms of its physical and chemical characteristics.

• Coal, ore, and germanite all contain semi-metal germanium. Germanium is a gray-white metal that crystallizes.

• Group 14 is where both carbon and silicon belong. As a result, both elements have a valence electron with a value of four.

• The nearest substitute for carbon is silicon. Tetravalent elements like carbon and silicon both create mostly covalent non-ionic molecules.

• Therefore, elements that show similar valency as that of silicon are C and Ge.

Additional Information

• Chemically speaking, silicon is an element with the symbol Si and atomic number 14.

• It is a tetravalent metalloid and semiconductor that has a blue-gray metallic sheen and is a tough, brittle crystalline solid.

• With carbon above it and germanium, tin, lead, and flerovium below it on the periodic table, it belongs to group 14.

• The element is a crucial component of bricks and ceramics. Since it is a semiconductor, the element is used to create transistors.

Q67. Answer: (a) 1/1.3

The correct answer is 1/1.3.

Given:

Refractive Index (n) is 1.3

To find:

The value of (sin y)/sinx

Calculation:

Laws of refraction states that "The ratio of sine of the incident angle and the refracted angle is a constant". This constant value is called as refractive index.

Here:

Angle of incidence is x and angle of refraction is y.

So we have:

n=(sin x)/siny

1.3=(sin x)/siny

1/1.3=(sin y)/sinx

Therefore the value is 1/1.3.

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Q68. Answer: (c) 200 Watt

The answer is 200 Watt.

Given:

Resistors of 0.2 Ω, 0.4 Ω, 0.6 Ω, 0.8 Ω are connected in series across a voltage of 20 V.

To find:

Net power (P)

Formula:

$Rs=R1+R2+R3+R4$

$P=(V^2)/R$

Calculations:

Here since the resistors are in series we have:

$Rs=R1+R2+R3+R4$

$Rs=0.2+0.4+0.6+0.8=2\Omega$ 2 Ω

Now the power is given by,

$P=(V^2)/R$

$P=(20^2)/2=400/2=200$Watt

Thus, the power in the circuit is 200 Watt.

Q69. Answer: (b) Rohit Sharma

The correct answer is Rohit Sharma.

Key Points

• Rohit Sharma, the captain of India, became the first captain in the history of cricket to win 13 straight T20Is.

• This accomplishment was made by Rohit Sharma in Southampton's first T20I of a three-match series against England.

• Indian cricketer Rohit Gurunath Sharma, who was born on April 30, 1987, currently serves as the team's captain.

• One of the greatest opening batters in history. For his timing, eloquence, six-hitting prowess, and leadership, Rohit Sharma is renowned.

• In both domestic cricket and the IPL, he bats right-handedly for Mumbai Indians and Mumbai.

• In a single World Cup, Rohit Sharma holds the record for most 100-point performances.

• The Mumbai Indians, who are the most successful team in the history of the event, are also captained by Rohit Sharma in the IPL.

Additional Information

• Virat Kohli

• Right-handed batter Virat Kohli competes for Royal Challengers Bangalore in the IPL and for Delhi in domestic cricket in India. He is a former captain of the Indian national cricket team and an international player from India.

• He is recognised as one of cricket's all-time great batsmen. He is second among cricket batsmen in terms of the most hundreds scored in international play.

• Babar Azam

• Pakistan's national cricket squad in all formats is captained by Mohammad Babar Azam, an international cricketer from Pakistan. He is regarded as one of the best batters in modern cricket and the only player in the world to rank in the top five in every format.

• He is ranked as the best batter in ODIs, fifth in Tests, and fourth in T20 Internationals.

• Mahendra Singh Dhoni

• Mahendra Singh Dhoni, sometimes referred to as MS Dhoni is a former Indian cricketer who played as a wicket-keeper.

• He served as captain of the Indian national team in limited-overs forms from 2007 to 2017 and in Test cricket from 2008 to 2014. Additionally, he serves as Chennai Super Kings' current captain in the Indian Premier League.

Q70. Answer: (a) 243

The pattern followed here is :

Hence, the correct answer is "Option 1"

Q71. Answer: (b) 63/2

Shortcut Trick

Using the empirical relationship: Mode = 3 × Median − 2 × Mean

=> 2 × Mean = 3 × Median − Mode

=> 2 × Mean = 3(12) − 15 = 36 − 15 = 21

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=> Mean = 21/2

=> 3 × Mean = 3 × (21/2) = 63/2

Therefore The correct answer is 63/2.

Alternate Method

Given:

Median (M) = 12

Mode (Mo) = 15

Formula Used:

The relationship between Mean (μ), Median, and Mode for a moderately skewed distribution is:

Mean − Mode = 3(Mean − Median)

Calculations:

=> Mean − 15 = 3(Mean − 12)

=> Mean − 15 = 3 × Mean − 36

=> 36 − 15 = 3 × Mean − Mean

=> 21 = 2 × Mean

=> Mean = 21/2 = 10.5

We need to find the value of thrice the mean:

=> 3 × Mean = 3 × (21/2)

=> 3 × Mean = 63/2

Therefore The correct answer is 63/2.

Additional Information

Empirical Formula

For a moderately skewed distribution, Mode = 3 × Median − 2 × Mean. This is also known as Karl Pearson's empirical relationship.

Symmetrical Distribution

In a perfectly symmetrical distribution (like Normal Distribution), the Mean = Median = Mode.

Skewness Property

If Mean > Median > Mode, the data is positively skewed. If Mode > Median > Mean, the data is negatively skewed.

Q72. Answer: (a) Second to the left.

G, H, I, J, K and L are six friends sitting around a circular table facing the centre.

1) H is seated second to the left of L

\

2) I is an immediate neighbour of both L and J.

3) K is not the immediate neighbour of J.

\

I's position from G is Second to the left.

Hence, the correct answer is "Option 1"

Q73. Answer: (b) (height of an image)/(height of an object)

The correct answer is (height of an image)/(height of an object)

Key Points

• The enlargement of the picture created by spherical mirrors in relation to the size of the object is known as magnification.

• It is represented by the symbol m and represents the height of the image in relation to the height of the object.

• A spherical mirror's magnification (m) can be represented as follows:

• m = h′ / h, where h′ is the image's height and h is the object's height.

• Additionally, it is equivalent to the opposite of the image distance (v) to object distance ratio (u).

• m = −v / u

• Convention dictates that the distance between objects is always negative. When a mirror is used, real images are created in front of the mirror, and virtual images are created behind the mirror.

• Therefore, the correct answer is: (height of an image)/(height of an object)

Additional Information

• Our ability to judge the size of the produced picture in relation to the object is aided by magnification. It explains whether the image created when an object is placed at various places on the primary axis is magnified, decreased, or equal to the object.

• The magnification that is positive denotes a virtual and erect image.
• The real and inverted image is shown by a negative magnification magnitude.

Q74. Answer: (d) 392

Logic : The difference between the first and second numbers is 103
231 : 334 → 334 - 231 = 103
Similarly,
289 : 392 → 392 - 289 = 103
And
319 : 422 → 422 - 319 = 103
Hence, the correct answer is "Option 4"

Q75. Answer: (c) 1

Given series : (Left) 5 3 4 7 2 8 6 5 3 9 4 2 6 8 9 5 (Right)
The logic followed here is:
Even number → Odd number → Even number
Even number : A number that is divisible by 2
Odd number : A number that cannot be divide by 2 evenly.
5 3 4 7 2 8 6 5 3 9 4 2 6 8 9 5
There is only 1 odd numbers which is immediately preceded by an even number and also immediately followed by an even number.
Hence, the correct answer is "Option 3"

Q76. Answer: (c) Rs. 18,000.00

Shortcut Trick
Let the Cost Price (CP) be 100%.
Profit% = 8%, so Selling Price (SP) = 100% + 8% = 108%.
Given SP = Rs. 19,440. Therefore 108% = 19,440.
Unitary Method: 1% = 19,440 ÷ 108 = 180.
CP = 100% = 180 × 100 = Rs. 18,000.
Therefore The correct answer is Rs. 18,000.00.
Alternate Method
Given: Selling Price (SP) = Rs. 19,440 | Profit% = 8%
Formula: Cost Price (CP) = [SP ÷ (100 + Profit%)] × 100
=> CP = [19,440 ÷ (100 + 8)] × 100
=> CP = [19,440 ÷ 108] × 100
=> CP = 180 × 100
=> CP = Rs. 18,000
Therefore The correct answer is Rs. 18,000.00.
Additional Information
Relationship between SP and CP
When there is a profit, SP is always greater than CP. Formula: SP = CP + Profit.
Profit Percentage
Profit% is always calculated on the Cost Price unless specified otherwise. Formula: Profit% = (Profit ÷ CP) × 100.

Q77. Answer: (a) Ganga

The correct answer is Ganga.
Key Points
• Son River, often written Sone, is the main Ganges (Ganga) River tributary in the state of Madhya Pradesh in central India.
• After passing Manpur to the north, it bends to the northeast.
• The river travels 487 miles (784 km) across the Kaimur Range before joining the Ganges above Patna.
• Central India is home to the Son River a perennial river.
• It starts near Amarkantak Hill in the Chhattisgarh district of Gaurela-Pendra-Marwahi, and eventually, it joins the Ganges River

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close to Patna, Bihar.

• After the Yamuna River, the Sone River is the Ganges' second-largest tributary in the South.

Additional Information

• Mahanadi

• In East Central India, the Mahanadi River is a significant river. It is the world's longest earthen dam. It has a length of 900 miles overall and drains an area of around 132,100 square kilometres.

• The Hirakud Dam, the first significant multifunctional river valley project following India's independence in 1947, is another reason for the fame of Mahanadi.

• Narmada

• The Narmada River, also known as the Reva and formerly as Narbada or Nerbudda in English, is the fifth-longest river in India and the longest west-flowing river altogether. It is also the state of Madhya Pradesh's greatest flowing river.

• This river traverses the Indian states of Gujarat and Madhya Pradesh. Due to its enormous contribution to the two states in numerous ways, it is also known as the "Lifeline of Madhya Pradesh and Gujarat."

• Godavari

• After the Ganga, the Godavari is the second-longest river in India. It empties into the third-largest basin, which makes up 10% of India's entire land area.

• Trimbakeshwar, in Nashik, Maharashtra, is where it originates. It drains the states of Maharashtra, Telangana, Andhra Pradesh, Chhattisgarh, and Odisha as it travels 1,465 kilometres to the east.

Q78. Answer: (b) 49.6%

Shortcut Trick

Net multiplier for successive discounts = (1 − d1/100) × (1 − d2/100) × (1 − d3/100).

Multiplier = (70/100) × (80/100) × (90/100) = 0.7 × 0.8 × 0.9 = 0.504.

Single Discount % = (1 − 0.504) × 100 = 0.496 × 100 = 49.6%.

Therefore The correct answer is 49.6%.

Alternate Method

Given → Successive Discounts of 30%, 20%, and 10%.

Formulas: Successive discount for two rates a and b = (a + b − ab/100)%.

=> Let Marked Price (MP) be 100.

=> First discount (30%) → Price = 100 − 30 = 70.

=> Second discount (20% of 70) → Price = 70 − 14 = 56.

=> Third discount (10% of 56) → Price = 56 − 5.6 = 50.4.

=> Net Discount = 100 − 50.4 = 49.6%.

Therefore The correct answer is 49.6%.

Additional Information

Successive Discounts

When a series of discounts are applied, the first discount is on the Marked Price, and subsequent discounts are on the reduced prices. Total Discount % = [1 − (1 − d1/100)(1 − d2/100)...] × 100.

Equivalence Formula

For two discounts x% and y%, single equivalent discount = (x + y − xy/100)%. For more than two, apply this result with the third discount.

Q79. Answer: (c) air spaces between soil particles

The correct answer is air spaces between soil particles.

Key Points

• The root cells, just like every other living cell in a plant, take in air from the gaps between soil particles.

• In addition to the leaves, the root system also contributes to plant respiration. Oxygen (O2) from the soil pores diffuses into the root hairs of root systems, where it is carried to all regions of the roots.

• During respiration, plant roots utilize photosynthates for a variety of purposes, including nutrition intake, tissue maintenance, and growth.

• The created carbon dioxide (CO2) is subsequently released into the soil, where it diffuses into the atmosphere via soil pores.

• Therefore, the correct answer is: air spaces between soil particles

Additional Information

• Plants, unlike people and other creatures, do not have any specialized structures for the exchange of gases; yet, the stomata in

their leaves and the lenticels in their stems are active participants in this process.

• Plants breathe 24 hours a day, although night breathing is more noticeable because photosynthesis has finished.

• The respiration rate rises as the nighttime temperature rises, which also causes a rise in temperature.

Q80. Answer: (d) Comptroller and Auditor General of India

The correct answer is Comptroller and Auditor General of India.

Key Points

• The current Comptroller and Auditor General (CAG) of India are Girish Chandra Murmu.

• The term "Comptroller and Auditor General" (CAG) refers to the official auditor general of India.

• The Indian Constitution's Articles 148 to 151 define this entity as an authority.

• According to Article 148 of the Indian Constitution, the Comptroller and Auditor General of India is known as the country's top auditing body.

• They have the authority to examine all monies received and spent by the Indian and state governments, as well as any autonomous organisations and businesses that get significant government funding.

Additional Information

• Solicitor General of India

• The Attorney General of India (AGI) is superior to the Solicitor General of India (SGI). They are the second-highest law enforcement official in the nation, and they work with Additional Solicitor Generals of India and the Attorney General.

• In accordance with the Law Officers (Conditions of Service) Rules, 1972, the SGI and the Additional SGIs advise the Government and represent the Union of India in court.

• Attorney General of India

• The Attorney General of India serves as both the government's top lawyer and its principal judicial representative.

• According to Article 76(1) of the Constitution, they are chosen by the Indian President at the request of the Union Cabinet and serve at the President's leisure.

• Chief Election Commissioner of India

• The Election Commission of India, a body with constitutional authority to oversee free and fair elections for the President and Vice-President, as well as for state and national legislatures, is headed by the Chief Election Commissioner of India. Article 324 of the Indian Constitution gives the Election Commission of India this authority.

Q81. Answer: (a) Neither conclusion (I) nor (II) follows.

The least possible venn diagram of given statement is :

\

Conclusions:

(I) All Rings are Noses. → False(some rings are noses not all as shown in figure above)

(II) Some Fingers are Ears.→ False(as there is no definite relation between fingers and ears)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 1"

Q82. Answer: (a) Side AB + Side BC > Side AC

Shortcut Trick

According to the Triangle Inequality Theorem, for any triangle to exist, the sum of the lengths of any two sides must be strictly greater than the length of the third side.

For triangle ABC, this fundamental property implies: AB + BC > AC, BC + AC > AB, and AC + AB > BC.

Therefore The correct answer is Side AB + Side BC > Side AC.

Alternate Method

Given: A triangle ABC with sides AB, BC, and AC.

Formula Used: Triangle Inequality Theorem.

=> In geometry, the shortest distance between any two points is always a straight line.

=> To travel from point A to point C, the direct straight path is the segment AC.

=> If we take an indirect path from A to C by going through point B, the total distance covered is AB + BC.

=> Since the indirect path must be longer than the direct straight path, we conclude that AB + BC > AC.

=> This rule applies to all three combinations of sides in any valid triangle.

Therefore The correct answer is Side AB + Side BC > Side AC.

Additional Information

Difference of Sides Property

The absolute difference between the lengths of any two sides of a triangle is always less than the length of the third side: |AB − BC| < AC.

Degenerate Triangle

If the sum of two sides is exactly equal to the third side (AB + BC = AC), the points A, B, and C are collinear, and they do not form a triangle.

Side-Angle Relationship

In any triangle, the longest side is always opposite the largest angle, and the shortest side is opposite the smallest angle.

Q83. Answer: (c) Macroeconomic Framework Statement

The correct answer is Macroeconomic Framework Statement.

Key Points

• In accordance with Section 3(5) of the Fiscal Responsibility and Budget Management Act of 2003, the Macroeconomic Framework Statement is delivered to Parliament.

• Along with a description of certain underlying assumptions, it offers an evaluation of the economy's growth prospects.

• It also includes an evaluation of the GDP growth rate, the domestic economy, the external sector's stability, the central government's fiscal balance, and the external sector's balance of payments.

Additional Information

• The Fiscal Responsibility and Budget Management Act of 2003 requires the Central Government to present the following fiscal policy statements to both Houses of Parliament each fiscal year, with the exception of the Medium-Term Expenditure Framework Statement:

(a) the Medium-Term Fiscal Policy Statement

(b) the Fiscal Policy Strategy Statement

(c) the Macro-economic Framework Statement; and

(d) the Medium-Term Expenditure Framework Statement.

• An assessment of the fiscal balance of the Central Government, price-related variations, GDP growth rate, and the external sector balance of the economy are all included in the Macroeconomic Framework Statement, which gives a broad overview of the economy.

Q84. Answer: (d) 32400 J

The correct answer is 32400J

Given:

V=12V,I=3A and

the time t=15min=15*60=900seconds.

To find:

Energy (E)

Formula:

Energy supplied is given by:

E=V*I*t

Calculations:

As, the formula is E=V*I*t,

Substituting the values we get:

E=12*3*900=32400J

Therefore, the energy supplied is 32400J.

Q85. Answer: (b) Only conclusion (I) follows.

The least possible Venn diagram of given statement is:

\

Concussions:

(I) Some Waters are Mosquitoes. → True(as some water are stagnant and all stagnant are mosquitoes)

(II) Some Rivers are Stagnant.→ False(as there is no definite relation between rivers and stagnant)

Only conclusion (I) follows.

Hence, the correct answer is "Option 2"

Q86. Answer: (c) 25

Anshu ranks from top = 19

The students who are ranked after Anshu = 6

Total students who gave the test = 19 + 6 = 25

Hence, the correct answer is "Option 3"

Q87. Answer: (a) 181

Shortcut Trick

To convert a recurring decimal like 0.0216 to a fraction:

Numerator = (Entire number) − (Non-recurring part) = 216 − 0 = 216

Denominator = Put '9' for each recurring digit and '0' for each non-recurring digit after the decimal = 9990

Fraction = 216/9990 = 4/185 (in lowest terms)

Difference = 185 − 4 = 181

Therefore The correct answer is 181.

Alternate Method

Given: Decimal value = 0.0216

Formula Used: Pure recurring decimal to fraction conversion rules.

=> Let x = 0.0216216216...

=> 10x = 0.216216216...

=> 10000x = 216.216216...

=> Subtracting (1) from (2): 9990x = 216

=> x = 216 ÷ 9990

=> Simplify by 54: x = (54 × 4) ÷ (54 × 185) = 4/185

=> Numerator = 4, Denominator = 185

=> Difference = 185 − 4 = 181

Therefore The correct answer is 181.

Additional Information

Recurring Decimal Rule

For a mixed recurring decimal, the denominator consists of as many 9s as there are repeating digits followed by as many 0s as there are non-repeating digits after the decimal point.

Lowest Terms

A fraction is in lowest terms when the Highest Common Factor (HCF) of the numerator and denominator is 1.

Conversion Formula

Fraction = (Complete number − Non-repeating part) ÷ (9 for each repeating digit, 0 for each non-repeating decimal digit).

Q88. Answer: (b) 294

Formula used:

BODMAS

B	Bracket	(),{},[]
O	Of	Of
D	Division	÷
M	Multiplication	×
A	Addition	•
S	Subtraction	•

Calculation:

[{(9261)^(1/3) ÷ 81^(1/4)}² × 4√1296]

=>[{ (21³)^(1/3) ÷ 3^4^(× 1/4)}² × 6^(4 × 1/4)]

=> [{21/3}² × 6]

=> [49 × 6] = 294

Hence, the required value is 294.

Q89. Answer: (a) Gokulam Kerala FC

The correct answer is Gokulam Kerala FC.

Key Points

• By defeating East Bengal in the semifinals and Mohun Bagan in the championship, Gokulam Kerala won the 2019 Durand Cup.

• In the final game of the 2021–22 I–League, they also triumphed over Mohammedan to secure their second straight league championship.

• Gokulam Kerala FC defeated Mohammedan Sporting of Kolkata to win the I-League championship once again.

• The I-League, which was founded in 2007, is the professional league for the Indian Men's Association football clubs.

• For Gokulam Kerala FC, Rishad and Emil Benny scored goals, while Marcus Joseph scored the sole goal for the opposing club.

Additional Information

• Mohammedan Sporting

• Mohammedan Sporting Club is a multi-sports organisation with its headquarters in Kolkata, West Bengal. Its football squad competes in the Calcutta Football Competition (CFL), the oldest football competition in Asia, as well as the I-League, the second tier of Indian football.

• It is one of the nation's oldest functioning football clubs and was founded in February 1891.

• Rajasthan FC

• The Indian professional football team Rajasthan United FC is in its fifth season, and this will be its second I-League campaign. Rajasthan United will take part in the Durand Cup and the Super Cup in addition to the I-League.

• RoundGlass Punjab

• Established in 2005 as Minerva Academy FC, RoundGlass Punjab FC is a professional football team with its home base in Mohali, Punjab.

• The academy-based club changed its name to Minerva Punjab FC in 2016, and the football division of the club changed its name to Punjab FC in 2019.

Q90. Answer: (c) Tata Institute of Fundamental Research (TIFR)

The correct answer is Tata Institute of Fundamental Research (TIFR).

Key Points

• Homi J. Bhabha, who was well-known for his work on the Indian atomic energy programme, wrote to the Sir Dorabji Tata Trust in 1944 to ask for financial support to build a research institute Tata Institute of Fundamental Research (TIFR).

• With the construction of research centres in Ooty and the Kolar gold mines, TIFR rose to prominence in the 1950s in the field of cosmic ray physics.

Additional Information

• In Mumbai, India, the Tata Institute of Fundamental Research (TIFR) is a public deemed research university devoted to conducting fundamental research in the natural and social sciences.

• It functions as a Deemed University and is overseen by the Indian government's Department of Atomic Energy.

• It is situated in Navy Nagar, Colaba, Mumbai, and has an affiliated campus in Serilingampally, close to Hyderabad, as well as an International Centre for Theoretical Sciences (ICTS) campus in Bangalore.

• Research in the natural sciences, mathematics, biological sciences, and theoretical computer science are the main areas of focus at TIFR.

Q91. Answer: (a) V

R, S, T, U, V and W live on six different floors of the same building.

1) Only one person lives above S.

Floors	Person
6	
5	S
4	
3	
2	
1	

2) Only two people between T and W.

3) T does not live on the topmost floor.

Floors	Person
6	
5	S
4	T/W
3	
2	
1	T/W

3) U lives immediately below T

4) U lives immediately above V.

5) Neither U nor V lives on the lowermost floor.

Floors	Person
6	R
5	S
4	T
3	U
2	V
1	W

V lives on floor number 2.

Hence, the correct answer is "Option 1"

Q92. Answer: (b) 13 1/9

Shortcut Trick

Total work (LCM of 10, 15, 9/2) = 90 units.

Efficiencies: A = 9, B = 6, A+B+C = 20 => C = 5.

Working (C then A): 2nd day cycle (5+9) = 14 units.

In 12 days (6 cycles), work done = 14 × 6 = 84 units. Remaining = 6 units.

Day 13 (C) does 5 units. Remaining = 1 unit done by A in 1/9 day.

Therefore The correct answer is 13 (1)/(9) days.

Alternate Method

Given: A = 10 days, B = 15 days, A + B + C = 4 (1/2) days = 9/2 days.

Formula Used: Efficiency = Total Work ÷ Time Taken

Person	Days	Total Work	Efficiency
A	10	90	9
B	15	6	
A+B+C	9/2	20	

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

=> Efficiency of C = 20 − (9 + 6) = 20 − 15 = 5 units/day.

=> Working sequence: Day 1 (C), Day 2 (A), Day 3 (C), Day 4 (A)...

=> Work in 1st cycle (2 days) = 5 + 9 = 14 units.

=> Work in 6 cycles (12 days) = 14 × 6 = 84 units.

=> Remaining work = 90 − 84 = 6 units.

=> On 13^(th) day, C works: Work done = 5 units. Remaining work = 6 − 5 = 1 unit.

=> On 14^(th) day, A works: Time taken = 1/9 day.

=> Total time = 12 + 1 + 1/9 = 13 (1/9) days.

Therefore The correct answer is 13 (1)/(9) days.

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Additional Information

Alternate Day Work

In alternate day problems, calculate the total work done in one complete cycle of rotation before finding the number of cycles required.

Efficiency and Time

Efficiency is inversely proportional to time. If A is twice as efficient as B, A will take half the time taken by B to complete the same work.

Work and Wages

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

Q93. Answer: (d) 3, 4, 4

The correct answer is 3,4,4.

Given:

An unbalanced reaction $xFe(s) + yH2O(g) \rightarrow Fe3O4 + zH2(g)$.

To find:

The values of x, y and z.

Calculations:

Writing the unbalanced equation:

$xFe(s) + yH2O(g) \rightarrow Fe3O4 + zH2(g)$.

By comparing the number of reactants and products in the reaction,

There are 3 atoms of Fe in product side so reactant should have 3 atoms of Fe. Thus, x = 3.

There are 4 atoms of O in product side so reactant should have 4 atoms of Fe. Thus, y = 4.

There are 4 atoms of H2 in reactant side so product should have 4 atoms of H2. Thus, z = 4.

Therefore, the correct combination is 3,4 and 4.

Q94. Answer: (a) 18th group

The correct answer is 18th group.

Key Points

• Given that the given element has an electronic configuration of 2,8,8, which means that its valency is completely full and is a noble or inert element, its outermost orbit is complete.

• The element having electronic configurations 2, 8, 8 possesses a complete octet. It is therefore a noble gas. Along with the other noble gases, it will be located in group 18.

• The valence shell orbitals of the elements in Group 18 are entirely filled. As a result, they only react with a few substances under specific circumstances. As a result, they are referred to as noble gases.

• Therefore, the element 'x' is placed in the 18th group.

Additional Information

• According to the octet rule, atoms are most stable when eight electrons are present in each valence shell.

• It is based on the observation that the atoms of the main group elements tend to form chemical bonds that result in each atom having eight electrons in the valence shell of the subsequent molecule. Only the principal group elements are covered by the law of the octet.

• It is thought that the halogens, oxygen, nitrogen, and carbon molecules adhere to the octet laws. The s-block and p-block elements are frequently those that adhere to this law.

Q95. Answer: (b) The two alleles are brought together at the time of gamete formation

The correct answer is The two alleles are brought together at the time of gamete formation.

Key Points

• Statement 2: False

• The two alleles are brought together at the time of gamete formation - The second inheritance law is known as the law of segregation. According to this law, a pair of alleles separate from one another during the meiotic cell division process, also known as gamete formation, resulting in a gamete containing a single copy of an allele.

• Four fundamental ideas form the basis of the law of segregation:

• A gene can take on different allele forms.

• Allelic pairings split apart during meiosis, resulting in each gamete having just one allele.

• Each attribute in an organism is inherited from two different alleles.

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• A pair of alleles has two distinct alleles, one of which is dominant and the other recessive.

• Therefore, the correct answer is: The two alleles are brought together at the time of gamete formation.

Additional Information

• Statement 1: True

• Each gene controls one character - Generally speaking, one gene affects just one phenotype or attribute. The inheritance of each of these phenotypic qualities behaves as if it were controlled by a single gene, despite the fact that other genes are undoubtedly involved.

• Statement 3: True

• Every germ cell will take one chromosome from each pair - Each germ cell will accept one chromosome from each pair; these can come from either the mother or the father. When two germ cells join, they will reestablish the normal amount of chromosomes in the progeny, maintaining the stability of the species' DNA.

• Statement 4: True

• Genes are located on chromosomes - Chromosomes, which are found in the cell nucleus, are where genes are found. There are hundreds to thousands of genes on each chromosome. There are 46 chromosomes in all, or 23 pairs, in each typical human cell.

Q96. Answer: (c) 64

Interchanging '+' and '-' and '×' and '÷'

Given equation : 15 ÷ 3 - 10 × 2 ÷ 18 × 6 - 4

After interchanging and using the BODMAS rule we get,

15 × 3 +10 ÷ 2 × 18 ÷ 6 + 4

15 × 3 + 5 × 3 + 4

45 + 15 + 4

64

Hence, the correct answer is "Option 3"

Q97. Answer: (c) 1 - 3 $\sin^2\theta \cos^2\theta$

Shortcut Trick

Substitute θ = 90° into the given expression.

sin^6 90° + cos^6 90° = (1)^6 + (0)^6 = 1.

Now check the expression $1 - 3\sin^2\theta\cos^2\theta$ with θ = 90°.

$1 - 3(1)^2(0)^2 = 1 - 0 = 1$ (Matches the given expression).

Therefore The correct answer is $1 - 3\sin^2\theta\cos^2\theta$.

Alternate Method

Given: sin^6 θ + cos^6 θ

Formula Used: $a^3 + b^3 = (a + b)^3 - 3ab(a + b)$ and $\sin^2\theta + \cos^2\theta = 1$

$\Rightarrow (\sin^2\theta)^3 + (\cos^2\theta)^3$

$\Rightarrow (\sin^2\theta + \cos^2\theta)^3 - 3(\sin^2\theta)(\cos^2\theta)(\sin^2\theta + \cos^2\theta)$

$\Rightarrow (1)^3 - 3\sin^2\theta\cos^2\theta\ (1)$

$\Rightarrow 1 - 3\sin^2\theta\cos^2\theta$

Therefore The correct answer is $1 - 3\sin^2\theta\cos^2\theta$.

Additional Information

Trigonometric Pythagorean Identities

The core identities include $\sin^2\theta + \cos^2\theta = 1$, $\sec^2\theta - \tan^2\theta = 1$, and $\text{cosec}^2\theta - \cot^2\theta = 1$.

Expression for Fourth Power

Using the square of the sum, sin^4 θ + cos^4 θ can be simplified to $1 - 2\sin^2\theta\cos^2\theta$.

Algebraic Cubes Identity

The sum of cubes $x^3 + y^3$ is factored as $(x + y)(x^2 - xy + y^2)$ or written as $(x + y)^3 - 3xy(x + y)$.

Q98. Answer: (a) Cash transfer through DBT at the time of marriage of beneficiary girl

• The correct answer is cash transfer through DBT at the time of marriage of beneficiary girl.

• Key PointsThe following objectives are intended to be attained by the Beti Bachao Beti Padhao Yojana:

• Improve the child-sex ratio

• Ensure women's empowerment and gender equality

• Prevent sex-selective and gender-biased exclusion

• Ensure the girl child's survival and safety

• Encourage girls of the country to attend school and participate in society

• Additional Information

• The Beti Bachao, Beti Padhao (BBBP) programme has been launched by the government of India in 2015 to address issues with gender inequality and women's empowerment in the nation.

• The phrase "Save the girl child, educate the girl kid" is the meaning behind the name of this initiative Beti Bachao, Beti Padhao.

• The programme mainly aims to increase the effectiveness of welfare services for girls and educate the public about gender bias.

• Rs. 100 crore ($13.5 million) in initial money was used to launch this programme.

Q99. Answer: (b) Oxidation

The correct answer is Oxidation.

Key Points

• When magnesium ribbon is burned in the presence of oxygen, magnesium reacts to generate magnesium oxide.

• The metal magnesium is very active. When magnesium and oxygen interact, magnesium oxide is created as a result of Oxidation.

• Combination reactions are the name given to such reactions.

• Because it produces magnesium hydroxide when dissolved in water, magnesium oxide is basic in composition.

• The color of the red litmus solution turns blue when magnesium oxide is added.

• The following happens as a result:

• $2Mg+O2 \rightarrow 2MgO$

• Therefore, the correct answer is: Oxidation

Additional Information

• Hydrogenation:

• Molecular hydrogen and another element undergo a chemical reaction known as hydrogenation, typically in the presence of a catalyst like nickel, palladium, or platinum.

• The method is frequently used to saturate or decrease organic molecules.

• Decomposition:

• The process of recycling nutrients that have been consumed by an organism to create its body begins with decomposition.

• It is the process through which the dead tissues disintegrate and change into more basic organic forms.

• Many creatures eat them as their primary source of nutrition.

• Reduction:

• Any of a range of chemical reactions known as reductions increases the number of electrons attached to an atom or group of atoms.

• Another substance, which is oxidized as a result, supplies the electrons that are taken up by the reduced molecule.

Q100. Answer: (a) 3

Given series : (Left) H A D W V Q T S P E R S T K E L M T (Right)

The logic followed here is :

Consonant → Vowels → Consonant

H A D W V Q T S P E R S T K E L M T

There are 3 vowels which is immediately preceded by a consonant and also immediately followed by a consonant.

Hence, the correct answer is "Option 1"

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