RRB Group D Previous Year Paper (Held on: 28 Sept 2022 Shift 3)

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

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CBT

Q1. Simplify 3x(x + 2) - 5x(x - 3) + 7.

(a) $2x^2 + 21x + 7$
(b) $2x^2 + 11x + 7$
(c) $-2x^2 + 21x + 6$
(d) $-2x^2 + 21x + 7$

Q2. 'Equality of opportunity in matters of public employment' as a Fundamental Right in the Indian Constitution is given in which Article of the Constitution ?

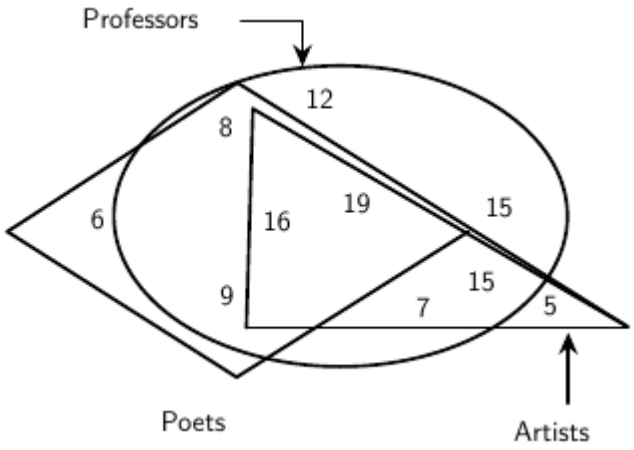
(a) Article 14
(b) Article 16
(c) Article 17
(d) Article 15

Q3. Find the mode of the following data.

2, 6, 5, 2, 4, 9, 6, 2, 66, 4, 10, 12, 6, 22, 2, 44, 9

(a) 4
(b) 6
(c) 9
(d) 2

Q4. Observe the given diagram carefully and answer the question that follows. The numbers in different sections indicate the number of persons.



How many such persons are there in the above group who are not artists and poets but are only professors ?

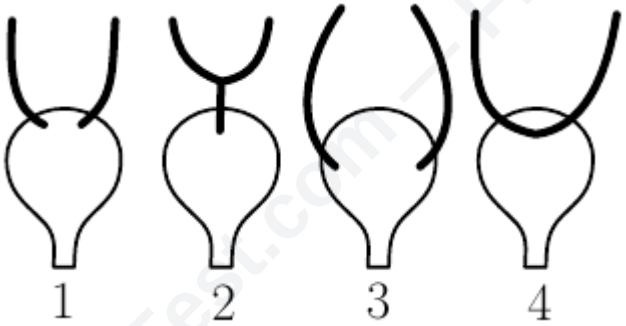
(a) 27
(b) 35
(c) 17

(d) 22

Q5. What is the name of India's first privately developed fully cryogenic rocket engine ?

(a) Bhabha- 1
(b) Sarabhai- 1
(c) Kalam- 1
(d) Dhawan- 1

Q6. Which of the following diagrams depicts the positions of the ureters (shown as blue lines) and the urinary bladder in the human excretory system?



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

Q7. The magnetic field produced by a current-carrying conductor decreases as the _____ increases.

(a) distance
(b) current
(c) voltage
(d) resistance

Q8. Refer to the given number, and symbol series and answer the question that follows.

(Left) ¥ 1 λ 2 5 $ 2 # 1 & 2 3 € 1 5 6 % ¥ 2 @ 6 (Right)

How many such symbols are there, each of which is immediately preceded by a symbol and also immediately followed by a number?

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

Q9. While playing a game, P is standing to the south of D, who is to the west of A, who is to the north of J. If P exchanges his position with A, then what is the direction of J with respect to P?

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

Q10. Which is the first Indian mosque ?

(a) Palaiya Jumma Palli
(b) Ziarat Shareef
(c) Malik Dinar Mosque
(d) Cheraman Juma Mosque

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Q11. In which part of the human body are villi present?

(a) Eye
(b) Kidney
(c) Liver
(d) Small intestine

Q12. P, Q, R, S, T and U are six friends sitting around a circular table, facing the centre of the table in a cafe. S is seated third to the right of U. Q is the immediate neighbour of U and P. T is seated to the immediate left of S. Who are the immediate neighbours of R ?

(a) T and S
(b) Q and U
(c) U and T
(d) P and S

Q13. Three resistors of 12 ohms, 16 ohms and 48 ohms are connected in parallel. What is the net resistance?

(a) North
(b) 6 ohm
(c) 76 ohm
(d) 1/76 ohm

Q14. In Assembly Election 2022, how many seats did Aam Aadmi Party win in Punjab ?

(a) 93
(b) 95
(c) 94
(d) 92

Q15. The Ministry of Labour and Employment has developed eSHRAM portal for _____.

(a) creating a National Database of Public Sector Undertakings Workers (NDPSUW)
(b) creating a National Database of Government Workers (NDGW)
(c) creating a National Database of Organised Workers (NDOW)
(d) creating a National Database of Unorganised Workers (NDUW)

Q16. In which of the following states in India is the largest mass nesting site for the Olive-ridley Turtles found ?

(a) Tamil Nadu
(b) Odisha
(c) Kerala
(d) Gujarat

Q17. This question consists of a statement followed by two arguments I and II. Read the statement and the arguments carefully and select the appropriate answer from the given options.

Statement:

Eating junk food is not good for health.

Arguments:

I. Junk food has high amount of fats, chemical additives and sodium leading to obesity.

II. High intake of sugars and fats tend to suppress the function of the brain that helps in learning and memory formation.

(a) Both I and II weaken the statement.
(b) Both I and II strengthen the statement.
(c) I weakens while II strengthens the statement.
(d) II weakens while I strengthens the statement.

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Q18. The refractive index of a material can be linked with relative _____ of propagation of light in different media.

(a) speed
(b) acceleration
(c) force
(d) displacement

Q19. The roots of the quadratic equation x + 20/x = 9 are:

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

Q20. Which of the following numbers will replace the question mark (?) in the given series ?

3 11 20 28 37 ?

(a) 45
(b) 55
(c) 54
(d) 44

Q21. Which of the following numbers will replace the question mark (?) in the given series ?

240, 240, 120, 40, 10, ?

(a) 5
(b) 8
(c) 2
(d) 1

Q22. A has a certain amount of money and B also has some money. If A gives Rs. 130 to B, then B will have 1.5 times the amount left with A. Instead, if B gives Rs. 70 to A, then A will have 2 times the amount left with B. What is the total amount of money that A and B together have between them ?

(a) Rs. 750
(b) Rs. 720
(c) Rs. 780
(d) Rs. 700

Q23. Which of the following is a saturated hydrocarbon ?

(a) Acetylene
(b) Ethane
(c) Benzene
(d) Ethene

Q24. Nilesh bought some quantity of barley for Rs. 5,000. Half of it is sold at a profit of 20%. If Nilesh wishes to make a profit of 15% on the whole, find the selling price (in Rs.) of the remaining barley.

(a) 3,000
(b) 3,250
(c) 2,500
(d) 2,750

Q25. Which two numbers from amongst the given options should be interchanged to make the given equation correct ?

87 × 122 - 369 - 13 ÷ 2 = 701

(a) 369 and 2
(b) 87 and 2
(c) 122 and 13
(d) 87 and 13

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Q26. In a row of people standing in a waiting area, facing North, Hari stands seventh from the left end of the row and there are three people between him and the person standing at the exact centre of the row. How many people are standing in the row ?

(a) 18
(b) 20
(c) 21
(d) 15

Q27. Sexual reproduction in human beings involves the introduction of sperm in the vagina of the female. Where does fertilisation occur ?

(a) In the uterus
(b) In the cervix
(c) In the vagina
(d) In the fallopian tube

Q28. The physical quantity having a unit of volt/ampere is _____.

(a) work
(b) charge
(c) current
(d) resistance

Q29. Which of the following is the only permanent unit in the Panchayati Raj System ?

(a) Nagar Panchayat
(b) Panchayat Samiti
(c) Zila Parishad
(d) Gram Sabha

Q30. Which mineral ore's deposits are formed by the decomposition of a wide variety of rocks rich in aluminium silicates ?

(a) Alumina
(b) Manganese
(c) Bauxite
(d) Iron

Q31. The following bar graph shows the number of coolers sold by shopkeepers A and B in different years. Study the graph and answer the question that follows.



The total number of coolers sold by shopkeeper B in 1995 and 1998 together is approximately what percentage more/less than the total number of coolers sold by the shopkeeper A in 1996 and 1997 together ?

(a) 4% more
(b) 4% less
(c) 6% less
(d) 6% more

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Q32. A tank is attached with 30 pipes, some of these are filling pipes and the rest are emptying pipes. Each filling pipe can fill the tank completely in 24 hours and each emptying pipe can empty the tank completely in 18 hours. When all the pipes are opened together, it takes 11/2 hours to fill the tank completely. How many of the given pipes are emptying pipes ?

(a) 9
(b) 8
(c) 12
(d) 6

Q33. In a certain code language, 'TRAMP' is written as 'VOCJR' and 'BLANK' is written as 'DICKM'. How will 'AMPLE' be written in that language?

(a) DJSIH
(b) CJRIG
(c) BOSPJ
(d) CIRHG

Q34. In the word 'BACKGROUND', if each vowel is changed to the letter immediately following it and each consonant is changed to the letter immediately following it in the English alphabetical order, then how many vowels will be there in the group of letters thus formed?

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

Q35. If a solid sphere of radius 10 cm is melted into 8 spherical solid balls of equal radius, then what will be the surface area of each such ball ? [Use π = 22/7]

(a) 319 1/7 cm^2
(b) 314 2/7 cm^2
(c) 335 5/7 cm^2
(d) 324 3/7 cm^2

Q36. In the given letter-cluster pairs, the first letter-cluster is related to the second letter-cluster following a certain logic. Study the given pairs carefully, and from the given options, select the pair that follows the same logic.

RTO : OQL

KMD : HJA

(a) ABC : XWZ
(b) LOP : IUY
(c) JHG : FDS
(d) UBF : RYC

Q37. Which of the following statement is INCORRECT for reduction ?

(a) Gain of electrons
(b) Addition of Hydrogen
(c) Removal of oxygen
(d) Loss of electrons

Q38. The compound interest on Rs. 30,000 in 2 years at 7% rate of interest per annum compounded annually is:

(a) Rs. 4,347
(b) Rs. 2,347
(c) Rs. 3,347
(d) Rs. 3,777

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Q39. In an electric circuit, four equal resistors were in series, connected to a cell. These are now disconnected and connected back in parallel across the same cell. The ratio of current in the series circuit to the current in each resistor in the parallel circuit will be _____.

(a) 4 : 1
(b) 1 : 4
(c) 16 : 1
(d) 1 : 16

Q40. The centre of curvature of a concave mirror lies _____.

(a) below the mirror
(b) behind the mirror
(c) above the mirror
(d) in front of the mirror

Q41. If '+' means '×', '-' means '÷', '×' means '-', and '÷' means '+', what will come in place of the question mark (?) in the following equation ?

4 × 5 + 3 ÷ 16 - 1 = ?

(a) 10
(b) 5
(c) 12
(d) 8

Q42. If a coin is placed at the bottom of a tumbler of height 30 cm filled with water of refractive index 1.33, then the apparent depth of the coin appears to be:

(a) 25.7 cm
(b) 22.6 cm
(c) 39.9 cm
(d) 36.7 cm

Q43. A tradesman allows a discount of 15% on the marked price. How much above the cost price must he mark his goods to gain 19% through the above transaction ?

(a) 50%
(b) 40 %
(c) 25 %
(d) 30 %

Q44. The population of a town increased by 12% in the first year and by 16% in the second year. What is the percentage increase in the population at the end of the second year with respect to the population at the beginning of the given 2- year period ?

(a) 29.6 %
(b) 29.92 %
(c) 19.92 %
(d) 19.6 %

Q45. If each of the letters in the word 'LEUCOMA' is arranged in alphabetical order, how many letters are there in the English alphabetical order between the letters which is third from the left and the one which is second from the right?

(a) Ten
(b) Nine
(c) Eight
(d) Seven

Q46. Which of the following metals is less reactive than silver ?

(a) Hg
(b) Fe
(c) Au

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(d) Cu

Q47. 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 Bears are Teddies.

Some Rabbits are Teddies.

All Rabbits are Soft.

Conclusions:

(I) Some Rabbits are Bears.

(II) All Teddies are Soft.

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

Q48. The position of how many letters will remain unchanged if each of the letters in the word FLAGSTONE is arranged in alphabetical order ?

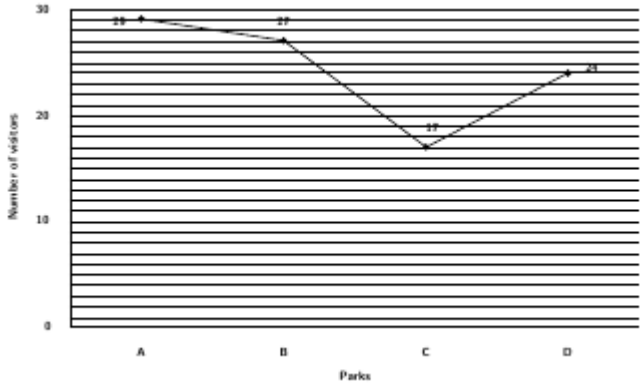
(a) None
(b) 2
(c) 1
(d) 4

Q49. If the measures of the angles of a quadrilateral taken in order are in the ratio 1 : 3 : 1 : 3, then the quadrilateral is a:

(a) parallelogram
(b) rectangle
(c) square
(d) trapezium, but not a parallelogram

Q50. Study the given line graph and answer the following question.

The given line graph depicts the number of visitors in four parks - A, B, C and D.



If out of the total number of visitors in parks A and C, 50% were females, what was the total number of male visitors in parks A and C ?

(a) 23
(b) 18
(c) 20
(d) 21

Q51. Select the combination of letters that when placed from left to right in the same sequence in the banks of the given series will complete the series.

_ _LMT_ _PLMT_KPL_ _ _KPLMT_

(a) KPTKTMTTT

(b) LPTKTMTTT
(c) KLTKTMTTT
(d) KPTKTMTTM

Q52. The homologue of ethanol is _____.
(a) propanal
(b) methanol
(c) ethanal
(d) ethane

Q53. Services e-Health Assistance and Teleconsultation (SeHAT) is a teleconsultation service launched by which of the following ministries ?
(a) Ministry of AYUSH
(b) Ministry of Defence
(c) Ministry of Home Affairs
(d) Ministry of Women and Child Development

Q54. Who started the Mahila Seva Mandal to promote women's rights in 1852 ?
(a) Savitribai Phule
(b) Ramabai Ranade
(c) Annie Besant
(d) Sarojini Naidu

Q55. In a certain code language, 'PEN' is written as 'KVM' and 'CAN' is written as 'XZM'. How will 'GUN' be written in that code language ?
(a) TDM
(b) TMF
(c) FMT
(d) TFM

Q56. Which of the following chemicals are known to deplete the ozone layer in the atmosphere ?
(a) NO_2
(b) SO_2
(c) CO
(d) CFCs

Q57. A man spends 30% of his salary on groceries, and is left with Rs. 3,500. Find his total salary.
(a) Rs. 11,000
(b) Rs. 6,000
(c) Rs. 5,000
(d) Rs. 5,500

Q58. Select the option that is related to the fifth number in the same way as the second number is related to the first number and the fourth number is related to the third number.

7 : 42 :: 5 : 20 :: 11 : ?

(a) 117
(b) 90
(c) 110
(d) 132

Q59. If ' + ' means ' - ', ' - ' means ' × ', ' × ' means ' ÷ ', ' ÷ ' means ' + ', what will come in place of the question mark (?) in the following equation ?

25 × 5 ÷ 7 - 10 × 2 = ?

(a) 40
(b) 41

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(c) 38
(d) 39

Q60. A certain number of people are sitting in a straight line facing north. Only three people are sitting between D and I. There are only two people sitting between K and O. I is sitting to the immediate left of O. No one is sitting to the left of D. Only one person is sitting to the right of O. How many people are sitting in the row ?

(a) 6
(b) 7
(c) 8
(d) 5

Q61. 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 Cakes are Ice-Creams.

Some Cakes are Butters.

All Cakes are Eggs.

Conclusions:

(I) Some Butters are Ice-creams.

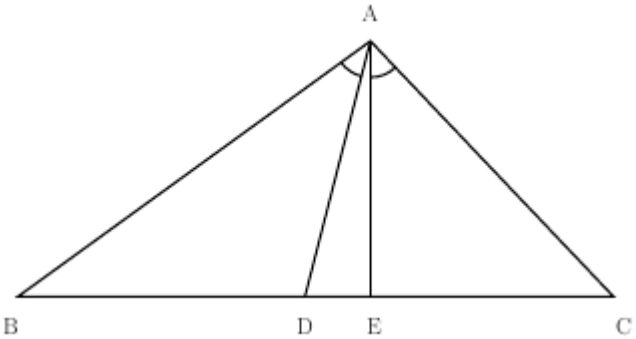
(II) All Eggs are Ice-creams.

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

Q62. An electric motor is a device used for converting electrical energy into _____ energy.

(a) mechanical
(b) Light
(c) Heat
(d) Magnetic

Q63. In a triangle ABC, if AD is the angle bisector of angle BAC, AE perpendicular to BC, angle B = 30° and angle C = 50°, then angle DAE is:



(a) 10°
(b) 20°
(c) 30°
(d) 40°

Q64. A statement is given below, followed by four conclusions given in the options. Find out which conclusion is true based on the given statement.

Statement: E ≤ D < K = A > P > Z

(a) P > D
(b) Z = E

(c) A ≥ Z
(d) A > E

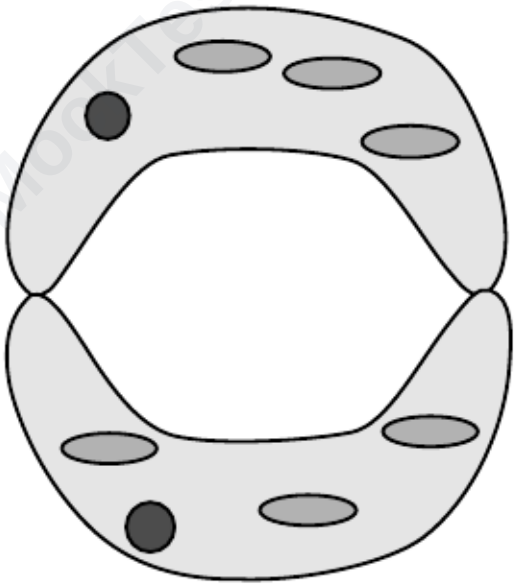
Q65. Six teachers are sitting around a circular table facing the centre. Ruhi is sitting second to the left of Sophie. Gautam is sitting third to the right of Dinesh. Preeti is an immediate neighbour of both Sophie and Gautam. Mary is sitting to the immediate left of Ruhi. Who is an immediate neighbour of both Ruhi and Sophie?

(a) Mary
(b) Preeti
(c) Gautam
(d) Dinesh

Q66. In Dobereiner's Triads, elements were written as:

(a) Moving from left to right with increasing atomic masses
(b) down the group with increasing atomic masses
(c) down the group with decreasing atomic masses
(d) Moving from left to right with decreasing atomic masses

Q67. Where can you find the type of cells shown in the following figure ?



(a) Leaves and shoots
(b) Stems and roots
(c) Roots and flowers
(d) Flowers and leaves

Q68. Nine years ago, P's age was twice the age of Q. If the ratio of their present ages is 5 : 4, what is the sum of their present ages ?

(a) 35 years
(b) 40 years
(c) 30 years
(d) 27 years

Q69. As of April 2022, how much FDI is permitted in railways under automatic route in construction, operation, and maintenance of Rail Infrastructure projects ?

(a) 49%
(b) 74%
(c) 100%
(d) 80%

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Q70. A mixture of sodium bicarbonate and a mild edible acid is known as _____.

(a) washing soda
(b) bleaching powder
(c) baking powder
(d) baking soda

Q71. The 'Hunar Haat' exhibition was organised in the Kota district of Rajasthan from 27 February to 7 March 2021 under the USTTAD scheme of the _____.

(a) Ministry of Minority of Affairs
(b) Ministry of Finance
(c) Ministry of Home Affairs
(d) Ministry of Skill Development and Entrepreneurship

Q72. In the year 2020, the Oriental Bank of Commerce (OBC) and the United Bank of India were merged with which of the following banks ?

(a) Bank of India
(b) Bank of Maharashtra
(c) State Bank of India
(d) Punjab National Bank

Q73. A statement is given followed by four conclusions as options. Select which conclusion is true based on the given statement.

Statement: Z > Q > L = J < R < P

(a) J < Z
(b) Q < P
(c) R > Z
(d) P < L

Q74. Which of the following is divisible by 17 ?

(a) 1887
(b) 2989
(c) 991
(d) 2022

Q75. Identify the correct statement(s) with respect to the reflection of light by a spherical mirror from among the following.

(a) A convex mirror can only form real and inverted images.

(b) A concave mirror can form real, inverted and virtual, erect images.

(c) Images formed by convex mirrors are either diminished, same size or enlarged depending on the position of object.

(d) Images formed by concave mirrors are either diminished, same size or enlarged depending on the position of the object.

(a) (a) and (c) are only correct
(b) (a) and (d) are only correct
(c) (b) and (d) are only correct
(d) (b) and (c) are only correct

Q76. A water tank can be filled in 9 minutes by using 15 pipes of the same capacity. In how many minutes will the water tank be filled if we use 20 pipes of the same capacity as above ?

(a) 10
(b) 6.75
(c) 13
(d) 18

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Q77. In which year was Tamil declared a classical language by the Government of India ?

(a) 2010
(b) 2004
(c) 2005
(d) 2014

Q78. Find x and y in the equivalent fraction given below.

x/9 = 105/63 = 5/y

(a) x = 15, y = 3
(b) x = 15, y = 9
(c) x = 3, y = 5
(d) x = 12, y = 3

Q79. The value of $\sqrt{((4 - 5\cos^2\theta)/(\sin^2\theta) + \cot^2\theta)}$ is:

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

Q80. Which of the following statements regarding blood pressure is FALSE ?

(a) The pressure is much greater in veins than in arteries.
(b) The pressure during ventricular contraction is called systolic pressure and during ventricular relaxation is called diastolic pressure.
(c) The normal systolic pressure is about 120 mm of Hg and diastolic pressure is 80 mm of Hg.
(d) The pressure is measured using a sphygmomanometer.

Q81. If $x = (\sqrt{1125} \times \sqrt{405})/\sqrt{729}$, then the value of $\sqrt{x}$ is:

(a) 9
(b) 25
(c) 5
(d) 3

Q82. In macroeconomic analysis, marginal propensity to save (MPS) is _____.

(a) the change in savings per unit change in income of an individual
(b) the savings per unit of a good
(c) the savings per unit change in the price of a good
(d) the savings per unit of income of an individual

Q83. A cyclist covered a distance of 900 km in 25 hours. What is the speed of the cyclist (in m/s) ?

(a) 10
(b) 11
(c) 8
(d) 9

Q84. If the difference between two numbers is 4 and their product is 32, then the absolute difference between their cubes is:

(a) 444
(b) 484
(c) 844
(d) 448

Q85. Select the set in which the numbers are related in the same way as are the numbers of the given 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 is not allowed)

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(1, 6, 4)

(3, 15, 9)

(a) (9, 25, 7)
(b) (3, 18, 8)
(c) (2, 16, 8)
(d) (10, 33, 11)

Q86. Which two elements were put in the same slot by Newland?

(a) Co and Ni
(b) Ca and Cu
(c) As and Se
(d) Na and Al

Q87. Express 0.2overline 7 in the form p/q, where p and q are integers and q ≠ 0.

(a) 2/9
(b) 5/18
(c) 1/6
(d) 1/3

Q88. Shalika walked 15 km towards south from her house, then she turned towards east and covered a distance of 10 km. She then turned north and covered a distance of 25 km. Finally turning west, she covered a distance of 15 km. In which direction is she from her house now?

(All turns are 90° turns only)

(a) South-east
(b) North-east
(c) North-west
(d) South-west

Q89. The product of the LCM and the HCF of 18 and 25 is:

(a) 465
(b) 450
(c) 270
(d) 360

Q90. If the radius and the height of a cylinder are 7 cm and 15 cm, respectively, then find the volume of the cylinder.

[Use π = 22/7]

(a) 2125 cm^3
(b) 2520 cm^3
(c) 2310 cm^3
(d) 2451 cm^3

Q91. A certain number of people are sitting in a row, facing north. B is sitting third to the right of C. No one is sitting to the left of C. Only four people are sitting between A and B. Only two people are seated to the right of D. Only four people are sitting between A and D. If no other person is sitting in the row, what is the total number of persons seated between C and D?

(a) 12
(b) 13
(c) 15
(d) 17

Q92. In June 2022, the 4^(th) Edition of the Khelo India Youth Games was inaugurated in the state of _____.

(a) North
(b) Haryana
(c) Madhya Pradesh
(d) Gujarat

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Q93. The reaction in which two reactants participate and produce only one product is called:

(a) combination reaction
(b) double displacement reaction
(c) dissociation reaction
(d) displacement reaction

Q94. To which of the following communities living in western Rajasthan on the border of the Thar desert has conservation of forest and wildlife been a religious tenet ?

(a) Vaishya Community
(b) Chhipa community
(c) Bishnoi community
(d) Bhil community

Q95. If α an β are the roots of the equation $x^2 + 5x + 6 = 0$, then the value of $\alpha\beta - (1/\alpha + 1/\beta)$ is:

(a) 31/6
(b) • 31/6
(c) • 41/6
(d) 41/6

Q96. Which of the following festivals is associated with Jharkhand ?

(a) Losar
(b) Saga Dawa
(c) Chavang Kut
(d) Tusu

Q97. What is covered under 'Maternal Health' ?

(a) Care of all new mothers (after childbirth)
(b) Care during pregnancy and childbirth
(c) Care of pregnant woman
(d) Care during prenatal, natal and post-natal period

Q98. After the formation of the Janata Party government at Centre, which of the following multinationals shut its India operations due to compliance issue with the Foreign Exchange Regulation Act that mandated foreign investors cannot own over 40% in Indian enterprises?

(a) Coca-Cola
(b) Unilever
(c) Nestle
(d) Colgate-Palmolive

Q99. PV Sindhu won a bronze medal in May 2022 in which of the following badminton tournaments ?

(a) Badminton Asia Championships 2022.
(b) Australian National Badminton Championships 2022
(c) Yonex Open 2022
(d) European Badminton Championships 2022

Q100. Taramati peak is located in:

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

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) $-2x^2 + 21x + 7$

Shortcut Trick

Identify the coefficients of like terms directly:

For x^2 terms: $3 - 5 = -2$

For x terms: $(3 \times 2) - (5 \times -3) = 6 + 15 = 21$

For constants: 7

Resulting expression: $-2x^2 + 21x + 7$

Therefore The correct answer is $-2x^2 + 21x + 7$.

Alternate Method

Given: $3x(x + 2) - 5x(x - 3) + 7$

Formula Used: Distributive Property: $a(b + c) = ab + ac$

$\Rightarrow 3x(x) + 3x(2) - [5x(x) - 5x(3)] + 7$

$\Rightarrow 3x^2 + 6x - [5x^2 - 15x] + 7$

$\Rightarrow 3x^2 + 6x - 5x^2 + 15x + 7$

$\Rightarrow (3x^2 - 5x^2) + (6x + 15x) + 7$

$\Rightarrow -2x^2 + 21x + 7$

The simplified expression matches the value given in Option 4.

Therefore The correct answer is $-2x^2 + 21x + 7$.

Additional Information

Distributive Property

It states that multiplying a sum by a number is the same as multiplying each addend by the number and then adding the products: $a(b + c) = ab + ac$.

Combining Like Terms

Terms with the same variable and exponent can be combined by adding or subtracting their coefficients.

Sign Rules in Multiplication

When multiplying a negative number by another negative number, the result is always positive: $(-a) \times (-b) = +ab$.

Q2. Answer: (b) Article 16

The correct answer is Article 16.

Key Points

• Article 16

• In regard to public employment, equality of opportunity is discussed in Article 16 of our constitution.

• Article 16.1:-

• The term "state" refers to the central or state government, state legislature, parliament, and all authorities and organizations

governed by the Government of India.

• Every citizen of the nation will have equal opportunities whenever the state attempts to offer employment at a position controlled by "The state." Similar to how opportunities are the same for everyone, laws are the same for everyone.

• Article 16.2:-

• The government cannot discriminate against its citizens based on religion, caste, birth, gender, or descent when offering employment in state offices. Furthermore, none of the candidates will be disqualified based on these five criteria.

• Equal employment opportunity is the goal of both articles, but the Indian constitution only allows for the extension of articles 16.1 and 16.2 to offices controlled by "The State."

• This indicates that the state alone is obligated to adhere to article 16, not private organizations or employment with the state on a contract basis.

• Article 16.3:-

• Any employment or appointment in an office controlled by the state can be made subject to a residence requirement set by the parliament. Nobody can stop this.

• India has 22 official languages, so it seems legitimate. Additionally, there are numerous occupations in which workers must interact with locals on a daily basis.

• Article 16.4:-

• Any backward class of citizens can have their reservation granted by the state. who, in the opinion of the state, are not adequately represented in the services provided by the state.

• Simply put, reservations can be granted by the government when recruiting employees for offices under their control. However, reservations can only be granted to members of the lower class and not to members of the upper class and the backward class must not be represented in government positions, and the government must do so.

• Article 16.5:-

• This indicates that the state can provide for the appointment of a person of the same religion to religious institutions.

• The fact that India is home to a large number of different religions lends credence to this provision.

• Additionally, each religion is extremely sensitive to its own tradition.

Additional Information

• Article 14:-

• According to Article 14 of the Indian Constitution, all citizens are treated equally under the law, and it is against the law to discriminate based on gender, caste, religion, place of birth, or post.

• It is also a first fundamental right that talks about equality and demands that laws be made that allow for equal treatment.

• Article 17:-

• It is against the law to practice untouchability in any form. Any disability that is enforced as a result of untouchability is illegal and subject to legal sanctions.

• From the perspective of equality before the law, Article 17 is also a significant provision (Article 14). It ensures human dignity and social justice, two rights that have been denied to a large portion of Indian society for centuries.

• Article 15:-

• Any citizen shall not be subjected to discrimination on the basis of religion, race, caste, sex, place of birth, or any combination thereof.

• Access to shops, public restaurants, hotels, and places of public entertainment shall not be restricted or denied to any citizen solely on the basis of religion, race, caste, sex, place of birth, or any combination thereof; or the utilization of wells, tanks, bathing ghats, roads, and places of the public resort that are either entirely or partially funded by the state and made available to the general public.

Q3. Answer: (d) 2

Shortcut Trick

Mode is defined as the observation that occurs the maximum number of times in a data set.

Count the occurrences of each number:

Number 2 appears 4 times.

Number 6 appears 3 times.

All other numbers appear 2 times or less.

Therefore The correct answer is 2.

Alternate Method

Given Data: 2, 6, 5, 2, 4, 9, 6, 2, 66, 4, 10, 12, 6, 22, 2, 44, 9

Formula: Mode = Value with the highest frequency.

=> Total number of observations (n) = 17

=> Arrange the data in ascending order to check counts: 2, 2, 2, 2, 4, 4, 5, 6, 6, 6, 9, 9, 10, 12, 22, 44, 66

=> Count of 2 = 4

=> Count of 6 = 3

=> Count of 4 = 2

=> Count of 9 = 2

=> Count of other values (5, 10, 12, 22, 44, 66) = 1 each

=> Since the value 2 appears with the maximum frequency (4), it is the mode.

Therefore The correct answer is 2.

Additional Information

Empirical Relationship

For a moderately skewed distribution, the relationship is: Mode = 3 × Median − 2 × Mean.

Mean and Median

Mean is the average of all values, while Median is the central value of the data when arranged in order.

Types of Mode

A data set can be unimodal (one mode), bimodal (two modes), or multimodal (multiple modes).

Q4. Answer: (a) 27

According to the given information:

We can see that the blue region represents the people who are not artists and poets but are only professors = 12 + 15 => 27

Hence, the correct answer is "27".

Q5. Answer: (d) Dhawan- 1

The correct answer is Dhawan-1.

Key Points

• Dhawan-1 is the country's first privately developed completely cryogenic rocket engine.

• It is created by a Hyderabad-based startup in space technology.

• Satish Dhawan, an Indian rocket scientist, is honoured by the name.

• It is created utilising 3D printing technology and runs on liquid oxygen and liquefied natural gas as fuel.

• It is entirely produced in India.

Additional Information

• Homi Bhabha

• He is credited with founding India's nuclear programme.

• Founding director of the Bhabha Atomic Research Centre, formerly known as the Atomic Energy Establishment.

• He received Padma Bhushan and Adam's prizes.

• Dr Vikram Ambalal Sarabhai

• Father of the Indian Space Program.

• Established a Physical Research Laboratory in Ahmedabad.

• Chairman of the Atomic Energy Commission.

• Dr APJ Abdul Kalam

• The Missile Man of India.

• Entitled as the 11th president of India.

• Satish Dhawan

• He was both a mathematician and an aerospace engineer.

• He served as ISRO's third chairman.

• He received numerous honours, including the Padma Vibhushan and the Padma Bhushan.

Q6. Answer: (d) Diagram 1

The correct answer is Diagram 1.

Key Points

• The ureteropelvic junction (UPJ), which is located posterior to the renal vein and artery in the hilum, is where the ureters are first formed.

• The ureters then move inferiorly within the abdominal cavity.

• They enter the bladder on the posterior bladder aspect in the trigone after passing across the psoas muscle.

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Additional Information

• Functions of Bladders:

• The lower abdomen contains this hollow, triangle-shaped organ.

• Ligaments that are connected to various organs and the pelvic bones hold it in place.

• The bladder's walls flatten and constrict to empty pee through the urethra after relaxing and expanding to store urine.

• Functions of ureters:

• Urine is emptied into the bladder every 10 to 15 seconds by the continuously active ureters.

• The kidneys play a number of roles in the body, including balancing fluid levels, releasing hormones to control blood pressure, and regulating the generation of red blood cells.

• Urine travels from the renal pelvis into the bladder through the urinary tract, which is connected to the kidneys by two thin (3 to 4 mm) tubular structures called ureters.

• The peristaltic activity, which is used by the ureter to transport urine from the kidneys to the bladder, is brought on by the muscular layers.

Q7. Answer: (a) distance

The correct answer is Distance.

Key Points

• With increasing distance from the conductor, the magnetic field generated by a given current in the conductor weakens.

• Since the magnetic field weakens with increasing distance from the conductor carrying the current, the concentric circles grow more prominent as we get farther away from it.

• Therefore, the distance from the current-carrying conductor has an inverse relationship with the magnetic field's strength.

• Bringing a stronger magnetic field close to the original magnetic field will cancel out the first field, reducing the original magnetic field.

• In essence, this process—often referred to as magnetic shielding—creates a second magnetic field in the same space that channels a stronger fluctuation.

Additional Information

• An electric charge, an electric current, and magnetic materials are all affected magnetically by a magnetic field, which is a vector field.

• A force perpendicular to the magnetic field and its own velocity acts on a moving charge in a magnetic field.

• B and H stand for the magnetic field. While the SI unit for B is Newtons per meter per ampere or Teslas, the SI unit for H is amperes per meter(A/m).

• Moving electric charges generate magnetic fields.

• Everything is constructed of atoms, and each bit has an orbiting nucleus that is composed of protons and neutrons.

• A weak magnetic field is produced around each atom because the orbiting electrons are tiny moving charges.

Q8. Answer: (b) 1

Given series →

(Left) ¥ 1 λ 2 5 $ 2 # 1 & 2 3 € 1 5 6 % ¥ 2 @ 6 (Right)

Symbols are there, each of which is immediately preceded by a symbol and also immediately followed by a number

Symbol → Symbol → Number

¥ 1 λ 2 5 $ 2 # 1 & 2 3 € 1 5 6 % ¥ 2 @ 6

The above underlined symbol which is immediately preceded by a symbol and also immediately followed by a number.

Hence, the correct answer is "1".

Q9. Answer: (d) South

Given →

P is standing to the south of D, who is to the west of A, who is to the north of J.

After exchanging position of P with A.

South is the direction of J with respect to P.

Hence, the correct answer is "South".

Q10. Answer: (d) Cheraman Juma Mosque

The correct answer is Cheraman Juma Mosque.

Key Points

• In the Indian state of Kerala, there is a mosque called the Cheraman Juma Mosque at Methala, Kodungallur, and Thrissur.

• According to a narrative, it was constructed in 629 CE, making it the earliest convert mosque currently in operation on the Indian subcontinent.

• The successor of Cheraman Perumal, the Chera ruler of contemporary Kerala, gave the order for its construction.

• The mosque's Kerala-style construction and hanging lamps strengthen the historicity of its dating claims.

• The narrative of the Cheraman Perumal Mosque claims that Cheraman Perumal saw the splitting of the moon, a paranormal occurrence recounted in the Quran as a miracle done by Muhammad in response to the Meccans' request for a miracle.

Additional Information

• A mosque in Kilakarai, Tamil Nadu, India is called Palaiya Jumma Palli or Meen kadai Palli. It was constructed between 628 and 630 AD, making it, together with Cheraman Juma Masjid in Kodungallur, Kerala, one of the world's oldest mosques.

• In the Indian state of Uttar Pradesh's Budaun district, Kakrala city is home to the mosque and madrasah (private school) known as Ziarat Shareef. Shah Saqlain Miyan planned and erected the structure.

• The second-oldest mosque in India is called Malik Dinar Mosque, and it is located in Thalangara, a town in Kerala state.

Q11. Answer: (d) Small intestine

The correct answer is Small Intestine.

Key Points

• To improve the surface area for absorption, a villus is present in the small intestine.

• The stomach is a digestive organ that also aids in temporary food storage and protein digestion.

• As a result, the small intestine rather than the stomach is where villi are more appropriately found.

• Villi are projections that resemble fingers and are incredibly densely vascularized.

• By expanding the surface area for absorption, they are found in the inner lining of the small intestine and aid in the absorption of nutrients.

• Additional Information

• Functions and Structure of the Eye:

• The cornea, which is the front of the eye, allows light to reach the lens.

• Light is absorbed by the retinal cells, which subsequently transform it into electrochemical signals that are sent to the brain via the optic nerve.

• The cornea and lens aid in concentrating light rays on the retina of the eye (retina).

• Functions of Kidney:

• eliminate waste from the body.

• detoxify the body of narcotics.

• fluid equilibrium throughout the body

• elicits the release of blood pressure-regulating hormones.

• create a vitamin D active form that helps to maintain robust, healthy bones.

• Red blood cell production can be managed.

• Functions of the Liver:

• The liver filters every drop of blood that leaves the intestines and stomach.

• This blood is processed by the liver, which also breaks down, balances, and produces nutrients.

Q12. Answer: (c) U and T

Given → Six friends P, Q, R, S, T and U sitting around a circular table, facing the Centre.

1) S is seated third to the right of U

2) T is seated to the immediate left of S.

3) Q is the immediate neighbour of U and P.

Therefore, it is established that U and T is immediate neighbour of R.

Hence, the correct answer is "U and T".

Q13. Answer: (b) 6 ohm

The correct answer is 6 ohms.

Key Points

• Resistance

• Electrical resistance, denoted by R, occurs when an electric current passes through a conductor, such as a light bulb. This obstruction is known as electrical resistance.

• Conductors generate heat when current passes through them because every material has electrical resistance.

• The following factors influence a conductor's electrical resistance:

• The cross-sectional area of the conductor

• Length of the conductor

• The material of the conductor

• The temperature of the conducting material

• The series and parallel configurations of resistors are the two most straightforward.

• Resistors in Series: When all of the resistors receive the same amount of current, they are said to be connected in series. The voltage across each resistor in such circuits varies. If any resistor fails or a fault occurs in a series connection, the entire circuit is turned off.

• Resistors in Parallel: When all of the resistors have the same voltage, they are considered to be connected in parallel. When these branches meet at a common point, the current is branched out and recombined in such circuits. In a parallel circuit, it is simple to connect or disconnect a resistor or any other component without affecting other components.

Additional Information

• Calculation

• Three resistors given are,

R1= 12 ohm

R2= 16 ohm

R3= 48 ohm

The formula for total resistance in parallel combination is 1/R_(tot)= 1/R1+ 1/R2+ 1/R3

So, the total resistance

1/R_(tot)= 1/12+ 1/16+ 1/48

1/R_(tot)= 4+ 3+ 1/48

1/R_(tot)= 8/48

1/R_(tot)= 1/6

R_(tot)= 6 ohms

Q14. Answer: (d) 92

The correct answer is 92.

Key Points

• Punjab held legislative assembly elections on February 20, 2022, to choose the 117 members of the province's 16th assembly.

• By winning 92 out of 117 seats, the Aam Aadmi secured a commanding 79% majority in the 16th Punjab Legislative Assembly.

• On March 16, 2022, AAP Punjab convener and MP Bhagwant Mann took the oath of office as chief executive.

• On March 19, 2022, Bhagwant Mann's ministry was established with 10 cabinet members.

Additional Information

• Aam Aadmi Party

• India's Aam Aadmi Party is one of its political parties. In November 2012, Arvind Kejriwal and his former colleagues founded AAP in response to the Indian anti-corruption campaign that began in 2011.

• AAP currently oversees Punjab and Delhi.

• Election symbol for the party is a broom.

• The party was established following a dispute between activist Kejriwal and Indian Anna Hazare about the incorporation of electoral politics into the well-known 2011 anti-corruption movement, which had been demanding a Jan Lokpal Bill since 2011.

Q15. Answer: (d) creating a National Database of Unorganised Workers (NDUW)

The correct answer is creating a National Database of Unorganised Workers (NDUW).

Key Points

• The e-SHRAM portal is inaugurated on 26th August 2021 by Shri Bhupendar Yadav, Hon'ble Minister (L&E) in presence of Shri Rameswar Teli, Hon'ble Minister of states (L&E).

• eSHRAM portal has been developed for creating a national Database of Unorganised Workers, which is seeded with Aadhaar.

• It will have details of the name, Occupation, Address, Educational qualification, Skill types, Family details, etc.

• For the optimum realization of their employability and to extend the benefits of the social security schemes to them.

• Any worker who is working in an unorganized sector and aged between 16-59, is eligible to register on the eSHRAM portal e.g. migrant workers, gig workers, platform workers, agricultural workers, MGNREGA workers, fishermen, Milkmen, ASHA workers, Anganwadi workers, Street vendors, Domestic workers, Rickshaw pullers and other workers engaged in similar other occupations in the Unorganised sectors.

• It is the 1st ever national database of unorganized workers including migrant workers, construction workers, etc.

Q16. Answer: (b) Odisha

The correct answer is Odisha.

Key Points

• The scientific name of the Olive-ridley Turtle is 'Lepidochelys olivacea'.

• Lakhs of endangered Olive Ridley turtles flocked the Rushikulya river mouth for their annual mass nesting in Odisha's Ganjam district.

• These endangered species flock to the place every year from the 3rd week of February to the 1st week of March for nesting.

• Odisha is the largest mass nesting site for Oliver Ridleys in the world, followed by the coasts of Mexico and Costa Rica.

• While last year more than 3.8 lakh turtles flocked the river mouth, the number is expected to rise this year.

• The state government and the Rushikulya Sea Turtle Protection Committee have taken a number of steps to ensure that the turtles are conserved during the period.

• These are the smallest and most abundant of all sea turtles found in the world, inhabiting the warm waters of the Pacific, Atlantic, and Indian oceans.

• These turtles, along with their cousin the Kemps ridley turtle, are best known for their unique mass nesting called Arribada, where thousands of females come together on the same beach to lay eggs. though found in abundance, their numbers have been declining over the past few years, and the species is recognized as vulnerable by the IUCN Red list.

• Growing to about 2 feet in length, and 50 kg in weight, the olive ridley gets its name from its olive-coloured carapace, which is heart-shaped and rounded.

• Males and females grow to the same size; however, females have a slightly more rounded carapace as compared to males.

• They are carnivores and feed mainly on jellyfish, shrimp, snails, crabs, molluscs, and a variety of fish and their eggs. These turtles spend their entire lives in the ocean and migrate thousands of kilometres between feeding and mating grounds in the course of a year.

• Interestingly, females return to the very same beach from where they first hatched, to lay their eggs. During this phenomenal nesting, up to 600,000 and more females emerge from the waters, over a period of 5 to 7 days, to lay eggs.

• They lay their eggs in conical nests about one and a half feet deep which they laboriously dig with their hind flippers.

• After about 45-65 days, the eggs begin to hatch, and these beaches are swamped with crawling Olive-ridley turtle babies, making their 1st trek towards the vast ocean.

Q17. Answer: (b) Both I and II strengthen the statement.

Given:-

Statement:

Eating junk food is not good for health.

Arguments:

I. Junk food has high amount of fats, chemical additives and sodium leading to obesity → Strengthens (This is strong because it explains how eating junk food could be harmful to health)

II. High intake of sugars and fats tend to suppress the function of the brain that helps in learning and memory formation → Strengthens (This is also strong because it explains how high intake of sugars and fats can affect one's brain.)

Hence, the correct answer is "Both I and II strengthen the statement".

Q18. Answer: (a) speed

The correct answer is speed.

Key Points

• Refractive Index

• The ratio of light's speed in a particular medium to its speed in a vacuum.

• The properties of a medium determine how quickly light travels through it.

• The optical density of the medium determines the speed of electromagnetic waves.

• The number n stands for the refractive index, which is calculated by dividing the velocity of light in a medium by the velocity of light in a vacuum. The refractive index has the following formula:

• n= c/v

• Where n is the refractive index, c is the vacuum light speed (3 × 10^8 m/s), and v is the substance light speed.

• The optical density is higher, and the speed of light is slower the higher the refractive index.

Additional Information

• Snell’s Law - Calculation of Angle of Refraction

• This refraction angle is explained by Snell's law. The "Law of Refraction" and "Snell-Descartes" Law are other names for Snell's law. Snell's Law was discovered in 1621 by Willebrord Snell.

• When light travels from one medium to another, such as air, glass, or water, Snell's law explains the relationship between the angle of incidence and the angle of refraction.

• In two distinct media, the phase velocity ratio is the same as the ratio of the sine of the angle of incidence to the sine of the angle of refraction.

• Sinθ2/Sinθ1=v2/v1=n1/n2

• From the normal line perpendicular to the boundary of the surface, each is calculated: v is the light velocity for each medium; n is the refractive index for each medium.

Q19. Answer: (b) 4, 5

Shortcut Trick

Convert the equation to standard form: $x^2 - 9x + 20 = 0$.

Look for two numbers whose Sum is 9 and Product is 20.

Factors of 20 are (1, 20), (2, 10), and (4, 5).

Only the pair (4, 5) satisfies the condition: 4 + 5 = 9 and 4 × 5 = 20.

Therefore The correct answer is 4, 5.

Alternate Method

Given Equation: $x + 20/x = 9$

Method: Factorisation of Quadratic Equation

$\Rightarrow (x^2 + 20) / x = 9$

$\Rightarrow x^2 + 20 = 9x$

$\Rightarrow x^2 - 9x + 20 = 0$

$\Rightarrow x^2 - 5x - 4x + 20 = 0$

$\Rightarrow x(x - 5) - 4(x - 5) = 0$

$\Rightarrow (x - 5)(x - 4) = 0$

$\Rightarrow x - 5 = 0$ or $x - 4 = 0$

$\Rightarrow x = 5$ or $x = 4$

Therefore The correct answer is 4, 5.

Additional Information

Nature of Roots

For a quadratic equation $ax^2 + bx + c = 0$, the Discriminant (D) is $b^2 - 4ac$. If $D > 0$, roots are real and distinct; if $D = 0$, roots are real and equal; if $D < 0$, roots are imaginary.

Sum and Product of Roots

If α and β are the roots, then Sum of roots $(\alpha + \beta) = -b/a$ and Product of roots $(\alpha\beta) = c/a$.

Quadratic Formula

The roots can also be found using $x = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$.

Q20. Answer: (a) 45

The pattern followed here is :

Hence, the correct answer is "45".

Q21. Answer: (c) 2

The pattern followed here is :

Hence, the correct answer is "2".

Q22. Answer: (a) Rs. 750

Shortcut Trick

In Case 1, Ratio of A:B is 1:1.5 → 2:3 (Total 5 parts).

In Case 2, Ratio of A:B is 2:1 (Total 3 parts).

Make total parts equal (LCM of 5 & 3 = 15): Case 1 = 6:9 and Case 2 = 10:5.

Difference in A's share = 10 − 6 = 4 units ≡ 70 − (−130) = Rs. 200.

=> 1 unit = Rs. 50. Total 15 units = 15 × 50 = Rs. 750.

Therefore The correct answer is Rs. 750.

Alternate Method

Let the amount with A be A and B be B.

Given:

Case 1: B + 130 = 1.5 × (A − 130)

Case 2: A + 70 = 2 × (B − 70)

From Case 1:

=> B + 130 = 1.5A − 195

=> 1.5A − B = 325

=> 3A − 2B = 650 — (i)

From Case 2:

=> A + 70 = 2B − 140

=> A − 2B = −210 — (ii)

Subtracting equation (ii) from (i):

=> (3A − 2B) − (A − 2B) = 650 − (−210)

=> 2A = 860

=> A = 430

Substitute A = 430 in (ii):

=> 430 − 2B = −210

=> 2B = 640 => B = 320

=> Total money = A + B = 430 + 320 = 750

Therefore The correct answer is Rs. 750.

Additional Information

Linear Equations in Two Variables

Equations of the form ax + by + c = 0 can be solved using substitution, elimination, or cross-multiplication methods.

Ratio and Sum Property

When money is transferred between individuals, the Total Sum remains constant unless money is added from or removed to an external source.

Unitary Method in Ratios

If the difference between two states of a variable is known in units and absolute value, 1 unit = (Absolute difference) ÷ (Difference in units).

Q23. Answer: (b) Ethane

The correct answer is Ethane.

Key Points

• As many hydrogen atoms as possible are connected to each carbon atom, hence the name "saturated" atoms.

• Alternatively said, hydrogen has saturated the carbon atoms.

• A saturated hydrocarbon is illustrated in the Figure below.

• Each carbon atom in this substance, called ethane, has a triple hydrogen bond.

• Alkanes only have one link between two carbon atoms.

• It is referred to be a saturated hydrocarbon as a result.

Additional Information

• Facts about Acetylene:

• Acetylene, or C2H2, is a crucial hydrocarbon for commerce and is quite reactive.

• Due to the triple bond between the carbon atoms and the resulting high positive free energy of production, it is very reactive.

• The simplest and most well-known member of the hydrocarbon series known as the acetylenic series, or alkynes, which has one or more pairs of carbon atoms joined by triple bonds, is acetylene, also known as ethyne.

• Facts about Benzene:

• At room temperature, benzene is a chemical that is a colorless or light yellow liquid.

• It is quite combustible and has a lovely smell.

• Because of their distinct scents, compounds that resemble benzene are known as aromatic hydrocarbons.

• Any substance with a benzene ring or some benzene-like characteristics is now considered an aromatic chemical.

• Facts about Ethene:

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• The chemical molecule ethylene has the formula C2H4.
• It is a colorless, highly flammable hydrocarbon gas.
• Ethylene is unsaturated due to the presence of a double bond.
• An unsaturated hydrocarbon is ethylene, sometimes known as ethene.

Q24. Answer: (d) 2,750

Shortcut Trick
Let the total quantity be 2 units, so each half is 1 unit.
Total profit required = 2 units × 15% = 30%.
Profit from the first half = 1 unit × 20% = 20%.
Profit needed from the second half = 30% − 20% = 10%.
Cost Price of the remaining half = 5,000 ÷ 2 = Rs. 2,500.
Selling Price of remaining = 2,500 × (100 + 10) ÷ 100 = 2,500 × 1.1 = Rs. 2,750.
Therefore The correct answer is Rs. 2,750.
Alternate Method
Given: Total CP = Rs. 5,000 | Total Profit% = 15% | Profit on first half = 20%.
Formulas: Total SP = CP × (100 + Total P%) ÷ 100 | SP of part = CP of part × (100 + P%) ÷ 100
=> Total SP required = 5,000 × (115 ÷ 100) = Rs. 5,750.
=> CP of the first half = 5,000 ÷ 2 = Rs. 2,500.
=> SP of the first half = 2,500 × (120 ÷ 100) = Rs. 3,000.
=> SP of the remaining half = Total SP − SP of the first half.
=> SP of the remaining half = 5,750 − 3,000 = Rs. 2,750.
Therefore The correct answer is Rs. 2,750.
Additional Information
Weighted Average Method
When parts of a commodity are sold at different profit/loss percentages, the overall profit/loss% is the weighted average: Total P% = (n1p1 + n2p2) ÷ (n1 + n2).
Selling Price Formula
SP = CP × (1 + Profit/100). This formula helps in calculating the individual component values when the net result is known.

Q25. Answer: (c) 122 and 13

Given series : 87 × 122 - 369 - 13 ÷ 2 = 701
After interchanging numbers using the BODMAS rule we get,
1. 369 and 2
87 × 122 - 2 - 13 ÷ 369 = 701
87 × 122 - 2 - 0.03 = 701
10614 - 2 - 0.03 = 701
10611.97 ≠ 701
2. 87 and 2
2 × 122 - 369 - 13 ÷ 87 = 701
2 × 122 - 369 - 0.14 = 701
244 - 369 - 0.14 = 701
-125.14 ≠ 701
3. 122 and 13
87 × 13 - 369 - 122 ÷ 2 = 701
87 × 13 - 369 - 61 = 701
1131 - 369 - 61 = 701
701 = 701
4. 87 and 13
13 × 122 - 369 - 87 ÷ 2 = 701
13 × 122 - 369 - 43.5 = 701
1586 - 369 - 43.5 = 701

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1173.5 ≠ 701

Hence, the correct answer is "122 and 13".

Q26. Answer: (c) 21

In a row of people standing in a waiting area, facing North

• Hari stands seventh from the left end of the row.

• There are three people between hari and the person standing at the exact centre of the row.

21 people are standing in the row.

Hence, the correct answer is "21".

Q27. Answer: (d) In the fallopian tube

The correct answer is In the fallopian tube.

Key Points

• A zygote is created during fertilization when the sperm and egg combine in one of the fallopian tubes.

• The zygote then descends to the fallopian tube, where it develops into a morula.

• The morula develops into a blastocyst once it enters the uterus.

• In the female pelvis, the uterus and ovaries are connected by bilateral fallopian tubes.

• They serve as conduits for the movement of oocytes and fertilization.

• Given their function, the fallopian tubes are both a common cause of infertility and a target for surgical sterilization.

Additional Information

• Location and Functions of Uterus:

• In the female pelvis, between the bladder and the rectum, is the uterus, a hollow muscular structure.

• The fallopian tubes allow the ovaries to create eggs.

• The egg can be fertilized after it has left the ovary and embedded itself in the uterine lining.

• Location and Structure of Cervix:

• The womb's lower end is known as the cervix (uterus).

• It is on the vagina's top.

• It measures from 1 to 1.3 inches (2.5 to 3.5 cm) in length.

• Cervix through which the cervical canal travels.

• It enables the passage of both menstruation blood and fetal blood into the vagina.

• Functions of Vagina:

• The vulva and the uterus' neck are connected by a muscular canal called the vagina (cervix).

• During menstruation, the lining of the uterus is expelled from the vagina, where penetration may happen after intercourse, and where the baby descends during birthing.

Q28. Answer: (d) resistance

The correct answer is resistance.

Key Points

• Ohm is the SI unit for measuring resistance.

• The volt per amp represents the ohm.

• The name was derived from George Ohm, a German physicist.

• Resistance is the degree to which a substance obstructs or opposes an electric current.

• Electron flow is referred to as electric current.

Additional Information

• Facts about Charge:

• The coulomb is a derived SI unit that is used to measure electric charge.

• It is denoted by the letter C.

• One ampere per second of electrical current across a wire is equal to one coulomb of charge.

• Protons and electrons are the two main charge carriers for both positive and negative electric charges.

• Facts about Work:

• The quantity of energy that is transmitted from one form or item to another is referred to as the work.

• Transferring that energy is what it means to work.

• A force must be applied over a distance in order to perform work.

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• Energy transfer into or out of a thing depends on the sign of the work performed on it.

• Facts about Current:

• An electrical charge carrier flow known as current often involves electrons or atoms lacking in electrons.

• The capital letter I frequently used as a symbol for current.

• Amperes are the common unit and are denoted by the letter A.

• Essentially, electric current is the flow or charge of an electric charge that is in motion in a conductor.

• There must be a net flow of charge through the area for it to be present.

• I=timecharge is a formula that expresses the current as the charge flow per second.

• Ampere is the name of the current SI unit.

Q29. Answer: (d) Gram Sabha

The correct answer is Gram Sabha.

Key Points

• The only permanent unit in the Panchayat Raj System is the Gram Sabha.

• Mukhiyas and other Panchayat members serve terms of only five years beginning on the day set aside for the first meeting, although the villagers remain the same.

• A Gram Panchayat is the lowest level of the three-tier Panchayat Institutions, followed by a Panchayat Samiti at the Block level and a Zila Parishad at the District level. A tier is not the Gram Sabha.

Additional Information

• Panchayati Raj

• The Indian subcontinent gave rise to a political system known as the Panchayat Raj, which is mostly employed in India, Pakistan, Bangladesh, Sri Lanka, and Nepal. It is the earliest municipal governance system on the Indian subcontinent, with historical references to it dating back to 250 CE.

• Raj is the term for "rule," and Panchayat is the word for "an assembly" (ayat) of five (panch). In the past, Panchayats were made up of knowledgeable seniors who were selected and welcomed by the neighbourhood.

• These gatherings resolved disagreements between villages and individuals. Yet, these assemblies came in a variety of shapes.

• The president mukhiya, sarpanch, or pradhan, an elected or well-accepted office, were common names for the Panchayat's head.

Q30. Answer: (c) Bauxite

The correct answer is Bauxite.

Key Points

• Bauxite

• Although it is also utilized as an industrial mineral, bauxite is primarily a metallic mineral. It is the only ore utilized in the production of aluminium on a large scale.

• Desilication of clays results in the formation of a large amount of bauxite. In contrast to the mica and chlorite of phyllites, the alumina-rich components of igneous rocks are more easily weathered into clay.

• Aluminum ore is bauxite (Al_2O_3). The bauxite is cleaned up using the Bayer Process. Bauxite ($Al_2O_3.2H_2O$) is the most common aluminium ore.

Additional Information

• Alumina

• A chemical compound primarily composed of oxygen and aluminium molecules is known as alumina or aluminium oxide.

• It is a colourless, crystalline substance that can be found naturally in rubies and sapphires, which are typically made from corundum.

• Additionally, ores like bauxite, which can be found in topsoil in some tropical and subtropical regions, are used to extract alumina.

• Manganese

• Manganese is a chemical element with the atomic number 25 and the symbol Mn.

• This element can be obtained in combination with iron and other minerals, but it is not found in nature as a single element.

• It is a metal that is utilized extensively in stainless steel and other metal alloys.

• Iron

• Iron is a metal, a component of group VIII of the periodic table.

• It has a silver-grey colour and is malleable, ductile, and lustrous. It is the universe's tenth most abundant element.

• It is abundantly present in the molten form at the Earth's core.

Q31. Answer: (b) 4% less

Given:

B(1995 + 1998) = 1620 + 1600

A(1996 + 1997) = 1590 + 1750

Solution:

The total number of coolers sold by shopkeeper B in 1995 and 1998 = 1620 + 1600 = 3220

The total number of coolers sold by shopkeeper A in 1996 and 1997 = 1590 + 1750 = 3340

difference = 3220 - 3340 = -120

=> less

Required percentage = 120/3340 x 100 = 3.5% ~ 4% less

Hence, the correct option is 2.

Q32. Answer: (d) 6

Shortcut Trick

Let Total Capacity of tank = 72 units (LCM of 24 and 18).

Filling pipe efficiency = +3 units/hr | Emptying pipe efficiency = −4 units/hr.

Net efficiency required = 72 units ÷ 1.5 hours = 48 units/hr.

Using Alligation: (Filling 30 × 3 = 90) vs (Emptying 30 × −4 = −120) with mean 48.

Ratio of pipes = (48 − (−120)) : (90 − 48) = 168 : 42 = 4 : 1.

Total parts 4 + 1 = 5 → 30 pipes. 1 part = 6 pipes.

Therefore The correct answer is 6.

Alternate Method

Given: Total pipes = 30, Filling time = 24 hrs, Emptying time = 18 hrs, Net time = 1.5 hrs.

=> Let Filling pipes = x and Emptying pipes = (30 − x).

=> Total work (LCM of 24, 18) = 72 units.

=> Filling efficiency = 72 / 24 = 3; Emptying efficiency = 72 / 18 = 4.

=> Net efficiency = 72 / 1.5 = 48.

=> 3(x) − 4(30 − x) = 48

=> 3x − 120 + 4x = 48 => 7x = 168 => x = 24.

=> Emptying pipes = 30 − 24 = 6.

Therefore The correct answer is 6.

Additional Information

Pipes and Cisterns Efficiency

Filling pipes have positive efficiency while emptying pipes (outlets) have negative efficiency. Total Work = Time × Net Efficiency.

Alligation in Work

Alligation can be used by assuming all pipes are of one type to find the weighted average efficiency and then the ratio of counts.

Unitary Conversion

1.5 hours is equivalent to 3/2 hours. Efficiency = Work / Time = 72 ÷ (3/2) = 48 units/hr.

Q33. Answer: (b) CJRIG

The alphabets and their positions are:

For 'TRAMP' is written as 'VOCJR'

And 'BLANK' is written as 'DICKM'

Similarly for the word 'AMPLE' is coded as:

Thus, the code language for the given the word is CJRIG.

Hence, the correct answer is "CJRIG".

Q34. Answer: (a) Two

The alphabets and their positions are:

According to the given statements, we will get,

Given Word	B	A	C	K	G	R	O	U	N	D

Each letter +1	C	B	D	L	H	S	P	V	O	E

Thus, there is only Two vowel in the group of the letters formed.

Hence, the correct answer is "Two".

Q35. Answer: (b) 314 2/7 cm²

Shortcut Trick

When a sphere is melted into 'n' equal smaller spheres, the new radius becomes r = R ÷ n^(1/3).

Here, n = 8, so the new radius r = 10 ÷ 8^(1/3) = 10 ÷ 2 = 5 cm.

Surface area of each new small ball = 4πr²

=> Surface Area = 4 × (22/7) × 5² = 2200/7 = 314 2/7 cm².

Therefore The correct answer is 314 2/7 cm².

Alternate Method

Given:

Radius of the original solid sphere (R) = 10 cm

Number of identical spherical balls formed (n) = 8

Formula Used:

Volume of a sphere = 4/3 × π × r³

Surface Area of a sphere = 4 × π × r²

R = 10

Original Sphere

Melted into

8 balls

r = ?

8 Equal Balls

Calculations:

Let the radius of each newly formed small spherical ball be r.

Since the large sphere is melted to form 8 identical balls, the total volume remains conserved.

=> Volume of large sphere = 8 × Volume of one small ball

=> 4/3 × π × R³ = 8 × (4/3 × π × r³)

=> R³ = 8 × r³

=> 10³ = 8 × r³

=> 1000 = 8r³

=> r³ = 1000 ÷ 8

=> r³ = 125

=> r = 5 cm

=> Surface Area of each small ball = 4 × π × r²

=> Surface Area = 4 × (22/7) × 5²

=> Surface Area = 4 × (22/7) × 25

=> Surface Area = 100 × (22/7)

=> Surface Area = 2200/7 cm²

=> 2200 ÷ 7 = 314 with a remainder of 2

=> Surface Area = 314 2/7 cm²

Therefore The correct answer is 314 2/7 cm².

Additional Information

Volume Conservation

When a 3D object is melted and recast into other shapes, the total volume always remains constant, even though the combined surface area changes significantly.

Sphere Formulas

Volume of a Sphere = 4/3 × π × r³

Surface Area of a Sphere = 4 × π × r²

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Hemisphere Formulas

Volume of a Hemisphere = $2/3 \times \pi \times r^3$

Curved Surface Area = $2 \times \pi \times r^2$

Total Surface Area = $3 \times \pi \times r^2$

Q36. Answer: (d) UBF : RYC

The alphabets and their positions are:

Given:

RTO : OQL

KMD : HJA

Let's check all the options:

1) ABC : XWZ

2) LOP : IUY

3) JHG : FDS

4) UBF : RYC

Thus, the pair UBF : RYC follows the same logic.

Hence, the correct answer is "UBF : RYC".

Q37. Answer: (d) Loss of electrons

The correct answer is Loss of electrons.

Key Points

• Reduction

• The Latin word for "reduction" means "-to lead back." Therefore, a reduction reaction is anything that returns the metal to its free state. In interactions with a variety of reactants, magnesium undergoes both oxidation and reduction.

• Reduction, according to the Classical or earlier concept, is the process of adding hydrogen or any other electropositive element or removing oxygen or any other electronegative element.

• The electronic concept defines reduction as the acquisition of one or more electrons by an atom or ion.

• Reduction occurs when a reactant accumulates electrons during a reaction.

Additional Information

• Example of the reduction reaction

• Addition of hydrogen:

• $N2 + 3H2 \rightarrow 2NH3$ (reduction of nitrogen)

• Addition of electropositive element:

• $SnCl2 + 2HgCl2 \rightarrow SnCl4 + Hg2Cl2$ (reduction of mercuric chloride)

• Removal of oxygen

• $ZnO + C \rightarrow Zn + CO$ (reduction of zinc oxide)

• Removal of electronegative element

• $2FeCl3 + H2 \rightarrow 2FeCl2 + 2HCl$ (reduction of ferric chloride)

• A substance that causes reduction is known as a reducing agent. Reducing agents are H2, HgCl2, and C in the examples above.

Q38. Answer: (a) Rs. 4,347

Shortcut Trick

Effective Rate for 2 years = $x + y + (xy/100)$

=> Effective Rate = $7 + 7 + (7 \times 7)/100 = 14 + 0.49 = 14.49\%$

=> Compound Interest = 14.49% of Rs. 30,000

=> Compound Interest = $0.1449 \times 30,000$ = Rs. 4,347

Therefore The correct answer is Rs. 4,347.

Alternate Method

Given: Principal (P) = Rs. 30,000, Rate (R) = 7% per annum, Time (n) = 2 years

Formula Used: Amount (A) = $P(1 + R/100)^n$; Compound Interest (CI) = A − P

=> Amount (A) = $30000 \times (1 + 7/100)^2$

=> $A = 30000 \times (107/100) \times (107/100)$

=> $A = 3 \times 107 \times 107$

=> A = 3 × 11449 = Rs. 34,347

=> Compound Interest (CI) = A − P

=> CI = Rs. 34,347 − Rs. 30,000 = Rs. 4,347

Therefore The correct answer is Rs. 4,347.

Additional Information

Successive Percentage Rule

Compound interest follows the law of successive percentage increase. The total interest percentage for 2 years is x + y + (xy/100)%.

CI and SI Difference for 2 Years

The difference between Compound Interest and Simple Interest for 2 years is given by the formula $D = P \times (R/100)^2$.

Annual vs Half-Yearly Compounding

When interest is compounded half-yearly, the nominal annual rate is halved (R/2) and the number of periods is doubled (2n).

Q39. Answer: (b) 1 : 4

The correct answer is 1: 4

Calculation:

Given:

Four equal resistors first connected in series and then connected in parallel

To find:

The ratio of current in series to parallel

Formula:

Resistance in series: Rs=R1+R2+.....+Rn

Resistance in parallel: 1/Rp=1/R1+1/R2+.......+1/Rn

Ohm's law: V=IR

As all the resistors have equal resistance R:

Rs=R+R+R+R=4R

1/Rp=1/R+1/R+1/R+1/R=4/R

Therefore, Rp=R/4

The current in series:

Is=V/Rs=V/4R

The total current in a parallel circuit

Ip=V/Rp=4V/R

The current in a parallel circuit will be divided. The resistors are equal so an equal current will flow in the resistor.

The current in each resistor is I_P/4 = 4Vover 4R = Vover R

The ratio of current in the series circuit to the current in each resistor in the parallel circuit:

Is:I=V/4R:V/R

Is:I=1:4

Q40. Answer: (d) in front of the mirror

The correct answer is in front of the mirror.

Key Points:

• A spherical shell's concave or convex mirrors can be polished from the inside to become convex mirrors.

• The mirror that results from polishing the spherical shell from the inside is a concave mirror.

• A concave mirror will give the impression that light rays parallel to the principal axis are converging on a point in front of the mirror.

• The focal point or focus of the concave mirror is the location at which all of the rays converge.

Additional Information:

• The convex mirror's centre of curvature is located behind the mirror.

• They are collinear points because the pole, focus, and centre of curvature all lie on the same line.

• The centre of curvature is outside the mirror and is not a part of it.

• A single piece of round glass can be cut into concave and convex mirrors by polishing the slices in opposite directions after each cut.

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Q41. Answer: (b) 5

BODMAS rule:

Given: 4 × 5 + 3 ÷ 16 - 1 = ?

According to the given statements we have '+' means '×', '-' means '÷', '×' means '-', and '÷' means '+',

Apply BODMAS rule we will get,

= 4 - 5 × 3 + 16 ÷ 1

= 4 - 5 × 3 + 16

= 4 - 15 + 16

= 4 + 1

= 5

Hence, the correct answer is '5'.

Q42. Answer: (b) 22.6 cm

The correct answer is option 2) 22.6cm

Given:

The refractive index is 1.33 and the height of the tumbler is 30cm

To find:

The apparent depth of the coin we have a formula

Formula:

The refractive index is defined as:

n=(Real depth)/(Apparent depth)

Calculations:

As the refractive index is defined,

n=(real depth)/(apparent depth)

Here, after the substitution of the values we get:

1.33=30/(apparent depth)

Apparent-depth=30/1.33=22.6cm

Thus, the apparent depth of the coin is 22.6cm.

Q43. Answer: (b) 40 %

Shortcut Trick

Use the direct relationship formula: MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%).

MP ÷ CP = (100 + 19) ÷ (100 − 15) = 119 ÷ 85.

Divide both by 17: MP ÷ CP = 7 ÷ 5.

Markup percentage = (7 − 5) ÷ 5 × 100 = 2 ÷ 5 × 100 = 40%.

Therefore The correct answer is 40%.

Alternate Method

Given: Discount = 15%, Profit = 19%.

Formulas: SP = CP × (100 + P%) ÷ 100 | SP = MP × (100 − D%) ÷ 100 | Markup% = (MP − CP) ÷ CP × 100.

=> Let Cost Price (CP) be 100.

=> To gain 19%, Selling Price (SP) = 100 + 19 = 119.

=> This SP is obtained after a 15% discount on Marked Price (MP), so 0.85 × MP = 119.

=> MP = 119 ÷ 0.85 = 140.

=> Markup = MP − CP = 140 − 100 = 40.

=> Markup percentage = (40 ÷ 100) × 100 = 40%.

Therefore The correct answer is 40%.

Additional Information

Marked Price and Discount

Marked Price is the price printed on the product. Discount is always calculated on the Marked Price to arrive at the Selling Price.

Markup Percentage

Markup refers to the amount by which the cost of a product is increased to derive the Marked Price. Markup% = [(MP − CP) ÷ CP] × 100.

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Q44. Answer: (b) 29.92 %

Shortcut Trick

For two successive percentage increases of a% and b%, the effective net increase is calculated using the formula: a + b + (a × b / 100).

Given a = 12% and b = 16%.

Net percentage increase = 12 + 16 + (12 × 16 / 100)

Net percentage increase = 28 + 1.92 = 29.92%

Therefore The correct answer is 29.92%.

Alternate Method

Given:

Increase in First Year = 12%

Increase in Second Year = 16%

Formula Used:

Final Population = Initial Population × (1 + r1/100) × (1 + r2/100)

=> Let the initial population at the beginning of the period be 100.

=> Population after the first year = 100 × (112 / 100) = 112

=> Population after the second year = 112 × (116 / 100)

=> Population at end of 2-year period = 129.92

=> Net increase in population = 129.92 − 100 = 29.92

=> Percentage increase = (29.92 / 100) × 100 = 29.92%

Therefore The correct answer is 29.92%.

Additional Information

Successive Percentage Change Formula

For any two successive changes x% and y%, the effective change is x + y + xy/100. Use a positive sign for increase and a negative sign for decrease.

Effective Rate for n Years

If a value increases at the same rate R% for n years, the effective rate is $[(1 + R/100)^n - 1] \times 100\%$.

Compound Interest Link

Successive percentage increase is the same principle used in Compound Interest calculations where interest is calculated on the updated amount.

Q45. Answer: (b) Nine

The alphabets and their positions are:

According to the given statements, we have:

Thus, there are Nine letters are there in the English alphabetical order between the letters which is third from the left and the one which is second from the right.

Hence, the correct answer is "Nine".

Q46. Answer: (c) Au

The correct answer is Au.

Key Points:

• The likelihood of metals to donate electrons reduces as we down the reactivity scale.

• Therefore, the least reactive metals are at the bottom of the series, and the most reactive metals are at the top.

• Silver comes before gold in the reactive series.

• Silver (Ag) is more reactive than gold (Au).

• The outer electrons of gold have the structure 5d10 6s1.

• Its 5d electrons are thus fully occupied, meaning it lacks readily available d electrons or orbitals for reacting.

Additional Information:

• As we proceed from top to bottom, both reactivity and the metals' reducing nature continue to get stronger.

• This indicates that the strongest reducing agents are the metals at the top of the reactivity series.

• As we travel from the bottom of the series to the top, the electropositive character of the elements likewise gets stronger.

• Metals positioned on the higher side also have a propensity to corrode or tarnish quickly.

• All metals in the series above hydrogen release hydrogen gas when they come into contact with either diluted hydrochloric acid

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or diluted sulfuric acid.

Q47. Answer: (b) Neither conclusion (I) nor (II) follows.

According to the statements, we will get the Venn diagram as:

Let's check all the conclusions as:

(I) Some Rabbits are Bears → Does not follow → There is no relation given between bears and rabbits and also the Venn diagram shows no relation so the conclusion does not follow.

(II) All Teddies are Soft → Does not follow → From the given information only some rabbits are teddies which means only some teddies are soft so the conclusion does not follow.

Thus, neither conclusions I nor II follow.

Hence, the correct answer is Option 2.

Q48. Answer: (b) 2

According to the given word we have:

Thus, only 2 letters are unchanged if arranges in alphabetical order.

Hence, the correct answer is "2".

Q49. Answer: (a) parallelogram

Shortcut Trick

The ratio of angles taken in order is 1 : 3 : 1 : 3.

In any quadrilateral, if the opposite angles are equal (1st = 3rd and 2nd = 4th), then the figure is a parallelogram.

Since the sum of adjacent angles (1 + 3 = 4 parts) is half the total sum (8 parts), they are supplementary (180°), which is a property of parallel lines.

As the angles are not all equal to 90° (ratio 1:3), it is neither a rectangle nor a square.

Therefore The correct answer is parallelogram.

Alternate Method

Given ratio of angles of the quadrilateral = 1 : 3 : 1 : 3

Formula Used: Sum of all internal angles of a quadrilateral = 360°.

Let the measures of the angles be x, 3x, x, and 3x.

=> x + 3x + x + 3x = 360°

=> 8x = 360°

=> x = 360° ÷ 8 = 45°

=> Angle 1 = 45°

=> Angle 2 = 3 × 45° = 135°

=> Angle 3 = 45°

=> Angle 4 = 3 × 45° = 135°

=> Here, Angle 1 = Angle 3 and Angle 2 = Angle 4. Since opposite angles are equal, the quadrilateral is a parallelogram.

=> Since the angles are not 90°, it is not a rectangle or square.

Therefore The correct answer is parallelogram.

Additional Information

Properties of a Parallelogram

Opposite sides are parallel and equal, opposite angles are equal, and consecutive (adjacent) angles are supplementary (sum to 180°).

Angle Sum Property of Polygons

The sum of internal angles of any polygon with n sides is given by the formula (n − 2) × 180°.

Types of Parallelograms

A rectangle is a parallelogram with all angles equal to 90°, and a rhombus is a parallelogram with all sides equal.

Q50. Answer: (a) 23

Given:

In total visitors in parks A and C, 50% are females

Formula used:

Total number = Total value x percentage

Calculation:

According to the graph

=> Visitors in park A = 29

=> Visitors in park C = 17

=>Total visitors in parks A and B = 29 + 17 = 46

=> Number of females = 46 x 50/100 = 23

=> Number of males = Total visitors - Numbers of females = 46 - 23 = 23 males

=> Hence, The numbers of males in parks A and C are 23 males

Q51. Answer: (a) KPTKTMTTT

Given: _ _LMT_ _PLMT_KPL_ _ _KPLMT_

Let's check all the options as:

1) KPTKTMTTT: KPLMTT - KPLMTT - KPLMTT - KPLMTT

• Here, KPLMTT is repeating

2) LPTKTMTTT: LPLMTT - KPLMTT - KPLMTT - KPLMTT

3) KLTKTMTTT: KLLMTT - KPLMTT - KPLMTT - KPLMTT

4) KPTKTMTTM: KPLMTT - KPLMTT - KPLMTT - KPLMTM

Thus, the missing blanks will be KPTKTMTTT.

Hence, the correct answer is 'option 1'.

Q52. Answer: (b) methanol

The correct answer is methanol.

Key Points:

• A homologous series is a collection of substances that have a common generic formula and have related chemical characteristics.

• As the atomic mass of the series' members increases, so do their physical characteristics.

• The alcohols are a group of related organic substances.

• They all contain the functional group -OH, which is in charge of giving alcohols their unique characteristics.

• In the homologous sequence, the first three alcohols are methanol (CH3OH), ethanol (C2H5OH), and propanol (C3H7OH).

• Methanol is the previous homolog of ethanol.

Additional Information:

• When diluted, ethanol can be found in beer, wine, and spirits.

• It is a topically applied component that helps to prevent skin infections in cosmetics, perfumes, and pharmaceutical preparations such rubbing compounds, lotions, tonics, and colognes.

• The ethanol used in industry as a solvent for fats, oils, waxes, resins, and hydrocarbons may be present in fuels that are designated as ethanol-blended fuels.

• It is used to make a variety of chemicals, including lacquers, plastics and plasticizers, rubber and rubber accelerators, aerosols, mouthwash products, soaps, and cleaning solutions.

Q53. Answer: (b) Ministry of Defence

The correct answer is Ministry of Defence.

Key Points

• Ministry of Defence

• The defence of India and all of its parts is the responsibility of the Indian government. The President holds the Armed Forces Supreme Command. The Cabinet is in charge of ensuring the nation's defence.

• This is carried out by the Ministry of Defence, which gives the Armed Forces the policy framework and tools they need to carry out their duties as part of the country's defence. The Ministry of Defence is headed by the Raksha Mantri or Defense Minister.

• The Defense Ministry's primary responsibility is to obtain policy directives from the government on all matters pertaining to defence and security and to communicate them to the Services Headquarters, Inter-Services Organizations, Production Establishments, and Research and Development Organizations for implementation.

Additional Information

• Ministry of AYUSH

• On November 9, 2014, the Ministry of Ayush was established with the intention of bringing back the profound knowledge of our ancient medical systems and ensuring the best possible growth and spread of the Ayush medical systems.

• In the past, these systems were developed by the Department of Indian System of Medicine and Homoeopathy (ISM&H), which

was established in 1995.

• In November 2003, it was renamed the Department of Ayurveda, Yoga, and Naturopathy, Unani, Siddha, and Homoeopathy (Ayush), with a focus on Ayurveda, Yoga, and Naturopathy, Unani, Siddha, and Homoeopathy education and research.

• Ministry of Home Affairs

• A ministry of the Indian government is known as the Ministry of Home Affairs, or simply the Home Ministry. It is primarily accountable for maintaining domestic policy and internal security as India's interior ministry.

• Amit Shah, Union Minister of Home Affairs, is in charge of the Home Ministry.

• The cadre controlling authority for the Indian Police Service (IPS), DANIPS, and DANICS is also the Home Ministry. The ministry's Police-I Division is in charge of cadre control for the Indian Police Service; DANIPS' administrative division, on the other hand, is the UT Division.

• Ministry of Women and Child Development

• With effect from January 30, 2006, the Department of Women and Child Development of the Government of India became a separate Ministry. Prior to that, it had been a Department within the Ministry of Human Resources Development since 1985.

• The primary objective of the Ministry was to fill in the gaps in state action for women and children by encouraging interministerial and sectoral convergence in the development of gender-equitable and child-centred legislation, policies, and programs.

Q54. Answer: (a) Savitribai Phule

The correct answer is Savitribai Phule.

Key Points

• Savitribai Phule

• Savitribai Phule was a poet, educationalist, and social reformer from Maharashtra, India.

• In Maharashtra, along with her husband, Mahatma Jyotiba Phule, she contributed significantly to the advancement of women's rights in India.

• She is thought to have started the feminist movement in India. In 1848, Savitribai and her husband established Bhide wada, one of the first modern Indian girls' schools, in Pune.

• In 1818, Robert May of the London Missionary Society was the first to establish a school solely for girls in the Chinsurah region of Bengal. She worked to eliminate caste and gender-based discrimination and unfair treatment.

Additional Information

• Ramabai Ranade

• Indian social worker Ramabai Ranade was born on 25 January 1862 and died on 25 January 1924. She was one of the first advocates for women's rights in the early 20th century.

• Annie Besant

• Annie Besant was a British socialist, theosophist, freemason, activist for women's rights and Home Rule, educator, and advocate for Indian nationalism. She was born on October 1, 1847, and died on September 20, 1933.

Q55. Answer: (d) TFM

The alphabets and their positions are:

For 'PEN' is written as 'KVM'

And 'CAN' is written as 'XZM'

Similarly for the word 'GUN' is coded as:

Thus, the code language for the given word is TFM.

Hence, the correct answer is "TFM".

Q56. Answer: (d) CFCs

The correct answer is CFCs

Key Points

• CFCs

• Chemicals with carbon, chlorine, and fluorine atoms are known as chlorofluorocarbons (CFCs), and they are neither poisonous nor combustible.

• They are employed as solvents, refrigerants, blowing agents for foams and packaging materials, and in the production of aerosol sprays.

• CFCs slowly ascend into the stratosphere, are oxidized by strong UV light, release chlorine atoms, and then interact with ozone molecules, they can weaken the ozone layer.

Additional Information

• NO2

• The lung's ability to fight against germs may be reduced by nitrogen dioxide, rendering them more vulnerable to infections.
• One of the extremely reactive gases known as nitrogen oxides or oxides of nitrogen is nitrogen dioxide (NO2) (NOx).
• Nitrogen dioxide is a toxic gas that is heavier than air and has a smell similar to bleach and a color similar to yellow or yellow-brown.
• SO2
• _Sulfur dioxide, sometimes known as sulfide, is a chemical having the formula SO 2.
• Sulfur dioxide is a serious irritant to the skin, mucous membranes, eyes, and respiratory system.
• It is a poisonous gas that causes a burnt match odor.
• CO
• The chemical symbol for colorless carbon monoxide is CO.
• Carbonic oxide and carbon oxide are other names for them.
• It is a poisonous gas.
• It has no flavor and no smell

Q57. Answer: (c) Rs. 5,000

Shortcut Trick
Remaining salary percentage = 100% − 30% = 70%
Given, 70% of Salary = Rs. 3,500
100% of Salary = (3500 ÷ 70) × 100 = Rs. 5,000
Therefore The correct answer is Rs. 5,000.
Alternate Method
Given:
Expenditure on Groceries = 30%
Remaining Amount = Rs. 3,500
Let the total salary be S.
=> Savings % = 100% − 30% = 70%
=> 70% of S = 3,500
=> (70/100) × S = 3,500
=> S = (3,500 × 100) ÷ 70
=> S = 50 × 100
=> S = 5,000
Therefore The correct answer is Rs. 5,000.
Additional Information
Percentage Change Base
When a value decreases by x%, the remaining value is (100 − x)% of the original base.
Successive Percentage
If spending is done on the 'remaining' amount multiple times, use the multiplying factor method: Final = Initial × (1−r1) × (1−r2).
Conversion Rule
To find the total (100%) from a partial value, use: Total = (Value ÷ Percentage) × 100.

Q58. Answer: (c) 110

The Logic followed here is:-
[First term × (First term - 1)] = Second term
In 7 : 42
In 5 : 20
Similarly, In 11 : 110
Thus, it can be clearly seen that 110 is related to 11.
Hence, the correct answer is "110".

Q59. Answer: (a) 40

Given → 25 × 5 ÷ 7 - 10 × 2
New equation after replacing signs with their meaning signs is:-
25 ÷ 5 + 7 × 10 ÷ 2

Now, by solving the new equation using BODMAS Rule we get:-

= 25 ÷ 5 + 7 × 10 ÷ 2

= 5 + 7 × 5

= 5 + 35

= 40

As can be seen that after solving the equation using BODMAS Rule we get 40

Hence, the correct answer is "40".

Q60. Answer: (b) 7

Given → A certain number of people are sitting in a straight line facing north.

1)Only three people are sitting between D and I. No one is sitting to the left of D.

2) I is sitting to the immediate left of O.

3) Only one person is sitting to the right of O.

3) There are only two people sitting between K and O.

As can be seen, there are 7 people sitting in a straight line facing north.

Hence, the correct answer is "7".

Q61. Answer: (c) Neither conclusion (I) nor (II) follows.

The least possible Venn diagram for the given statements is:-

Conclusions:

(I) Some Butters are Ice-creams → Doesn't follow (As no direct relationship is given between butter and ice-creams so, it is not definite that some butters are ice-creams.)

(II) All Eggs are Ice-creams → Doesn't follow (It is possible but not definite)

Hence, the correct answer is "Neither conclusion (I) nor (II) follows".

Q62. Answer: (a) mechanical

The correct answer is Mechanical.

Key Points

• Mechanical energy

• The energy of a moving item or the energy that an object stores due to its location.

• Mechanical energy is the total kinetic and potential energy.

• In order to efficiently create electricity or convert energy, many sources of renewable energy depend on mechanical energy.

Additional Information

• Light

• Electromagnetic radiation that can be seen by the human eye is known as light, or visible light.

• Photons are bundles of the electromagnetic field that contain a set amount of energy and are the building blocks of light.

• Kinetic energy includes light energy.

• Heat

• Heat is produced when kinetic energy moves within a material or an object, or when kinetic energy moves from an energy source to a material or an object.

• Such energy may be transported through three different mechanisms: radiation, conduction, and convection.

• An object's heat is made up of all of the energy of all internal molecular motion.

• Magnetic

• The ability to cause attracted and repelling events in other things is referred to as magnetism, which is a category of physical characteristics that are mediated by a magnetic field.

• Magnetism is created by moving electric charges.

Q63. Answer: (a) 10°

Shortcut Trick

For any triangle ABC, if AD is the angle bisector of angle BAC and AE is the altitude perpendicular to BC, then the angle between the bisector and the altitude is given by the direct formula:

angle DAE = 1/2 × |angle B − angle C|

Given: angle B = 30° and angle C = 50°

=> angle DAE = 1/2 × |30° − 50°|

=> angle DAE = 1/2 × 20° = 10°

Therefore The correct answer is 10°.

Alternate Method

Given:

=> In ΔABC, angle B = 30° and angle C = 50°

=> AE is perpendicular to BC (AE perpendicular to BC)

=> AD is the angle bisector of angle BAC

Formula Used:

=> Angle Sum Property of a triangle: Sum of all interior angles of a triangle is 180°.

=> An angle bisector divides an angle into two equal halves.

Calculations:

In ΔABC, using the angle sum property:

=> angle BAC + angle B + angle C = 180°

=> angle BAC + 30° + 50° = 180°

=> angle BAC + 80° = 180°

=> angle BAC = 180° − 80° = 100°

Since AD is the angle bisector of angle BAC:

=> angle BAD = angle CAD = angle BAC ÷ 2

=> angle CAD = 100° ÷ 2 = 50°

In right-angled ΔAEC (since AE perpendicular to BC, angle AEC = 90°):

=> angle CAE + angle AEC + angle C = 180°

=> angle CAE + 90° + 50° = 180°

=> angle CAE + 140° = 180°

=> angle CAE = 180° − 140° = 40°

From the figure, we can express angle CAD as:

=> angle CAD = angle CAE + angle DAE

=> 50° = 40° + angle DAE

=> angle DAE = 50° − 40° = 10°

Therefore The correct answer is 10°.

Additional Information

Angle Between Altitude and Angle Bisector

In any triangle, the angle formed between the altitude and the internal angle bisector drawn from the same vertex is always equal to half the positive difference of the other two angles of the triangle.

Angle Bisector Theorem

An angle bisector in a triangle divides the opposite side into two segments that are proportional to the other two sides of the triangle: BD ÷ DC = AB ÷ AC.

Right-Angled Triangle Properties

In a right-angled triangle, the two acute angles are complementary, meaning their sum is always exactly 90°.

Q64. Answer: (d) A > E

Given → E ≤ D < K = A > P > Z

Now, checking options one by one:-

Option 1) P > D → False (According to the statement, D < K = A > P therefore, no relationship can be established between P and D)

Option 2) Z = E → False (As given in the statement, E ≤ D < K = A > P > Z therefore, no relationship can be established between Z and E)

Option 3) A ≥ Z → False (As given in the statement, A > P > Z therefore, A > Z)

Option 4) A > E → True (According to the statement, E ≤ D < K = A therefore, E < A)

From the options above it is clear that only A > E is true.

Hence, the correct answer is "A > E".

Q65. Answer: (d) Dinesh

Given → Six teachers are sitting around a circular table facing the centre.

1)Ruhi is sitting second to the left of Sophie.

2) Preeti is an immediate neighbour of both Sophie and Gautam.

3) Mary is sitting to the immediate left of Ruhi.

4) Gautam is sitting third to the right of Dinesh.

Therefore,it is established that Dinesh is an immediate neighbour of both Ruhi and Sophie.

Hence, the correct answer is "Dinesh".

Q66. Answer: (b) down the group with increasing atomic masses

The correct answer is down the group with increasing atomic masses.

Key Points

• Dobereiner's triads

• German physicist Johann Wolfgang Dobereiner identified clusters of elements with linked properties and gave them the name Dobereiner's triads.

• He observed that triads, which are collections of three elements with a common set of physical and chemical properties, may form.

Additional Information

• Atomic mass

• the amount of material that makes up an element's atom.

• The size of an atom is indicated by its atomic mass.

• The carbon-12 atom, which possesses six neutrons, has an atomic mass of 12 AMU.

• Elements

• The primary constituent of a whole refers to a simple substance that cannot be broken down into smaller parts or changed into another chemical.

The basic building block of an element is an atom, which consists of protons, neutrons, and electrons.

• An element's atoms all contain the same number of protons.

Q67. Answer: (a) Leaves and shoots

The correct answer is Leaves and Shoots.

Key Points

• Shoot

• The portion of a plant that grows above ground and contains blooming buds, lateral buds, and flowering stems is called a shoot.

• Functions. It is in charge of a plant's ability to produce food or engage in photosynthesis.

• Leave

• A leaf is a major stem appendage of a vascular plant that is designed specifically for photosynthesis and is often carried laterally aboveground.

• Leaves are collectively referred to as "flora," as in "fall foliage," whereas the shoot system consists of the leaves, stem, flower, and fruit.

Additional Information

• Roots

• All vascular plants have substantial subterranean components called roots.

• This area of the plant is primarily in charge of securing it to the ground and using the soil's vital nutrients, minerals, and water.

• Food is kept in it as well.

• Flowers

• A flower is a flowering plant's reproductive organ, sometimes referred to as a bloom or blooming (plants of the division Angiospermae).

• In terms of biology, a flower's role in reproduction is to facilitate the union of sperm and eggs.

Q68. Answer: (d) 27 years

Shortcut Trick

Ratio of present ages (P : Q) = 5 : 4. Sum of ratios = 5 + 4 = 9 units.

The total age must be a multiple of 9.

Ratio 9 years ago: P − 9 = 2(Q − 9). Using units: (5x − 9) = 2(4x − 9).

5x − 9 = 8x − 18 => 3x = 9 => x = 3.

Sum of present ages = 9 × 3 = 27 years.

Therefore The correct answer is 27 years.

Alternate Method

Given: Ratio of present ages of P and Q = 5 : 4. Time gap = 9 years.

Let present age of P = 5x and Q = 4x.

=> Age of P nine years ago = 5x − 9

=> Age of Q nine years ago = 4x − 9

=> According to question: (5x − 9) = 2 × (4x − 9)

=> 5x − 9 = 8x − 18

=> 18 − 9 = 8x − 5x

=> 9 = 3x => x = 3

=> Sum of present ages = 5x + 4x = 9x

=> 9 × 3 = 27 years.

Therefore The correct answer is 27 years.

Additional Information

Age Ratio Concept

The difference between ages of two people remains constant regardless of the number of years passed.

Sum of Ages Formula

If the ratio is a:b, then Total Sum = (a + b) × k, where k is the common constant of proportionality.

Future/Past Age Calculation

Age after 'n' years = Present age + n; Age 'n' years ago = Present age − n.

Q69. Answer: (c) 100%

The correct answer is 100%.

Key Points

• FDI (Foreign Direct Investment)

• Foreign Direct Investment refers to any investment made into a nation by a person or company based in another nation.

• In most cases, FDI occurs when a foreign company establishes businesses in a country or acquires ownership or a controlling stake in its shares.

• It is not the same as foreign portfolio investment, in which a foreign company simply purchases equity shares.

• In FDI, the foreign company controls the company's day-to-day operations.

• In addition to money, technology, knowledge, skills, and expertise/knowledge are all part of FDI.

Additional Information

• FDI Routes in India

• 100% FDI permitted through Automatic Route

• The foreign entity does not need the government or RBI's prior approval when going the automatic route.

• Example:

• Medical devices: up to 100%

• Thermal power: up to 100%

• Services under Civil Aviation Services such as Maintenance & Repair Organizations

• Insurance: up to 49%

• Up to 100% FDI permitted through Government Route

• Under the government option, the foreign entity should require the government's approval.

• Example:

• Broadcasting Content Services: 49%

• Banking & Public sector: 20%

• Food Products Retail Trading: 100%

• Core Investment Company: 100%

• Multi-Brand Retail Trading: 51%

• Sectors where FDI is prohibited

• Agricultural or Plantation Activities (although there are many exceptions like horticulture, fisheries, tea plantations, Pisciculture,

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animal husbandry, etc.)

• Atomic Energy Generation

• Nidhi Company

• Lotteries (online, private, government, etc.)

• Investment in Chit Funds

• Trading in TDR's

• Any Gambling or Betting businesses

• Cigars, Cigarettes, or any related tobacco industry

• Housing and Real Estate (except townships, commercial projects, etc.)

Q70. Answer: (c) baking powder

The correct answer is baking powder.

Key Points

• Baking powder

• Baking powder is a dry chemical leavening ingredient that is created by mixing a carbonate or bicarbonate with a weak acid.

• The base and acid don't interact too rapidly when a buffer, such as cornflour, is present.

• Baking powder is used to increase the volume and texture of baked goods.

Additional Information

• Bleaching powder

• It is employed in the textile sector as a bleaching agent for cotton and linen as well as for the laundry's usage in bleaching soiled clothing.

• Due to its potent oxidizing properties, it is employed as an oxidizer in several industries.

• It is employed as a disinfectant to purify water so that it may be consumed.

• Washing soda

• By tying to the minerals in the water, washing soda "softens" the water, enabling the detergents to extract dirt from the cloth.

• Also useful for removing grease from pots and pans and coffee and tea stains from ceramics are washing soda.

• Baking soda

• A versatile component with several use outside of cooking, baking soda.

• This common home item excels in cleaning and deodorizing because it can get rid of stubborn stains, and bad odors, and clean hard-to-reach places like the oven, microwave, and tile grout.

Q71. Answer: (a) Ministry of Minority of Affairs

The correct answer is Ministry of Minority of Affairs.

Key Points

• Ministry of Minority of Affairs

• The Indian government's Ministry of Minority Affairs was established on January 29, 2006, after the Ministry of Social Justice and Empowerment was split up.

• It is the highest body for the regulatory and development programs run by the central government in India for minority religious and linguistic communities.

• These communities include Muslims, Sikhs, Christians, Buddhists, Zoroastrians (Parsis), and Jains, all of whom were listed as minority religious communities in The Gazette of India in accordance with Section 2(c) of the National Commission for Minorities Act, 1992.

• On September 4, 2017, Mukhtar Abbas Naqvi became the cabinet minister for Minority Affairs. When Najma Heptulla was the cabinet minister, he was the Minister of State for Minority Affairs.

Additional Information

• Ministry of Finance

• The Indian government's Ministry of Finance is responsible for the country's economy and serves as the country's Treasury.

• Taxation, financial regulations, financial institutions, capital markets, central and state finances, and the Union Budget are just a few of the topics it addresses.

• The Indian Revenue Service, the Indian Audit and Accounts Service, the Indian Economic Service, and the Indian Civil Accounts Service are the four central civil services that are overseen by the Ministry of Finance.

• Ministry of Home Affairs

• A ministry of the Indian government is known as the Ministry of Home Affairs, or simply the Home Ministry.

• It is primarily accountable for maintaining domestic policy and internal security as India's interior ministry. Amit Shah, Union

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Minister of Home Affairs, is in charge of the Home Ministry.

• The cadre controlling authority for the Indian Police Service (IPS), DANIPS, and DANICS is also the Home Ministry.

• The ministry's Police-I Division is in charge of cadre control for the Indian Police Service; DANIPS' administrative division, on the other hand, is the UT Division.

• Ministry of Skill Development and Entrepreneurship

• India's Ministry of Skill Development and Entrepreneurship was established on November 9, 2014, to oversee the nation's entire skill development program.

• On April 16, 2015, the Ministry of Labour and Employment handed over responsibility for industrial training, apprenticeships, and other skill development activities to this newly formed ministry.

• It aims to close the gap between the demand for skilled workers and the supply, developing new skills and creative thinking for both existing jobs and future ones.

Q72. Answer: (d) Punjab National Bank

The correct answer is "Punjab National Bank".

Key Points

• By combining with anchor bank PNB on April 1, 2020, Oriental Bank of Commerce and United Bank of India would possess a combined value of Rs. 7.95 trillion, establishing it as India's second-largest bank.

• PM Narendra Modi declared a massive merger of India's ten public sector undertaking (PSU) banks into four in August 2019.

• The cabinet's acceptance of the proposal was communicated the next year by Minister Nirmala Sitharaman. The mergers were scheduled to go into effect on April 1st, 2020.

• When two or more banks combine their resources to operate under a single charter, they are said to have merged. Usually, the name of the bank will be carried over by the combined firm.

• Therefore, the correct answer is: Punjab National Bank

Additional Information

• After merging with Syndicate Bank, Canara Bank had a combined market value of Rs. 15.2 trillion, making it India's fourth-largest bank.

• Union Bank of India has merged with Andhra Bank, Corporation Bank, and other banks. The anchor bank would rank fifth among India's state-run banks after the merger, with an estimated value of Rs. 14.59 trillion.

• With a combined value of Rs. 8.08 trillion, Indian Bank would be the seventh-largest PSB following the merger with Allahabad Bank.

• Vijaya Bank and Dena Bank were combined with the Bank of Baroda. The merger became official on April 1, 2019.

• 2017 saw a merger between the State Bank of India and Bharatiya Mahila Bank, SBI's associate banks.

Q73. Answer: (a) J < Z

Given Statement: Z > Q > L = J < R < P

Checking the options given, we get

1) J < Z → True (As per the given statement Z > Q > L = J < R < P which implies that Z > J and thus J < Z)

2) Q < P → Not True (As per the given statement Z > Q > L = J < R < P, we did not find any definite relation between Q and P, thus Q < P can not be concluded.)

3) R > Z → Not True (As per the given statement, Z > Q > L = J < R < P, no definite relation can be established between R and Z, thus the conclusion R > Z can not be made).

4) P < L → Not True (As per the given statement, Z > Q > L = J < R < P, there is a definite relation between P and L, i.e. P > L, which contradicts the conclusion and thus it is not true.

Thus, only the conclusion J < Z is true.

Hence, the correct answer is 'J < Z'.

Q74. Answer: (a) 1887

Shortcut Trick

Apply the Osculator method for 17: Multiply the last digit by 5 and subtract from the remaining number.

For 1887: 188 − (7 × 5) = 188 − 35 = 153.

Repeat: 15 − (3 × 5) = 15 − 15 = 0.

Since the result is 0, the number is divisible by 17.

Therefore The correct answer is 1887.

Alternate Method

Given: Numbers 1887, 2989, 991, 2022. Divisor = 17.

Check each option using long division or splitting:

=> Option 1: 1887 ÷ 17

=> 1887 = 1700 + 170 + 17

=> 1887 = (17 × 100) + (17 × 10) + (17 × 1)

=> 1887 = 17 × (100 + 10 + 1) = 17 × 111

=> Remainder = 0. (Divisible)

=> Option 2: 2989 ÷ 17 => 2989 = 1700 + 1289 => 1289 ÷ 17 => Remainder = 14. (Not divisible)

=> Option 3: 991 ÷ 17 => 17 × 50 = 850; 991 − 850 = 141 => 17 × 8 = 136; Remainder = 5. (Not divisible)

=> Option 4: 2022 ÷ 17 => 2022 = 1700 + 322 => 322 ÷ 17 => 17 × 10 = 170; 152 ÷ 17 => Remainder = 16. (Not divisible)

Therefore The correct answer is 1887.

Additional Information

Divisibility Rule for 13

Multiply the last digit by 4 and add to the remaining number. If the result is divisible by 13, the number is divisible.

Divisibility Rule for 19

Multiply the last digit by 2 and add to the remaining number. If the sum is a multiple of 19, the original number is divisible.

Divisibility Rule for 7

Subtract twice the last digit from the rest of the number. If the result is 0 or divisible by 7, the number is divisible.

Q75. Answer: (c) (b) and (d) are only correct

The correct answer is "(b) and (c) are only correct".

Key Points

• A mirror with a curved surface is called a spherical mirror.

• The spherical mirrors are painted on one side.

• Spherical mirrors are of two types: Concave mirrors and convex mirrors.

• In concave mirrors, the outward surface is painted and the inner surface is the reflecting surface.

• When the concave mirror is placed close to the object - a magnified, erect, and virtual image is formed.

• When an object is placed at some distance - the size of the image reduces, and the real and inverted image is formed.

• So, the image formed by concave mirrors can be small or large and real or virtual depending on the position of the object.

Additional Information

• Convex mirror:

• When the inner surface of the mirror is painted it is called as a convex mirror.

• Virtual, erect, and diminished images are always formed in the convex mirrors. The image formation does not depend on the distance between the image and the image.

• Plane mirror:

• It has a flat, smooth, and reflective surface.

• The image formed by this mirror is always of the same size and shape as that of the object.

• It always forms a virtual image that is upright.

Q76. Answer: (b) 6.75

Shortcut Trick

Apply Inverse Proportion: P1 × T1 = P2 × T2

15 × 9 = 20 × T2

T2 = 135 ÷ 20 = 6.75 minutes

Therefore The correct answer is 6.75 minutes.

Alternate Method

Given:

Initial number of pipes (P1) = 15

Initial time taken (T1) = 9 minutes

Final number of pipes (P2) = 20

Formula Used:

Total Work = Number of Pipes × Time taken

Calculations:

=> Total capacity of tank = 15 × 9 = 135 units

=> Time taken by 20 pipes = Total capacity ÷ Number of pipes

=> Time = 135 ÷ 20

=> Time = 6.75 minutes

Therefore The correct answer is 6.75 minutes.

Additional Information

Inverse Proportion

When the number of pipes increases, the time taken to fill the tank decreases. This is a case of inverse variation (x × y = k).

Chain Rule

The general formula is (M1 × D1 × H1) ÷ W1 = (M2 × D2 × H2) ÷ W2, where W is the work done.

Q77. Answer: (b) 2004

The correct answer is "2004".

Key Points

• Tamil was designated as India's Classical Language by the Indian government in 2004.

• Tamil was recognized as an Indian classical language in 2004 after meeting three requirements: having ancient beginnings, having a distinct heritage, and having a sizable amount of classical literature.

• Over 66 million people spoke Tamil at the beginning of the twenty-first century.

• Both the union territory of Puducherry and the Indian state of Tamil Nadu have it as their official language.

• Therefore, the correct answer is: 2004

Additional Information

• The government designated Sanskrit as an Indian Classical Language in 2005, immediately after Tamil. There is no denying that many languages from the Dravidian and Indo-European language families have their roots in these two languages.

• Kannada and Telugu were given the status of classical languages by the government in 2008.

• 2013 saw the designation of Malayalam as a classical language, and 2014 saw the addition of Odia to the list.

Q78. Answer: (a) x = 15, y = 3

Calculation:

Here, we have

x/9 = 105/63 = 5/y

=> x/9 = 105/63

=> x = 105/7 = 15

Also, 105/63 = 5/y

=> 21/63 =1/y

=> y = 63/21 = 3

Hence, the value of x is 15 and that of y is 3.

Q79. Answer: (b) 2

Shortcut Trick

Put θ = 45° because the expression is independent of θ.

$\cos^2 45° = 1/2$, $\sin^2 45° = 1/2$, and $\cot^2 45° = 1$.

Expression = $\sqrt{[(4 - 5\times(1/2))/(1/2) + 1]} = \sqrt{[(4 - 2.5)/0.5 + 1]}$.

=> $\sqrt{[1.5/0.5 + 1]} = \sqrt{[3 + 1]} = \sqrt{4} = 2$.

Therefore The correct answer is 2.

Alternate Method

Given: $\sqrt{[(4 - 5\cos^2\theta)/\sin^2\theta + \cot^2\theta]}$

Formula Used: $\cot^2\theta = \cos^2\theta / \sin^2\theta$ and $\sin^2\theta + \cos^2\theta = 1$

=> $\sqrt{[(4 - 5\cos^2\theta + \cos^2\theta) / \sin^2\theta]}$

=> $\sqrt{[(4 - 4\cos^2\theta) / \sin^2\theta]}$

=> $\sqrt{[4(1 - \cos^2\theta) / \sin^2\theta]}$

=> $\sqrt{[4\sin^2\theta / \sin^2\theta]} = \sqrt{4}$

=> 2

Therefore The correct answer is 2.

Additional Information

Trigonometric Identities

Fundamental identities: $\sin^2\theta + \cos^2\theta = 1$, $1 + \tan^2\theta = \sec^2\theta$, and $1 + \cot^2\theta = \operatorname{cosec}^2\theta$.

Value Substitution Method

For expressions with multiple trigonometric ratios, substituting standard angles like 30°, 45°, or 60° often simplifies calculation quickly.

Q80. Answer: (a) The pressure is much greater in veins than in arteries.

The correct answer is "The pressure is much greater in veins than in arteries".

Key Points

• The false statement is - The pressure is much greater in veins than in arteries.

• The correct statement is - The pressure is much greater in arteries than in veins.

• Arteries carry the blood away from the heart and the veins carry the blood to the veins.

• Arteries:

• Have thick walls.

• Thick muscle layers.

• Elastic fibers.

• Veins:

• Thin walls.

• Thin layers of muscle.

• Elastic fibers.

• So, the veins carry blood back to the heart so the pressure of blood returning is low and the walls of veins are thin.

Additional Information

• Blood pressure measures the force or pressure that the heart uses to pump blood.

• The ideal blood pressure is considered as 90/60mm Hg and 120/80mm Hg.

• It is measured in millimeters of mercury.

• There are two types of pressure:

• Systolic pressure - The pressure when the heart pushed out the blood and 120mm Hg is considered normal systolic pressure.

• Diastolic pressure - The pressure when the heart rests between the beats and 80mm Hg is considered normal diastolic pressure.

• The instrument used for measuring blood pressure - Sphygmomanometer

Q81. Answer: (c) 5

Calculation:

Here, we have x = √1125× √405over √729

=> x = √(5 × 225) × √5×81over √729

=> x = 15× 9 × 5 over 27

=> x = 25

=> √x = 5

Hence, the required value is 5.

Q82. Answer: (a) the change in savings per unit change in income of an individual

The correct answer is "the change in savings per unit change in income of an individual".

Key Points

• The fraction of increased income that is saved rather than consumed is known as the marginal propensity to save (MPS).

• MPS fluctuates with income and is generally greater at greater levels of income.

• MPS, a concept from Keynesian macroeconomic theory, is computed by dividing the change in income by the change in savings.

• The Keynesian multiplier, primarily explains the impact of additional funding or government expenditure as a boost to the economy, which is determined with the aid of MPS.

• The MPS of consumers can help economic experts predict how changes in government expenditure or capital spending would affect saving.

• A savings line, which has a slope due to the placement of change in savings on the vertical y-axis and change in income on the horizontal x-axis, is used to represent MPS.

• Therefore, In macroeconomic analysis, marginal propensity to save (MPS) is the change in savings per unit change in income of an individual.

Additional Information

• According to Keynesian economics, economic declines can be addressed or avoided by utilizing proactive public policy to control consumer spending.

• Keynes was an outspoken opponent of earlier economic views, which he described as "mainstream economics," and he created his views in the aftermath of the Great Depression.

• The main methods advocated by Keynesian economics to steer the economy and combat poverty are activist fiscal and financial policy.

• Because labor demand curves drop downward similar to any other regular demand curve, Keynesian theory contests the claim made by certain academics that lowering wages can bring about a reinstatement of full employment.

Q83. Answer: (a) 10

Shortcut Trick

Speed in km/h = 900 ÷ 25 = 36 km/h.

Convert km/h to m/s by multiplying with 5/18.

36 × (5/18) = 2 × 5 = 10 m/s.

Therefore The correct answer is 10 m/s.

Alternate Method

Given:

Distance = 900 km

Time = 25 hours

Formula Used:

Speed = Distance ÷ Time

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

Calculations:

=> Speed = 900 ÷ 25

=> Speed = 36 km/h

=> Speed in m/s = 36 × (5/18)

=> Speed in m/s = 10 m/s

Therefore The correct answer is 10 m/s.

Additional Information

Unit Conversion

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

Average Speed

Average Speed = Total Distance ÷ Total Time. For two equal distances with speeds x and y, Average Speed = 2xy/(x + y).

Relative Speed

When two objects move in the same direction, relative speed is the difference (s1 − s2). In the opposite direction, it is the sum (s1 + s2).

Q84. Answer: (d) 448

Shortcut Trick

Identify factors of 32 whose difference is 4.

Factors: 8 × 4 = 32 and 8 − 4 = 4.

Required difference between cubes = $8^3 - 4^3$.

Calculation: 512 − 64 = 448.

Therefore The correct answer is 448.

Alternate Method

Given: Difference (x − y) = 4 and Product (xy) = 32.

Formula Used: $x^3 - y^3 = (x - y)^3 + 3xy(x - y)$

=> $x^3 - y^3 = (4)^3 + 3 \times 32 \times 4$

=> $x^3 - y^3 = 64 + 384$

=> $x^3 - y^3 = 448$

Therefore The correct answer is 448.

Additional Information

Sum of Cubes Formula

$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$ or $(x + y)^3 - 3xy(x + y)$.

Difference of Cubes Factoring

$x^3 - y^3 = (x - y)(x^2 + xy + y^2)$.

Algebraic Relation

$(x + y)^2 = (x - y)^2 + 4xy$ used to find sum from difference.

Q85. Answer: (a) (9, 25, 7)

LOGIC: Second Number - (First Number × 2) = Third Number

Given:

(1, 6, 4) => 6 - (1 × 2) = 4

and

(3, 15, 9) => 15 - (3 × 2) = 9

Similarly, applying the same logic to the given options, we get

1) (9, 25, 7) => 25 - (9 × 2) = 7 (Follows).

2) (3, 18, 8) => 18 - (3 × 2) = 12 ≠ 8 (Does not follow).

3) (2, 16, 8) => 16 - (2 × 2) = 4 ≠ 8 (Does not follow).

4) (10, 33, 11) => 33 - (10 × 2) = 13 ≠ 11 (Does not follow).

Thus, the set (9, 25, 7) follows the same logic.

Hence, the correct answer is '(9, 25, 7)'.

Q86. Answer: (a) Co and Ni

The correct answer is "Co and Ni".

Key Points

• Newland arranged elements in their increasing order of atomic masses and found that every eighth element had the same properties.

• This attempt was the first to assign atomic numbers to each element.

• He gave the Law of Octaves.

• Newland placed Cobalt (Co) and Nickel (Ni) in the same group as they had similar properties.

Additional Information

• Newland's law was the first to be based on atomic weight.

• In this table, every element did not show similar properties after Calcium.

• At that time only 56 elements were known.

• Iron also had similar properties to Nickel and Cobalt but it was placed far more than these two.

Q87. Answer: (b) 5/18

Shortcut Trick

For a mixed recurring decimal like $0.ab\overline{c}$:

Numerator = (Full number after decimal) − (Non-repeating part) = 27 − 2 = 25

Denominator = (9 for every repeating digit) followed by (0 for every non-repeating digit) = 90

Fraction = 25/90 = 5/18

Therefore The correct answer is 5/18.

Alternate Method

Given: Number x = 0.2777...

Calculations:

=> Let x = 0.2777... — (Eq. 1)

=> Multiply (Eq. 1) by 10: 10x = 2.777... — (Eq. 2)

=> Multiply (Eq. 1) by 100: 100x = 27.777... — (Eq. 3)

=> Subtract (Eq. 2) from (Eq. 3):

=> 100x − 10x = 27.777... − 2.777...

=> 90x = 25

=> x = 25/90

=> x = 5/18

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Therefore The correct answer is 5/18.

Additional Information

Pure Recurring Decimal

If all digits after decimal repeat (e.g., $0.\bar{3}$), the denominator consists only of 9s (3/9 = 1/3).

Mixed Recurring Decimal

If some digits do not repeat, subtract the non-repeating part from the total number for the numerator.

Rational Numbers

Any terminating or repeating decimal can always be expressed in the p/q form where $q \neq 0$.

Q88. Answer: (c) North-west

According to the given information, the path followed by shalika is shown below,

Thus, she is in North- West direction from her house now.

Hence, the correct answer is 'North-West'.

Q89. Answer: (b) 450

Shortcut Trick

The product of the LCM and HCF of any two numbers is always equal to the product of the numbers themselves.

Required product = First number × Second number

Required product = 18 × 25 = 450

Therefore The correct answer is 450.

Alternate Method

Given:

The given numbers are 18 and 25.

Calculations:

=> Prime factorization of 18 = 2×3^2

=> Prime factorization of 25 = 5^2

=> Since there are no common prime factors between the two numbers, their highest common factor will be 1.

=> HCF (18, 25) = 1

=> To find the LCM, we multiply the highest powers of all prime factors present.

=> LCM (18, 25) = $2 \times 3^2 \times 5^2$

=> LCM (18, 25) = 2 × 9 × 25 = 450

=> Product of LCM and HCF = 450 × 1

=> Product = 450

Therefore The correct answer is 450.

Additional Information

LCM and HCF Relationship

For any two natural numbers 'a' and 'b', the product of their LCM and HCF is exactly equal to the product of the two numbers themselves: LCM(a, b) × HCF(a, b) = a × b. Note that this property applies strictly to pairs of numbers and not to three or more numbers.

Co-prime Numbers

Two numbers that have exactly 1 as their only common positive factor are known as co-prime or relatively prime numbers. For any pair of co-prime numbers, their HCF is always 1 and their LCM is always their direct product.

Fractions Rule

LCM of fractions = LCM of Numerators ÷ HCF of Denominators.

HCF of fractions = HCF of Numerators ÷ LCM of Denominators.

Q90. Answer: (c) 2310 cm^3

Shortcut Trick

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

Volume = (22/7) × 7 × 7 × 15

Volume = 22 × 7 × 15 = 154 × 15 = 2310 cm^3

Therefore The correct answer is 2310 cm^3.

Alternate Method

Given:

Radius (r) = 7 cm

Height (h) = 15 cm

Formula Used:

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

Calculations:

=> Volume = $(22/7) \times (7)^2 \times 15$

=> Volume = $(22/7) \times 49 \times 15$

=> Volume = $22 \times 7 \times 15$

=> Volume = 154×15

=> Volume = $2310\ cm^3$

Therefore The correct answer is $2310\ cm^3$.

Additional Information

Curved Surface Area (CSA) of Cylinder

The area of the curved part is given by $2\pi rh$.

Total Surface Area (TSA) of Cylinder

The sum of the CSA and the area of two circular bases: $2\pi r(h + r)$.

Volume of a Hollow Cylinder

If R is the outer radius and r is the inner radius, Volume = $\pi h(R^2 - r^2)$.

Q91. Answer: (a) 12

According to the given information, a certain number of people are sitting in a row facing north whose arrangement is shown below,

1) B is sitting third to the right of C. No one is sitting to the left of C.

2) Only four people are sitting between A and B.

3) Only four people are sitting between A and D and only two people are seated to the right of D.

Thus, as per the above arrangement, there are 12 persons seated between C and D.

Hence, the correct answer is '12'.

Q92. Answer: (b) Haryana

The correct answer is Haryana.

Key Points

• The fourth iteration of the Khelo India Youth Games will take place in 2022.

• The Khelo India Youth Games 2021, which had been delayed three times because of COVID-19, was conducted from June 4–13, 2022, in various locations.

• The fourth Khelo India Youth Games will take place in Haryana. The Khelo India Youth Games are slated for 2021, following the Tokyo Olympics. The venue for the Games will be Panchkula, Haryana.

• Kiren Rijiju, the minister of sports, and Manohar Lal Khattar, the chief minister of Haryana, made the announcement.

Additional Information

• Khelo India Youth Games

• Under-17-year-old school kids and under-21-year-old college students compete in the Khelo India Youth Games (KIYG), formerly known as the Khelo India School Games, which are held annually in January or February at the national level in India. To help them get ready for the international sporting events, the top 1,000 children would each receive an annual scholarship worth 5 lacks (US$6,300) for eight years.

• In its initial phase, the Training of Trainers (TOT) Program ran from December 2018 to January 2019.

• Throughout the months of December and January, a total of 160 trainers will receive training in 4 batches of 40 each. All interested teachers, principals, vice-principals, and physical education instructors will be included in this TOT Program, which will be conducted every two or four months.

Q93. Answer: (a) combination reaction

The correct answer is "combination reaction".

Key Points

• In a combination reaction, two or more elements or compounds combine to give a single product.

• Any number of reactants can participate in the reaction.

• These reactions are generally exothermic as a new bond is formed which leads to the release of energy.

• When metal and non-metal combine the product is ionic.

Additional Information

• Double-displacement reaction - In this type of reaction, two chemical substances react by exchanging ions to produce two new molecules. Positive ions are exchanged by negative ions.

• Dissociation reaction - A larger compound breaks into two or more components. The required energy is found in the form of heat. These are reversible in nature.

• Displacement reaction - In this, one reactant is displaced by another reactant. Displacement reactions are of two types: Singular displacement reaction and double displacement reaction.

Q94. Answer: (c) Bishnoi community

The correct answer is "Bishnoi community".

Key Points

• The Bishnoi community resides in western Rajasthan, close to the boundary with the Thar desert.

• They are people who value nature, and protecting forest wildlife has always been one of their core values.

• They adhere to the fundamental belief that all living creatures have the entitlement to survival and resource sharing.

• They have sacrificed their lives to preserve the plants and animals in order to safeguard the environment.

• An Amrita Devi Bishnoi National Honor for environmental protection was established by the Indian government.

• This accolade is given in honor of Amrita Devi Bishnoi, who gave her life, together with 363 others, in 1731 to preserve the Khejri trees in the Rajasthani settlement of Khejrali, close to Jodhpur.

• Therefore, the correct answer is: Bishnoi community

Additional Information

Community	Description
Vaishya community	• The status of someone being "twice-born," is shared by the Vaishyas with the two upper ranks of religious Brahmans and the powerful Kshatriyas—after they take on the holy woolen thread during the upanayana ritual. - This is when they experience their spiritual reincarnation. History has attributed the Vaishyas with helping Buddhism and Jainism, two reformist religions, grow.
Chhipa community	• The Chhipa is a group of people that specialize in clothing coloring and dying. They are Rajputs. - The community was first discovered in Rajasthan's Nagaur. - Following their relocation to Rajasthan and Gujarat, the tribe started a business that involved printing and dying clothing. - The population, which is primarily found in Rajasthan, speaks Marwari.
Bhil community	• One of the biggest tribal populations is the Bhil, who are found in the states of Rajasthan, Gujarat, Madhya Pradesh, Karnataka, and Andhra Pradesh. - The Bhil are renowned for being skilled archers who are also quite knowledgeable about their immediate surroundings. - Today, the majority of them work as farmers and farm laborers. Additionally, they are adept sculptors.

Q95. Answer: (d) 41/6

Shortcut Trick

For the quadratic equation $x^2 + 5x + 6 = 0$, the sum of roots $\alpha + \beta = -5$ and the product of roots $\alpha\beta = 6$.

The expression $\alpha\beta - (1/\alpha + 1/\beta)$ can be written as $\alpha\beta - [(\alpha + \beta) / \alpha\beta]$.

Substitute the values: $6 - (-5/6) = 6 + 5/6 = 41/6$.

Therefore The correct answer is 41/6.

Alternate Method

Given: The quadratic equation is $x^2 + 5x + 6 = 0$.

Comparing with the standard form $ax^2 + bx + c = 0$:

=> a = 1

=> b = 5

=> c = 6

We know the relationships between roots and coefficients:

=> Sum of roots (α + β) = −b/a = −5/1 = −5

=> Product of roots (αβ) = c/a = 6/1 = 6

Now, evaluate the required expression:

=> Value = αβ − (1/α + 1/β)

=> Value = αβ − [(α + β) / αβ]

=> Value = 6 − [(−5) / 6]

=> Value = 6 + 5/6

=> Value = (36 + 5) / 6

=> Value = 41/6

Therefore The correct answer is 41/6.

Additional Information

Sum and Product of Roots

For any quadratic equation $ax^2 + bx + c = 0$, the sum of roots is always $-b/a$ and the product of roots is c/a.

Quadratic Formula

The roots can also be found individually using $x = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$.

Nature of Roots

The value $D = b^2 - 4ac$ is the discriminant. If $D > 0$, roots are real and distinct; if $D = 0$, roots are real and equal; if $D < 0$, roots are complex/imaginary.

Q96. Answer: (d) Tusu

The correct answer is "Tusu".

Key Points

• The Tusu festival is primarily observed in Assam, the Tea-producing State, Northeastern Odisha, Southwest West Bengal, and Southeast Jharkhand.

• During this occasion, the goddess Tusu is worshipped. The focus is primarily on rivers. It is a unified expression of the agrarian society's shared trust and belief in the pleasure of crop gathering.

• It is thought that the term "Tusu" derives from the word "tush" for rice bran. Both a youthful child and a cosmic deity are representations of the Goddess Tusu.

• The ceremonies carried out during the Tusu Puja center on harvest-related ceremonies and songs of ethnic dedication chanted by women folk.

• Therefore, the Tusu festival is associated with Jharkhand.

Additional Information

Festival	Description
Losar	• The Tibetan New Year, Losar, which occurs in February, is also commemorated by welcoming loved ones to get-togethers. - The Gutor Chaam, which portrays the conflict between evil and goodness and the ritualized extermination of evil, is conducted in the Rumtek abbey two days before Losar.
Saga Dawa	• For Sikkimese Buddhists, the period of Saga Dawa, also known as the Triple Blessed Festival, is fortunate. - During the whole month, worship is held in different shrines. - The biggest festival falls on the full moon of this fourth Tibetan calendar quarter, known as Buddha Purnima in the Indian subcontinent.
Chavang Kut	• Many happy songs, dances, and celebrations are held to honor the event and show appreciation for the bumper crop. - It is also an opportunity for farmers and workers to enjoy a brief time away from work after a busy harvesting season.

Q97. Answer: (d) Care during prenatal, natal and post-natal period

The correct answer is Care during prenatal, natal, and post-natal.

Key Points

• Maternal health:-

• It is referred to the health of women during pregnancy, childbirth, and the period after childbirth.

• Prenatal period:

• It is that time of pregnancy during which checkups from doctors, and nurses are taken throughout the pregnancy.
• Routine checkups and tests are done to ensure the proper development of the baby and mother.
• This phase is also called pre-pregnancy care.
• Postpartum period:
• This period starts after childbirth and its ending is marked by hormone levels and uterus size.
• This majorly ends in 6 weeks.
• But this is considered to be the most neglected phase in the lives of mothers.

Additional Information

• Prenatal checkups are typically scheduled as:
• Every 4 or 6 weeks for the first 32 weeks.
• Every 2 or 3 weeks for the 32 to 37 weeks.
• Every week from the 37th week until delivery.
• Post-natal:
• Most of the deaths occur during this period.
• This period has three phases:
• Acute phase - 24 hours immediately after the delivery.
• Sub-Acute phase - can last up to 2-6 weeks after delivery.
• Late Phase - From 6 weeks - 6 months following delivery.

Q98. Answer: (a) Coca-Cola

The correct answer is "Coca-Cola".

Key Points

• IBM and Coca-Cola stopped operating in 1977 because they couldn't adhere to the Foreign Exchange Regulation Act, which prohibited international investors from owning more than 40% of Indian businesses.

• Following the 1977 elections, the Janata Party took office. In an effort to combat illegitimate wealth, Prime Minister Morarji Desai removed the legal tender validity from the 1,000, 5,000, and 10,000 rupee banknotes. Economic activity was impacted by Gandhi's ban on protests and the re-establishment of the union movement.

• He emphasized that IBM and Coca-Cola do not adhere to the Foreign Exchange Regulation Act, which stipulates that foreign investors are not permitted to possess more than 40% of Indian businesses. The two international corporations stopped operating in India.

• Therefore, the correct answer is: Coca-Cola

Additional Information

• The Foreign Exchange Regulation Act, also known as FERA, was first presented in 1973. The objective was to retain India's low foreign reserve status by regulating and controlling foreign exchange.

• This regulation restricted certain types of payments, supervised various foreign exchange operations, and kept an eye on transactions that affected exchange rates, imports, and export.

• FERA was passed with the intention of not just regulating and facilitating foreign exchange, but also of increasing international trade and payments and growing India's foreign exchange reserves.

• FERA violations are crimes that carry a direct prison sentence.

Q99. Answer: (a) Badminton Asia Championships 2022.

The correct answer is Badminton Asia Championships 2022.

Key Points

• Badminton Asia Championships 2022

• Sindhu won the bronze medal, her second medal at the competition, at the 2022 Badminton Asia Championships, in which she was ranked fourth.

• Throughout the quarterfinals, Sindhu overcame fifth seed He Bingjiao of China, who was the competition's fifth seed.

• In the 2014 Gimcheon version of the Asia Badminton Championships, she earned her maiden bronze medal.

• After defeating He Big Jiao of China in the quarterfinals by scores of 21-9, 13-21, and 21-19, Sindhu secured a medal in the competition.

• PV Sindhu won a bronze medal in May 2022 at Badminton Asia Championships 2022.

Additional Information

• P V Sindhu

• Indian badminton player Pusarla Venkata Sindhu is regarded as one of India's most accomplished athletes

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• She has won medals at numerous competitions, namely the Olympics and the BWF circuit, as well as a gold at the 2019 World Championships.

• The pinnacle of Sindhu's journey occurred in 2016 when she became the youngest as well as the first female Indian player to score a silver medal in the Olympics.

• Shortly afterward in the year, she was presented with The Padma Shri Award, India's fourth-highest civilian accolade.

Q100. Answer: (c) Maharashtra

The correct answer is Maharashtra.

Key Points

• Taramati Peak:-

• One of the two peaks of Harishchandragad is named Taramati. With a height of 1431 meters (4695 feet) above sea level, this peak is the sixth highest in Maharashtra State, right behind Salher.

• Due to its natural beauty, this location, which lies on the Harishchandragad Plateau, makes for an excellent hiking experience for both beginners and specialists.

• At the extreme border of the peak, a section of the thick jungle gives way to a grass path and some challenging rock climbs.

Additional Information

The top five mountain summits in India are as follows:

Mountain Peak	Height	Description
K2	8611 meters	• Between Baltistan and Xinjiang is where the Indian subcontinent's tallest peak is located. - In the Karakoram, it is the tallest peak.
Kangchenjunga	8586 meters	• The third-highest summit on Earth. - It is located in the Himalayan mountain range.
Nanda Devi	7816 meters	• Listed as the 23rd tallest peak on the planet. - The best high-altitude vegetation and animals can be found in the nearby Nanda Devi National Park. - The tallest mountain wholly within India is this one. - The Himalayan mountain ranges contain it.
Kamet	7756 meters	• In close proximity to the Tibetan Plateau. - It is situated in the region of Garhwal.
Saltoro Kangri	7742 meters	• It is close to the region of Siachen. - The Saltoro Kangri is listed as the world's 31st-highest freestanding peak. - It is located in the Karakoram Mountain range's Saltoro Range.

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