RRB Group D Previous Year Paper (Held on: 19 Sept 2022 Shift 1)

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

Take this paper as a timed mock test

Practise under exam conditions, then review your answers after you submit.

yourmocktest.com/pyq/rrb-group-d/rrb-group-d-previous-year-paper-held-on-19-sept-2022-shift-1

Scan the QR code or click the link to open it.

CBT

Q1. Suppose a proton moves towards the east by entering a uniform magnetic field in the downward direction. The direction of the force acting on the proton will be:

(a) towards the west
(b) towards the east
(c) towards the north
(d) towards the south

Q2. If '+' means '-', '-' means '×', '×' means '÷', '÷' means '+', what will come in place of the question mark (?) in the following equation?

44 ÷ 120 × 5 - 2 + 10 × 2 = ?

(a) 86
(b) 85
(c) 84
(d) 87

Q3. The value of (sin (90°-θ)cos (90°-θ)cot (90°-θ))/(cos² θ-1) is _____.

(a) -1
(b) 0
(c) 2 sin θ cos θ
(d) tan θ

Q4. In a queue, Mahima is 28^(th) from the front end and Anshul is 22^(nd) from the rear end, and there are 5 people between them. How many people are there in the queue if Anshul is standing somewhere behind Mahima in the queue?

(a) 55
(b) 56
(c) 54
(d) 53

Q5. Factorise (64x^6 - y^6).

(a) (2x - y)(2x + y)(4x² + 2xy - y²)(4x² - 2xy + y²)
(b) (2x - y)(2x + y)(4x2 - 2xy + y2)(4x2 - 2xy - y2)
(c) (2x - y)(2x + y)(4x2 + 2xy + y2)(4x2 - 2xy + y2)
(d) (2x - y)(2x + y)(4x2 + 2xy + y2)(4x2 - 2xy - y2)

Q6. Due to _____ phenomena, when light is passed through suspended particles in a medium, some portion of light is absorbed and emitted in all directions.

(a) dispersion of light
(b) scattering of light
(c) reflection of light

(d) refraction of light

Q7. _____ of trade refers to the type of goods and services a country exports and imports.

(a) Volume
(b) Value
(c) Gain
(d) Composition

Q8. The price of a laptop in a shop is decreased by 35%, as a result of which the sales increased by 20%. What is the effect on the total revenue of the shop from the sale of laptops?

(a) 10% decrease
(b) 22% decrease
(c) 10% increase
(d) 18% increase

Q9. What kind of roots does the quadratic equation $5x^2 + 7x + 4 = 0$ have?

(a) Real and unequal roots
(b) No real roots
(c) Real and equal roots
(d) Only one real root

Q10. Refer to the letter and symbol series, and answer the question that follows.

(Left) G H T % K & L M # S T * Q @ N U (Right)

How many symbols are there between the seventh element from the right end and the fifth element from the left end of the given series?

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

Q11. Majuli, in the _____, is the largest inhabited riverine island in the world.

(a) Ganga river
(b) Yamuna river
(c) Brahmaputra river
(d) Godavari river

Q12. Which of the following is the standard representation of quadratic equation $(x - 4)(x + 1) = 2$?

(a) $x^2 - x - 2 = 0$
(b) x2 - 3x - 4 = 0
(c) x2 - 3x - 6 = 0
(d) x2 - 4x - 2 = 0

Q13. Which of the following numbers will replace the question mark (?) in the given series?

8 13 17 20 22 ?

(a) 24
(b) 23
(c) 25
(d) 22

Q14. Which of the following statements is INCORRECT about AIDS?

(a) The virus can be transmitted by shaking hands with a person infected with HIV.
(b) The virus can pass on to a normal person from an infected person by sharing the syringes used for injecting drugs.
(c) The virus can be transmitted through sexual contact with a person infected with HIV.
(d) The virus can be transmitted to an infant from the infected mother through her milk.

YourMockTest.com — Free Study Material

Q15. Anu, Dilip, Eshwar, Jahanvi, Komal, Pallavi, Riya, and Tara are sitting around a square table facing the centre of the table (but not necessarily in the same order). Some of them are sitting at the corners, while some are sitting at the exact centre of the sides. Tara is to the immediate right of Komal and to the immediate left of Jahanvi. Anu is to the immediate left of Riya. Dilip and Jahanvi have only one person between them. Eshwar is sitting at the exact centre of one of the sides and has Riya to the immediate left and Komal to the immediate right.

Who is sitting to the immediate right of Pallavi?

(a) Anu
(b) Dilip
(c) Jahnavi
(d) Tara

Q16. Which group in the Modern Periodic Table has only two non-metallic element?

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

Q17. Which of the following parts is responsible to give a specific colour to the eyes?

(a) Iris
(b) Lens
(c) Retina
(d) Cornea

Q18. Each of six friends has a different height. Anant is taller than Gagan. Manoj is shorter than Janak. Parth is taller than Janak but shorter than Gagan. If Anurag is the shortest, then who is the tallest among them?

(a) Anant
(b) Manoj
(c) Parth
(d) Janak

Q19. The lengths of corresponding sides of two similar triangles are in the ratio 5 : 6. The areas of these triangles are in the ratio:

(a) 25 : 36
(b) 16 : 42
(c) 3 : 4
(d) 36 : 25

Q20. The radius of the base of a cylinder is increased from 4 cm to 16 cm, but its curved surface area remains unchanged. If the initial height of the cylinder was 4 cm, what will be its new height?

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

Q21. Which of the following forms the lining of kidney tubules and duets of salivary glands?

(a) Squamous epithelium
(b) Columnar epithelium
(c) Glandular epithelium
(d) Cuboidal epithelium

Q22. Islam is a major world religion promulgated by the Prophet Muhammad in Arabia in the:

(a) 7^(th) century
(b) 6^(th) century
(c) 5^(th) century
(d) 4^(th) century

YourMockTest.com — Free Study Material

Q23. Dipika Pallikal and Joshna Chinappa won the doubles title at the World Championships in which sport on 9 April 2022?

(a) Table Tennis
(b) Badminton
(c) Squash
(d) Lawn tennis

Q24. Three statements are given, followed by three conclusions numbered I, II and III. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:

All anklets are printers.

Some printers are birds.

Some birds are cherries.

Conclusions:

I. Some birds are printers.

II. All printers are anklets.

III. Some cherries are birds.

(a) Only conclusion I follows.
(b) Only conclusion II follows.
(c) None of the conclusions follow.
(d) Both conclusions I and III follow.

Q25. If 10 : 16 :: 30 : y, then find the value of y.

(a) 54
(b) 42
(c) 48
(d) 40

Q26. In this question, a statement is followed by two conclusions. Which of the two conclusions is/are true with respect to the statement?

Statement:

$E < T = D \leq Q > Z = G$

Conclusions:

I. $T < G$

II. $Z > D$

(a) Only conclusion I is true
(b) Both conclusions I and II are true
(c) Neither conclusion I nor II is true
(d) Only conclusion II is true

Q27. Which Union Territory launched two women's squads headed by Khalida Parveen, for ensuring the safety and security of women in February 2022?

(a) Chandigarh
(b) Ladakh
(c) Puducherry
(d) Jammu And Kashmir

Q28. If in the word 'BOARD' all the letters are arranged in alphabetical order from left to right, then the position of how many letters will be remain unchanged?

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

YourMockTest.com — Free Study Material

(d) Four

Q29. The distance between two stations, Delhi and Amritsar is 450 km. A train starts at 4 p.m. from Delhi and moves towards Amritsar at an average speed of 60 km/h. Another train starts from Amritsar at 3:20 p.m. and moves towards Delhi at an average speed of 80 km/h. At what distance from Delhi will the two trains meet?

(a) 165 km
(b) 160 km
(c) 180 km
(d) 170 km

Q30. Select the option that is related to the seventh number in the same way as the second number is related to the first number, the fourth number is related to the third number and the sixth number is related to the fifth number.

25 : 4 :: 49 : 6 :: 9 : 2 :: 100 :?

(a) 4
(b) 7
(c) 6
(d) 9

Q31. In an electrical circuit four identical bulbs are connected in parallel to each other to a battery of 10 V (negligible internal resistance). When all the four bulbs glow, a current of 4 A is recorded. Then the power dissipated in the circuit and the resistance of each bulb are _____ and _____, respectively.

(a) 50 W, 15 Ω
(b) 30 W, 15 Ω
(c) 25 W, 40 Ω
(d) 40 W, 10 Ω

Q32. Which of the following expressions is correct?

1. Mode - median = 2 (median - mean)
2. Median = (Mode + median)/2
3. Mode = 2 Median - mean
4. Mean = (2Median - mode)/2

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

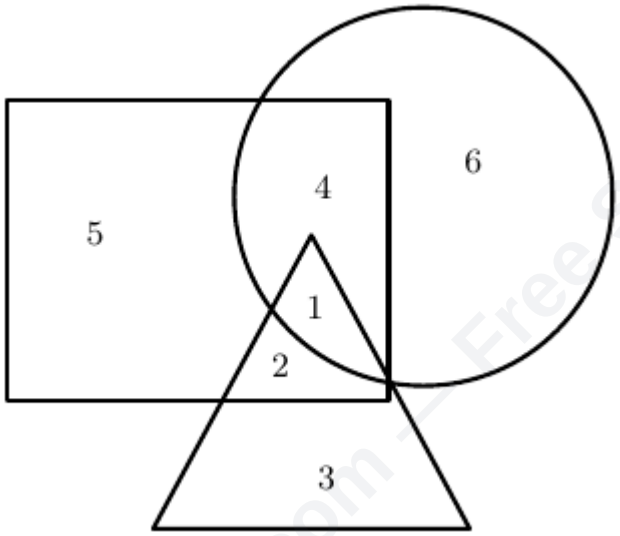
Q33. Simplify the given expression.

11 - {7 - 56 ÷ (2 × 3 + 1)}

(a) 9
(b) 11
(c) 10
(d) 12

Q34. Study the given diagram carefully and answer the question. The numbers in different sections indicate the number of persons. The circle represents ‘men’, the square represents ‘photographers’, and the triangle represents ‘musicians’. How many men are there who are NEITHER photographers NOR musicians?

YourMockTest.com — Free Study Material



(a) 2
(b) 4
(c) 5
(d) 6

Q35. Which of the following pairs of numbers are co-prime?
(a) 51, 119
(b) 65, 91
(c) 59, 97
(d) 133, 171

Q36. In the reference of Constitution of India, who, was the elected president of the Constituent Assembly from following?
(a) Jawahar Lal Nehru
(b) Dr. BR Ambedkar
(c) Dr. Rajendra Prasad
(d) Lal Bahadur Shastri

Q37. Which of the following numbers will replace the question mark (?) in the given series?
15, 16, 32, 35, 140, ?
(a) 145
(b) 144
(c) 142
(d) 700

Q38. Lala Lajpat Rai was associated with the _____ since 1921.
(a) Servants of the People Society
(b) Satyashodhak Samaj
(c) Sarbatatyadipika Sabha
(d) Chinmaya Mission

Q39. Which of the following compounds gets precipitated when lead nitrate solution is mixed with sodium iodide solution?
(a) Sodium nitrite
(b) Lead iodide
(c) Lead nitrite
(d) Sodium nitrate

YourMockTest.com — Free Study Material

Q40. In a queue, Rahul is 21^(st) from the front end and Ankit is 10^(th) from the rear end, and there are 4 people between them. How many people are there in the queue if Ankit is standing somewhere behind Rahul in the queue?

(a) 36
(b) 37
(c) 38
(d) 35

Q41. The compound interest in 2 years on Rs. 30,000 at 7% interest per annum, compounded annually, is _____.

(a) Rs. 4,777
(b) Rs. 4,447
(c) Rs. 4,437
(d) Rs. 4,347

Q42. 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.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. EXAMPLE: 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)

3 : 25 :: 8 : 100 :: 12 : ?

(a) 196
(b) 144
(c) 225
(d) 169

Q43. If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 5613743658, which of the following digits will be second from the left?

(a) 6
(b) 4
(c) 2
(d) 3

Q44. The Government of India, on January 2022, approved the Production Linked Incentive (PLI) Scheme 'National Programme on Advanced Chemistry Cell (ACC) Battery Storage with a budgetary outlay of _____.

(a) Rs. 21,100 crore
(b) Rs. 19,100 crore
(c) Rs. 18, 100 crore
(d) Rs. 20,100 crore

Q45. 1 commercial unit of electrical energy is equal to _____ joules.

(a) 3.6 × 10^5
(b) 3.6 × 10^6
(c) 3.6 × 10^7
(d) 3.6 × 10^8

Q46. Which Lok Sabha was constituted after the General Elections to Lok Sabha, 2019?

(a) 17^(th)
(b) 16^(th)
(c) 18^(th)
(d) 15^(th)

Q47. The direction of the magnetic field produced by the current carrying solenoid is:

(a) parallel to the axis of the solenoid
(b) perpendicular to the axis of the solenoid
(c) parallel to the direction of the current
(d) parallel to the diameter of the solenoid

YourMockTest.com — Free Study Material

Q48. On entering Amrit Kaal, the 25 year long lead up to India @100, the Union Budget 2022-23 provides impetus for growth along _____ priorities.

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

Q49. Two consecutive numbers are such that one-fourth of the smaller number exceeds one-fifth of the larger number by 3. The larger number is _____.

(a) 75
(b) 25
(c) 45
(d) 65

Q50. The position of how many letters will remain unchanged if each of the letters in the word 'SHIRT' is arranged in alphabetical order?

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

Q51. Which of the following elements is a metal?

(a) Germanium
(b) Sodium
(c) Bromine
(d) Neon

Q52. Given below are two letter-cluster pairs in which the second letter-cluster is related to the first letter-cluster following a certain logic. Select the letter-cluster pair from among the options that follows the same logic.

NZF : FAN

HSE : EHH

(a) CPN : NKC
(b) CPN : NQC
(c) CPN : NEC
(d) CPN : NFC

Q53. Two adjacent angles of a parallelogram are such that one is two-thirds the other. Find the measure of the smaller angle.

(a) 36°
(b) 72°
(c) 18°
(d) 108°

Q54. Each of the six graduate students, Anudeep, Yamuna, Chinmayi, Divija, Esha and Guna, has an online PG entrance exam on a different day of a week, starting from Monday and ending on Saturday of the same week, but not necessarily in the same order. None of them have the exam before Chinmayi and after Yamuna. Guna has the exam immediately after Anudeep and immediately before Divija. Esha has the exam on Tuesday and immediately before Anudeep.

Who among the following has the exam on Friday?

(a) Yamuna
(b) Anudeep
(c) Divija
(d) Guna

YourMockTest.com — Free Study Material

Q55. Doddabetta peak, which means a big mountain, is the highest mountain peak in the _____

(a) Ananthagiri Hills
(b) Nilgiri Hills
(c) Cardamom Hills
(d) Shevaroy Hills

Q56. What happens when we exhale during normal breathing?

(a) A residual amount of air remains in the lungs
(b) The diaphragm is flattened
(c) The lungs are contracted
(d) All carbon dioxide is expelled from the body

Q57. Three statements are given, followed by three conclusions numbered I, II and III. You have to consider these statements to be true, even if they seem at variance from commonly known facts. Decide which of the given conclusions logically follow/s from the given statements.

Statements:

All sachets are bags.

Some bags are clocks.

No clock is a toaster.

Conclusions:

I. Some toasters are clocks.

II. No sachet is a toaster.

III. Some bags are sachets.

(a) Only conclusions I and II follow.
(b) Only conclusion III follows.
(c) Only conclusions II and III follow.
(d) Only conclusion I follows.

Q58. Which of the following is INCORRECT regarding the flow of energy between various components of the environment?

(a) The amount of organic matter present at each trophic level is 10%.
(b) Energy flow is unidirectional.
(c) Green plants capture about 10% of the solar energy that falls on leaves.
(d) Every trophic level loses some energy as heat to the environment.

Q59. The cost of a pen is twice the cost of a pencil. If the cost of the pencil is Rs. 1, the cost of 3 pens and 2 pencils is:

(a) Rs. 7
(b) Rs. 2
(c) Rs. 10
(d) Rs. 8

Q60. If the ratio of the areas of two squares is 2 : 3, then the ratio of the perimeters of these two squares, in the order mentioned, is _____.

(a) $\sqrt{2} : \sqrt{3}$
(b) $2 : \sqrt{3}$
(c) 4 : 9
(d) $\sqrt{2} : 3$

Q61. The greatest number which on dividing 50, 58 and 69 leaves remainders of 1, 2 and 6, respectively, is:

(a) 8
(b) 6
(c) 7
(d) 0

YourMockTest.com — Free Study Material

Q62. Ferrous sulphate on heating gives a solid product and two different gases. Select the gases evolved during the reaction.

(a) Oxygen and disulphur
(b) Sulphur trioxide and oxygen
(c) Sulphur dioxide and oxygen
(d) Sulphur dioxide and sulphur trioxide

Q63. A salt is dissolved in water and the pH of this salt solution is measured with a universal indicator paper. If the pH of solution is more than 7, the salt is most likely to be

(a) K2CO3
(b) Na2SO4
(c) KCl
(d) NH4Cl

Q64. Sangam literature was composed in which classical language?

(a) Odiya
(b) Malayalam
(c) Sanskrit
(d) Tamil

Q65. At which of these places is the thickness of the troposphere the greatest?

(a) South Pole
(b) Equator
(c) Above Mountains
(d) North Pole

Q66. Which of the following is NOT an elected functionary?

(a) Chairman - Municipal Corporation
(b) Chairman - District Board
(c) Executive Officer - Municipal Board
(d) Chairman - Municipal Board

Q67. The value of 0.877... is _____.

(a) 7over 90
(b) 87over 9
(c) 79over 90
(d) 8over 90

Q68. If Rs. 3.50 : Rs. 7.50 :: Rs. 8.26 : x, then what is the value of x?

(a) Rs. 17.70
(b) Rs. 17.00
(c) Rs. 18.10
(d) Rs. 17.85

Q69. Pallavi starts walking towards the north and after covering a distance, she turns to the right, then again to the right and after covering some more distance, she again turns to the right. Now, in which direction is she facing? (All turns are 90 degree turns only)

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

YourMockTest.com — Free Study Material

Q70. If a pin is placed in front of the converging lens at a distance of 20 cm, the converging lens forms an image that is real, inverted and equal to the size of the object. Then the power of the lens is:

(a) +10 D
(b) +5D
(c) -5D
(d) -10 D

Q71. The e-PGPathshala scheme of the Government of India is related to which of the following?

(a) Secondary education
(b) Nursery education
(c) Higher education
(d) Primary education

Q72. Which of the following statements is correct for saturated carbon compounds?

(a) They have carbon-carbon double bond only.
(b) They have carbon-carbon single bond only.
(c) They have carbon-carbon triple bond only.
(d) They have both double and triple bond.

Q73. If '+' means '÷', '-' means '×', '×' means '+', '÷' means '-', what will come in place of the question mark (?) in the following equation?

81 ÷ 3 - 14 ÷ 7 × 6 + 6 - 5 = ?

(a) 55
(b) 37
(c) 43
(d) 50

Q74. Which of the following statements about conductivity of electricity in ionic compounds is correct?

(a) Ionic compounds are bad conductors of electricity in both solid as well as in molten state.
(b) Ionic compounds conduct electricity in solid state but not in molten state.
(c) Ionic compounds conduct electricity in molten state but not in solid state.
(d) Ionic compounds conduct electricity in both solid as well as in molten state.

Q75. Seven toy cars and five toy bikes together cost Rs. 600. Five toy cars and three toy bikes together cost Rs. 400. The cost of each toy car is:

(a) Rs. 200
(b) Rs. 150
(c) Rs. 100
(d) Rs. 50

Q76. What is the primary function of money?

(a) It is a store house of goods
(b) It is a medium of exchange
(c) It is the basis of debit
(d) It is the basis of distribution of income

Q77. The radius of curvature of a spherical mirror is the distance between:

(a) pole and principal focus
(b) centre of curvature and infinity
(c) principal focus and centre of curvature
(d) centre of curvature and pole

YourMockTest.com — Free Study Material

Q78. Suppose Sita has kept a needle in front of a concave mirror of focal length f at a distance (f + x) and a real image of the needle is seen on a screen at a distance (f + y). Then the focal length f can be expressed as:

(a) f = -√xy
(b) f = -2√xy
(c) f = √xy
(d) f = 2√xy

Q79. Which of the following letter-clusters will replace the question mark (?) in the given series to make it logically complete?

MON 4, QSR 10, UWV 16, YAZ 22, ?

(a) DED 25
(b) CED 28
(c) AED 24
(d) CFD 28

Q80. Carbon shows greater tendency for catenation than silicon.

Which of the following statements is the correct explanation for the given assertion?

(a) Carbon-carbon bond is weaker than Si-Si bond due to the larger size of carbon as compared to silicon.
(b) Carbon-carbon bond is weaker than Si-Si bond due to the smaller size of carbon as compared to silicon.
(c) Carbon-carbon bond is stronger than Si-Si bond due to the larger size of carbon as compared to silicon.
(d) Carbon-carbon bond is stronger than Si-Si bond due to the smaller size of carbon as compared to silicon.

Q81. Who among the following is popularly known as 'Waterman of India'?

(a) Dr. MS Swaminathan
(b) Dr. Arun Krishnsnan
(c) Dr. Rajendra Singh
(d) Dr. Hiralal Chaudhuri

Q82. Which of the following is a heterotrophic organism?

(a) Neem tree
(b) Tiger
(c) Algae
(d) Grass

Q83. Buhsu Jiba is a festival celebrated in the state of _____.

(a) Sikkim
(b) Nagaland
(c) Himachal Pradesh
(d) Odisha

Q84. Rohit started on his bicycle from his home and travelled a distance of 5 km in the south direction. He then turned towards the right and travelled a distance of 2.5 km, and again took a turn towards the right and travelled a distance of 5 km. Finally, after taking a left turn, he travelled a distance of 5 km. What is the shortest distance between his present location and his home? (All turns are 90 degree turns only)

(a) 7.5 km
(b) 6.5 km
(c) 9.5 km
(d) 8.5 km

Q85. Adolescence begins around the age of 11 and lasts upto:

(a) 15 or 16 years of age
(b) 16 or 17 years of age
(c) 18 or 19 years of age
(d) 19 or 20 years of age

YourMockTest.com — Free Study Material

Q86. Anand bought a car for Rs. 8,00,000 and sold it a profit of 5% to Dhiraj. Dhiraj sold it at a loss of 4% to Anil. What is the amount paid by Anil for the car?

(a) Rs. 8,06,400
(b) Rs. 8,73,600
(c) Rs. 8,40,000
(d) Rs. 8,60,000

Q87. In this question, a group of letters is coded using symbols as per the table given below and the conditions which follow. The correct combination of codes following the conditions is your answer.

Letters	D	T	V	O	I	A	P	E
Codes	@		^	%	=	#	$	•

Conditions:

i. If both the first and the last letters of the word are vowels, then both these letters will be coded as '&'.

ii. If both the first and the last letters of the word are consonants, then both these letters will be coded as '*'.

What will be the code for the word 'ADOPTIVE'?

(a) & @ % $ > = ^ &
(b) @ % $ > = ^ &
(c) & @ % $ > = ^ +
(d) @ % $ > = ^ +

Q88. simplify the given expression.

11.456565... ÷ 2.6767...

(a) 47/25
(b) 37/25
(c) 34/25
(d) 42/25

Q89. If 14 April 2005 is a Thursday, then what will be the day of the week on 10 May 2017?

(a) Wednesday
(b) Friday
(c) Thursday
(d) Tuesday

Q90. Six doctors are sitting in a row facing north, Omprakash is sitting third to the left of Tanvi, who is sitting second to the right of Matank. Yadhu is sitting to the immediate right of Sunil, who is sitting somewhere to the left of Omprakash. Neither Yadhu nor Karuna sit at the extreme ends. What is Karuna's position with respect to Yadhu?

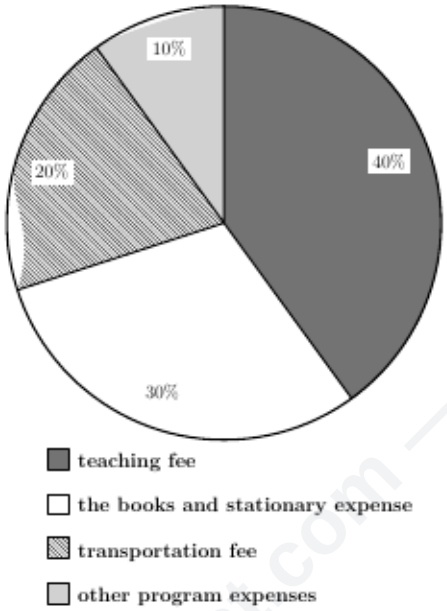
(a) Fourth to the right
(b) Fourth to the left
(c) Third to the left
(d) Third to the right

Q91. A 10 Ω resistor is connected across a battery. The heat produced in the resistor in 5 seconds is 200 J. The potential difference across the resistor is:

(a) 20 V
(b) 30 V
(c) 10 V
(d) 40 V

Q92. The percentage expenditure of a school is shown in the following pie-chart. Study the pie-chart and answer the question.

YourMockTest.com — Free Study Material



The total income is Rs. 27,00,000. What is the amount spent on teaching fee and transportation fee if the total school expense is one-third of the total income?

(a) Rs. 7,50,000
(b) Rs. 4,30,000
(c) Rs. 9,00,000
(d) Rs. 5,40,000

Q93. The total amount payable for completing a piece of work is Rs. 800. C can do it alone in 24 days, while B can do it alone in 8 days. With the help of A, they complete this work in 3 days. What is the sum of money received by A as his share in completing the work?

(a) Rs. 400
(b) Rs. 450
(c) Rs. 300
(d) Rs. 350

Q94. In the psychology of motivation, balance theory is a theory of attitude change, proposed by _____.

(a) John A List
(b) Fritz Heider
(c) Milton Friedman
(d) Adam Smith

Q95. What happens during menstruation?

(a) There is failure of fertilisation of the ovum
(b) The uterine lining is shed.
(c) The wall of the uterus becomes vascular
(d) A mature egg is released from an ovary

Q96. In November 2021, Manisha Kalyan scored India's first-ever goal against _____ in senior level football.

(a) Germany
(b) Brazil
(c) Sweden
(d) France

Q97. Read the given statement and the arguments carefully and select the appropriate answer from the given options.

Statement:

Education is the backbone of human society.

Arguments:

I. Schools are learning centres of societal norms and regulations.

II. Any society with less concern about education, cannot grow and develop in present times.

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

Q98. The median of the observations below, given in ascending order, is n - 1.

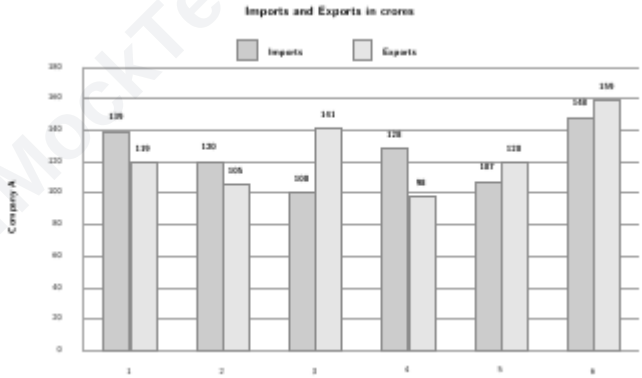
4, 8, n - 14, 17, n + 5, 30, 32 and 35

What is the value of n?

(a) 17
(b) 18
(c) 24
(d) 19

Q99. The given bar graph shows the exports and imports of Company A over a period of time. Study the bar graph and answer the question that follows.

The numbers 1 to 6 in the graph represent the years from 2001 to 2006.



What is the average of the imports for the period 2001 to 2006 (in crores)?

(a) 56.61
(b) 80.24
(c) 172.40
(d) 123.66

Q100. In a certain code language, 'BOY is written as 'ACNPXZ' and 'TOY' is written as 'SUNPXZ'. How will 'JOY' be written in that code language?

(a) IKXZNP
(b) ZXPNKI
(c) IKNPXZ
(d) XZNPIK

ANSWER KEY

1	c	2	d	3	a	4	a	5	c	6	b	7	d	8	b	9	b	10	c
11	c	12	c	13	b	14	a	15	b	16	c	17	a	18	a	19	a	20	d
21	d	22	a	23	c	24	d	25	c	26	c	27	d	28	b	29	d	30	d
31	d	32	a	33	d	34	d	35	c	36	c	37	a	38	a	39	b	40	d
41	d	42	a	43	b	44	c	45	b	46	a	47	a	48	a	49	d	50	c
51	b	52	a	53	b	54	c	55	b	56	a	57	b	58	c	59	d	60	a
61	c	62	d	63	a	64	d	65	b	66	c	67	c	68	a	69	b	70	a

YourMockTest.com — Free Study Material

71	c	72	b	73	b	74	c	75	d	76	b	77	d	78	c	79	b	80	d
81	c	82	b	83	b	84	a	85	c	86	a	87	a	88	a	89	a	90	d
91	a	92	d	93	a	94	b	95	b	96	b	97	a	98	c	99	d	100	c

SOLUTIONS

Q1. Answer: (c) towards the north

The correct answer is towards the north.

Key Points

• A proton moves towards east by entering an uniform magnetic field in the downward direction. so, the proton is deflected in a mutually perpendicular direction to the magnetic field.

• Using Fleming's left hand rule, it is towards the north direction.

Additional Information

• Fleming's left hand rule states stretching the forefinger, middle finger and thumb in such a way that they are mutually perpendicular to each other.

• Forefinger points in the direction of the magnetic field, the middle finger points in the direction of current and the thumb points in the direction of force.

Q2. Answer: (d) 87

Given:

44 ÷ 120 × 5 - 2 + 10 × 2 = ?

Concept:

According to the given question,

Sign	•	•	×	÷
Means	•	×	÷	•

Replacing the given sign in the given problem, we get:

44 + 120 ÷ 5 × 2 - 10 ÷ 2 = ?

According to BODMAS rule,

44 + 120 ÷ 5 × 2 - 10 ÷ 2 = ?

= 44 + 24 × 2 - 5

= 44 + 48 - 5

= 92 - 5

= 87

Q3. Answer: (a) -1

Shortcut Trick

Put θ = 45° to simplify the expression directly.

Numerator: sin(45°) × cos(45°) × cot(45°) = (1/√2) × (1/√2) × 1 = 1/2.

Denominator: cos²(45°) − 1 = (1/√2)² − 1 = 1/2 − 1 = −1/2.

Result: (1/2) ÷ (−1/2) = −1.

Therefore The correct answer is -1.

Alternate Method

Given: Expresssion = [sin(90°−θ) × cos(90°−θ) × cot(90°−θ)] / [cos²θ − 1]

Formula Used: sin(90°−θ) = cosθ; cos(90°−θ) = sinθ; cot(90°−θ) = tanθ; sin²θ + cos²θ = 1

=> Numerator = cosθ × sinθ × tanθ

=> Numerator = cosθ × sinθ × (sinθ / cosθ) = sin²θ

=> Denominator = cos²θ − 1 = −(1 − cos²θ) = −sin²θ

=> Final Value = sin²θ / (−sin²θ) = −1

Therefore The correct answer is -1.

Additional Information

Complementary Angle Identities

YourMockTest.com - Free Study Material

Functions change to their co-functions in the first quadrant: sin ↔ cos, tan ↔ cot, and sec ↔ cosec.

Pythagorean Identities

The fundamental identity is $\sin^2\theta + \cos^2\theta = 1$, which implies $\cos^2\theta - 1 = -\sin^2\theta$ and $\sin^2\theta - 1 = -\cos^2\theta$.

Q4. Answer: (a) 55

Given:

The position of Mahima from the front end is 28th

The position of Anshul from the rear end is 22nd

People in between Mahima and Anshul = 5

According to the given information, the diagram will be,

Total number of people present in Queue: 28 + 5 + 22 = 55

The correct answer is: '55'.

Q5. Answer: (c) (2x - y)(2x + y)(4x2 + 2xy + y2)(4x2 - 2xy + y2)

Shortcut Trick

Identify the expression as a difference of squares: $(8x^3)^2 - (y^3)^2$.

Apply $a^2 - b^2 = (a - b)(a + b)$ to get $(8x^3 - y^3)(8x^3 + y^3)$.

Recognize $8x^3$ as $(2x)^3$ and factorize both the difference and sum of cubes.

The factors are $(2x - y)(4x^2 + 2xy + y^2)$ and $(2x + y)(4x^2 - 2xy + y^2)$.

Therefore The correct answer is $(2x - y)(2x + y)(4x^2 + 2xy + y^2)(4x^2 - 2xy + y^2)$.

Alternate Method

Given: 64x^6 − y^6

Formula Used:

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

Calculations:

=> 64x^6 − y^6 = $(8x^3)^2 - (y^3)^2$

=> $(8x^3 - y^3)(8x^3 + y^3)$

=> $[(2x)^3 - y^3] \times [(2x)^3 + y^3]$

=> $[(2x - y)((2x)^2 + (2x)(y) + y^2)] \times [(2x + y)((2x)^2 - (2x)(y) + y^2)]$

=> $(2x - y)(4x^2 + 2xy + y^2) \times (2x + y)(4x^2 - 2xy + y^2)$

=> $(2x - y)(2x + y)(4x^2 + 2xy + y^2)(4x^2 - 2xy + y^2)$

Therefore The correct answer is $(2x - y)(2x + y)(4x^2 + 2xy + y^2)(4x^2 - 2xy + y^2)$.

Additional Information

Difference of Squares

An algebraic expression of the form $a^2 - b^2$ can always be factorized into $(a + b)(a - b)$.

Difference and Sum of Cubes

$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$ and $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$ are essential for higher power factorizations.

Power of a Power Rule

x^(mn) can be written as $(x^m)^n$ or $(x^n)^m$, which helps in identifying square or cube forms.

Q6. Answer: (b) scattering of light

The correct answer is scattering of light.

Key Points

• When white light from the sun enters the earth's atmosphere, the light gets scattered i.e. the light spreads in all directions by dust particle, free water molecule, and molecules of gases present in the atmosphere. This is called the scattering of light.

• During the scattering of light, some of the light is absorbed and the rest is scattered.

Additional Information

• When white light passes through the glass prism it splits into the seven constituent colors, this phenomenon is called dispersion of light.

• When a ray of light reaches a smooth polished surface it bounces back, it is called reflection of light.

• The bending of light as it passes from one substance to another, it is called refraction of light.

Q7. Answer: (d) Composition

The correct answer is Composition.

Key Points

• The composition of trade refers to the types of goods and services a country exports and imports.

• It encompasses the variety and complexity of products and services exchanged in international trade.

• The composition can be determined by various factors, including a country's resources, technological capabilities, industrial structure, and policies.

• It reflects a country's economic strength and competitiveness on the global stage.

• Countries with a diverse trade composition are usually more resilient to economic shocks because they don't rely on a single type or category of goods for their export earnings.

• Over time, the composition of trade can change as a country develops, diversifies its economy, or adopts new technologies.

Additional Information

Factors	Description
Volume	• The volume of trade refers to the quantity of goods and services traded. - It doesn't tell us anything about the types of goods and services being exchanged, just the amount.
Value	• The value of trade refers to the monetary worth of goods and services traded. - It tells us about the total dollar value of the exports and imports, but not specifically about the types of goods and services.
Gain	• The gain from trade refers to the net benefit or advantage that a country gets from participating in international trade. - This could be economic (increased income, jobs), social (access to diverse goods), or strategic. - It doesn't refer directly to the types of goods and services a country exports and imports.

Q8. Answer: (b) 22% decrease

Shortcut Trick

Apply the successive percentage change formula: Net Change = a + b + (a × b)/100

Here, price decrease (a) = −35% and sales increase (b) = +20%.

Net Change = −35 + 20 + (−35 × 20)/100

Net Change = −15 − 700/100 = −15 − 7 = −22%

Negative sign indicates a decrease.

Therefore The correct answer is 22% decrease.

Alternate Method

Given:

Price change = −35% | Sales change = +20%

Formula: Revenue = Price × Quantity Sold

Let Initial Price = 100 and Initial Sales = 100

=> Initial Revenue = 100 × 100 = 10000

=> New Price = 100 − 35% of 100 = 65

=> New Sales = 100 + 20% of 100 = 120

=> New Revenue = 65 × 120 = 7800

=> Change in Revenue = 7800 − 10000 = −2200

=> Percentage Change = (−2200 / 10000) × 100 = −22%

Therefore The correct answer is 22% decrease.

Additional Information

Product Stability Rule

When the product of two variables (Price × Consumption) is constant, if one increases by r%, the other must decrease by [r/(100+r)] × 100%.

Successive Percentage Formula

For two successive changes of x% and y%, the net effective change is given by [x + y + (xy/100)]%.

Revenue and Price Elasticity

Revenue increases only if the percentage increase in quantity sold is greater than the percentage decrease in price.

Q9. Answer: (b) No real roots

Shortcut Trick

To find the nature of roots, calculate the discriminant (D) = $b^2 - 4ac$.

For the equation $5x^2 + 7x + 4 = 0$, we have a = 5, b = 7, and c = 4.

$D = 7^2 - 4 \times 5 \times 4 = 49 - 80 = -31$.

As D < 0, the roots are imaginary and not real.

Therefore The correct answer is No real roots.

Alternate Method

Given: The quadratic equation is $5x^2 + 7x + 4 = 0$.

Formula Used:

The standard form of a quadratic equation is $ax^2 + bx + c = 0$.

The nature of roots is determined by the Discriminant (D):

1. If D > 0, roots are real and unequal.

2. If D = 0, roots are real and equal.

3. If D < 0, roots are not real (imaginary).

Where $D = b^2 - 4ac$.

Calculations:

Comparing $5x^2 + 7x + 4 = 0$ with $ax^2 + bx + c = 0$:

=> a = 5

=> b = 7

=> c = 4

=> $D = b^2 - 4ac$

=> $D = (7)^2 - 4 \times 5 \times 4$

=> $D = 49 - 80$

=> $D = -31$

Since the value of the discriminant is less than zero ($-31 < 0$), the equation has no real roots.

Therefore The correct answer is No real roots.

Additional Information

Discriminant and Perfect Squares

If a, b, and c are rational and D is a perfect square, the roots are rational; otherwise, they are irrational.

Nature of Roots Summary

D > 0 → Real and distinct | D = 0 → Real and equal | D < 0 → Imaginary roots.

Quadratic Formula

The roots of $ax^2 + bx + c = 0$ are calculated as $x = (-b \pm \sqrt{D}) / 2a$.

Sum and Product of Roots

Sum of roots $(\alpha + \beta) = -b/a$ and Product of roots $(\alpha\beta) = c/a$.

Q10. Answer: (c) 2

The given series can be represented as:

So, there are 2 symbols: & and # in the series which are between the seventh element from the right end and the fifth element from the left end of the given series.

Hence, the correct answer is '2'.

Q11. Answer: (c) Brahmaputra river

The correct answer is Brahmaputra river.

Key Points

• Majuli in the Brahmaputra river is the largest inhabited riverine island in the world.

• In 2016, it became the first island to be a district in India.

• The island is formed by the Brahmaputra River in the south and the Kherkutia Xuti, an anabranch of the Brahmaputra River, joined by the Subansiri River in the north.

• It was created by changes in the flow of the Brahmaputra River and its tributaries, mostly the Lohit River.

Q12. Answer: (c) x2 - 3x - 6 = 0

Shortcut Trick

Directly expand the quadratic equation using the property $(x + a)(x + b) = x^2 + (a + b)x + ab$.

Here, $a = -4$ and $b = 1$, so the LHS becomes: $x^2 + (-4 + 1)x + (-4 \times 1) = x^2 - 3x - 4$.

Equating to the RHS: $x^2 - 3x - 4 = 2$.

Shift the constant from the RHS to the LHS: $x^2 - 3x - 4 - 2 = 0$.

Therefore The correct answer is $x^2 - 3x - 6 = 0$.

Alternate Method

Given: $(x - 4)(x + 1) = 2$

Method: Use the distributive property to expand the binomials and write in the standard form $ax^2 + bx + c = 0$.

$\Rightarrow x(x + 1) - 4(x + 1) = 2$

$\Rightarrow x^2 + x - 4x - 4 = 2$

$\Rightarrow x^2 - 3x - 4 = 2$

$\Rightarrow x^2 - 3x - 4 - 2 = 0$

$\Rightarrow x^2 - 3x - 6 = 0$

Therefore The correct answer is $x^2 - 3x - 6 = 0$.

Additional Information

Standard Form of Quadratic Equation

The standard representation of any quadratic equation is given by $ax^2 + bx + c = 0$, where a, b, and c are constants and $a \neq 0$.

Nature of Roots

The nature of the roots can be determined by the discriminant (D), calculated as $D = b^2 - 4ac$.

Quadratic Formula

To find the roots of the equation $ax^2 + bx + c = 0$, use the formula $x = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$.

Q13. Answer: (b) 23

The logic followed here is:

Hence, '23' will replace the question mark (?) in the given series.

Q14. Answer: (a) The virus can be transmitted by shaking hands with a person infected with HIV.

The correct answer is 'The virus can be transmitted by shaking hands with a person infected with HIV.'

Key Points

• AIDS virus (HIV Virus) is spread through body fluids such as blood, semen, rectum fluids, vaginal fluids and breast milk.

• The virus can be transmitted when these fluids in an infected person come into contact with mucous membranes in the rectum, vagina, penis, or mouth of another person.

• It cannot spread through touch, food, saliva, mosquitos and water.

• Thus, a person cannot get infected by shaking hands with a person infected with HIV.

Additional Information

• Various modes of transmission of HIV virus are:

• By sharing the syringes used for injecting drugs.

• Through sexual contact with an infected person.

• Through breast milk to an infant.

Q15. Answer: (b) Dilip

Given:

Anu, Dilip, Eshwar, Jahanvi, Komal, Pallavi, Riya, and Tara are sitting around a square table facing the centre of the table.

Some of them are sitting at the corners, while some are sitting at the exact centre of the sides.

According to the given information,

(1.) Tara is to the immediate right of Komal and to the immediate left of Jahanvi.

(2.) Eshwar is sitting at the exact centre of one of the sides and has Riya to the immediate left and Komal to the immediate right.

• Eshwar has Riya to the immediate left and Komal to the immediate right.

(3.) Anu is to the immediate left of Riya.

(4.) Dilip and Jahanvi have only one person between them.

Hence, 'Dilip' is sitting to the immediate right of Pallavi.

YourMockTest.com — Free Study Material

Q16. Answer: (c) 15

The correct answer is '15'.

Key Points

• Non-metallic elements are the elements with high ionization energies, high electronegativity and small size.

• They gain electrons on reaction with other compounds forming covalent bonds.

• Owing to all these properties, non-metals are placed in Group- 14,15,16 and 17.

• But in group 14 there is only one non-metal present which is Carbon.

Additional Information

• No. of non-metals in group 15 - Two

• No. of non-metals in group 16 - Three

• No. of non-metals in group 17 - Four

Q17. Answer: (a) Iris

The correct answer is 'Iris'.

Key Points

• Iris is responsible for giving colors to the eyes.

• If there is less melanin in the iris, light can pass through and is reflected by collagen fibres that are located deeper in the eye. The colour of the eyes becomes bluer when light is reflected back.

• The color can range from light blue to dark brown, depending on the degree of pigmentation.

Additional Information

• Iris is also responsible for the constriction and enlargement of pupil which decides how much light will pass through it.

• Functions of other parts of eyes:

• Lens: Transparent biconvex surface which refracts light focusing it onto the retina.

• Retina: It receives the light which lens has focused, convert the light into neural signals and send these signals to the brain.

• Cornea: It controls and focuses the entry of light into the eyes.

Q18. Answer: (a) Anant

According to the given information, we have the possible arrangements as follows:

1). Anant is taller than Gagan → Anant > Gagan

2). Manoj is shorter than Janak → Janak > Manoj

3). Parth is taller than Janak but shorter than Gagan → Parth > Janak < Gagan

4). If Anurag is the shortest, then the Final arrangement should be like → Anant > Gagan > Parth > Janak > Manoj > Anurag

Hence, "Anant" is the tallest among them.

Q19. Answer: (a) 25 : 36

Shortcut Trick

For similar triangles, the ratio of their areas is equal to the square of the ratio of their corresponding sides.

Ratio of sides = 5 : 6

Ratio of areas = $5^2 : 6^2 = 25 : 36$

Therefore The correct answer is 25 : 36.

Alternate Method

Given:

Ratio of corresponding sides (s1 : s2) = 5 : 6

Formula Used:

$Area(\Delta 1) / Area(\Delta 2) = (s1 / s2)^2$

Calculations:

=> Let the sides be 5k and 6k.

=> Area Ratio = $(5k / 6k)^2$

=> Area Ratio = $25k^2 / 36k^2$

=> Area Ratio = 25 : 36

Therefore The correct answer is 25 : 36.

Additional Information

Area of Similar Triangles Theorem

If two triangles are similar, the ratio of their areas is equal to the square of the ratio of their corresponding altitudes, medians, or angle bisectors.

Perimeter Ratio

The ratio of the perimeters of two similar triangles is equal to the ratio of their corresponding sides (P1/P2 = s1/s2).

Similarity Criteria

Triangles are similar if they satisfy AA (Angle-Angle), SAS (Side-Angle-Side), or SSS (Side-Side-Side) conditions.

Q20. Answer: (d) 1 cm

Shortcut Trick

Since the Curved Surface Area (CSA) remains constant, the product of radius (r) and height (h) must be constant (r1h1 = r2h2).

Given: r1 = 4 cm, h1 = 4 cm, r2 = 16 cm.

4 × 4 = 16 × h2

h2 = 16 ÷ 16 = 1 cm.

Therefore The correct answer is 1 cm.

Alternate Method

Given: Initial radius (r1) = 4 cm, Final radius (r2) = 16 cm, Initial height (h1) = 4 cm.

Formula Used: Curved Surface Area of Cylinder = 2πrh

=> According to question: CSA_(initial) = CSA_(final)

=> 2 × π × r1 × h1 = 2 × π × r2 × h2

=> r1 × h1 = r2 × h2

=> 4 × 4 = 16 × h2

=> 16 = 16 × h2

=> h2 = 1 cm

Therefore The correct answer is 1 cm.

Additional Information

Total Surface Area of Cylinder

The total area including bases is given by TSA = 2πr(h + r).

Volume of Cylinder

The space occupied by a cylinder is V = πr²h.

Inverse Relationship

For a constant area, if the radius is multiplied by n, the height must be divided by n.

Q21. Answer: (d) Cuboidal epithelium

The correct answer is Cuboidal epithelium.

Key Points

• Cuboidal epithelium forms the lining of kidney tubules and duets of salivary glands.
• It provides mechanical support to the tubules and the glands.
• Cuboidal epithelium is cubical or more or less squarish in shape.
• The Nucleus of the cells lies in the centre.

Additional Information

• Locations of all other epithelium are as follows:
• Squamous epithelium: Is present in walls of capillaries, air sacs, alveoli, lungs, and the kidney.
• Columnar epithelium: Lines the surface of the cervix and endocervical crypts which helps in absorption and secretion.
• Glandular epithelium: Forms covering all the major glands.

Q22. Answer: (a) 7^(th) century

The correct answer is 7^(th)century.

Key Points

• Islam is, major world religion promulgated by the Prophet Muhammad in Arabia in the 7th century CE.
• Islam Muhammad is considered the last of a series of prophets.
• Islam teaches that the creation of everything in the universe was brought into being by God's command.
• Adherents of Islam, called Muslims, number approximately 1.8 billion globally and are the world's second-largest religious

population behind Christians.

Q23. Answer: (c) Squash

The correct answer is Squash.

Key Points

• Dipika Pallikal won the women's doubles and mixed doubles titles with Joshna Chinappa and Saurav Ghosal, respectively at the World Doubles Squash Championships in Glasgow on 9 April 2022.

• Dipika Pallikal and Saurav Ghosal defeated England's Adrian Waller and Alison Waters 11-6, 11-8 in the final at the Scotstoun Leisure Centre.

• They became India's first-ever World Doubles squash champions.

Additional Information

• Anahat Singh has become the first Indian girl to win the U-15 girls category of the Junior US Open Squash tournament in Philadelphia.

• Saurav Ghosal has become the first Indian squash player to win the Malaysian Open Championships in November 2021.

Q24. Answer: (d) Both conclusions I and III follow.

Statements:

All anklets are printers.

Some printers are birds.

Some birds are cherries.

The least possible Venn diagram for the given statements is as follows:

Conclusions:

I. Some birds are printers => True (As Some printers are birds so, from the above Venn diagram we can conclude that some birds are printers.)

II. All printers are anklets.=> False (As all anklets are printers but vice-versa is not true in a definite sense.)

III. Some cherries are birds =>True (As Some birds are cherries so, from the above Venn diagram we can conclude that Some cherries are birds.)

Hence, "Both conclusions I and III follow".

Q25. Answer: (c) 48

Shortcut Trick

Identify the multiplication factor between the first term and the third term.

Since 10 × 3 = 30, apply the same factor to the second term to find y.

=> y = 16 × 3 = 48.

Therefore The correct answer is 48.

Alternate Method

Given:

The ratio is 10 : 16 :: 30 : y.

Formula Used:

In a proportion a : b :: c : d, the Product of Extremes = Product of Means.

=> a × d = b × c

Calculations:

=> 10 × y = 16 × 30

=> 10y = 480

=> y = 480 ÷ 10

=> y = 48

Therefore The correct answer is 48.

Additional Information

Direct Proportion

Two quantities are in direct proportion if an increase in one leads to a proportional increase in the other, represented as a/b = c/d.

Fourth Proportional

In the expression a : b :: c : d, 'd' is known as the fourth proportional to a, b, and c.

Mean Proportional

The mean proportional between two numbers a and b is given by √(a × b).

Q26. Answer: (c) Neither conclusion I nor II is true

Statement:

E < T = D ≤ Q > Z = G

Conclusions:

I. T < G => False (Since Q > G and T ≤ Q but there is no direct relationship between G and T.)

II. Z > D => False (Since D ≤ Q and Q > Z but there is no direct relationship between Z and D.)

Hence, "Neither conclusion I nor II is true".

Q27. Answer: (d) Jammu And Kashmir

The correct answer is Jammu and Kashmir.

Key Points

• The Jammu and Kashmir Police recently started Two women's safety squads in Srinagar city.

• Each squad will comprise 5 Lady Police officers or personnel.

• Both squads will be headed by Inspector Khalida Parveen.

Additional Information

• The women's safety squad was started to help women in distress.

• Its main purpose is to ensure the security of girls, especially across schools, colleges, universities, coaching centres, and other such places.

• They would be patrolling all across the city including educational institutions, during the day.

• Heads of the Institutions have also been asked to contact the women's squad in case, any incident takes place outside their centres.

Q28. Answer: (b) None

Given word: BOARD

After arranging it alphabetically it follows:

B changes to 2nd position.

O changes to 4th position.

A changes to 1st position.

R changes to 5th position.

D changes to 3rd position.

Hence, "None" of the letters will remain unchanged.

Q29. Answer: (d) 170 km

Shortcut Trick

Train from Amritsar starts 40 mins earlier (3:20 p.m. to 4:00 p.m.).

Distance covered by Amritsar train in 40 mins = 80 × (40/60) = 53.33 km.

Remaining distance at 4 p.m. = 450 − 53.33 = 396.67 km.

Time to meet = 396.67 ÷ (60 + 80) = 396.67 ÷ 140 ≈ 2.833 hours.

Distance from Delhi = Speed of Delhi train × Time = 60 × (396.67/140) = 170 km.

Therefore The correct answer is 170 km.

Alternate Method

Given: Total distance = 450 km. Speed (Delhi) = 60 km/h. Speed (Amritsar) = 80 km/h. Start times = 4 p.m. and 3:20 p.m.

Formula Used: Distance = Speed × Time; Relative Speed = S1 + S2 (Opposite direction)

=> Let meeting time be t hours after 4:00 p.m.

=> Train from Amritsar travels for (t + 40/60) hours = (t + 2/3) hours.

=> Distance (Delhi) + Distance (Amritsar) = 450

=> 60 × t + 80 × (t + 2/3) = 450

=> 60t + 80t + 160/3 = 450

=> 140t = 450 − 53.33

=> 140t = 396.67

=> t = 396.67 ÷ 140 = 2.833 hours

=> Meeting distance from Delhi = 60 × 2.833 = 170 km.

Therefore The correct answer is 170 km.

YourMockTest.com — Free Study Material

Additional Information

Relative Speed

When two objects move in opposite directions, their relative speed is the sum of their individual speeds (S1 + S2).

Time Adjustment

Always calculate the distance covered by the early-starting object before applying the relative speed formula to the remaining distance.

Meeting Point Distance

Distance from a station = Speed of the train starting from that station × Time it traveled until the meeting point.

Q30. Answer: (d) 9

The logic followed here is:

√(First Number) - 1 = Second Number

Considering each analogy pair:

25 : 4 :: 49 : 6 :: 9 : 2 :: 100 :?

√25 - 1 = 4

5 -1 = 4

4 = 4

25 : 4 :: 49 : 6 :: 9 : 2 :: 100 :?

√49 - 1 = 6

7 - 1 = 6

6 = 6

25 : 4 :: 49 : 6 :: 9 : 2 :: 100 :?

√9 - 1 = 2

3 - 1 = 2

2 = 2

25 : 4 :: 49 : 6 :: 9 : 2 :: 100 :?

√100 - 1 = ?

10 - 1 = ?

9 = ?

Thus, in this analogy series question mark (?) is replaced by '9'.

Hence, the next number in the series is 9.

Q31. Answer: (d) 40 W, 10 Ω

Given:

Four identical bulbs are connected parallelly.

The voltage of the battery = 10 V

Current = 4 A

Formula used:

Power = V × I

From Ohm's Law, V = I × R

Effective resistance in parallel, 1/(R_(eq)) = 1/R1 +1/R2+ 1/R3 +1/R4

Calculation:

V = I × R_(eq); R_(eq)= 10/4

Resistance in each bulb(R),

1/(R_(eq)) = 1/R1 +1/R2+ 1/R3 +1/R4 ; =1/R +1/R+ 1/R +1/R ; =4/R; R_(eq)= R/4; R = 10/4 × 4; R=10 Ω

Thus, resistance in each bulb is 10 Ω.

Current in each bulb,

I = V/R ; I=10/10; I=1 A

Power dissipated in the circuit,

P=V × I; =10 × 4 ; =40

YourMockTest.com — Free Study Material

Q32. Answer: (a) 1

Shortcut Trick

The standard empirical relationship for a moderately skewed distribution is Mode = 3 Median − 2 Mean.

To match the given options, subtract Median from both sides of the formula:

Mode − Median = 3 Median − 2 Mean − Median

Mode − Median = 2 Median − 2 Mean => Mode − Median = 2 (Median − Mean).

Therefore The correct answer is Mode − Median = 2 (Median − Mean).

Alternate Method

Given: Statistical expressions involving Mean, Median, and Mode.

Formula Used: Empirical Relationship: Mode = 3 Median − 2 Mean.

We test each expression for consistency with the empirical formula:

=> Let the formula be Mode = 3 Median − 2 Mean.

=> Rearranging the terms: Mode − Median = 3 Median − Median − 2 Mean.

=> Mode − Median = 2 Median − 2 Mean.

=> Mode − Median = 2 (Median − Mean).

=> This perfectly matches Expression 1.

Checking other options:

=> Expression 3: Mode = 2 Median − Mean (Incorrect, factor should be 3 and 2).

=> Expression 4: 2 Mean = 2 Median − Mode => Mode = 2 Median − 2 Mean (Incorrect).

Therefore The correct answer is Mode − Median = 2 (Median − Mean).

Additional Information

Empirical Relationship

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

Symmetric Distribution

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

Skewness Property

In a positively skewed distribution, Mean > Median > Mode, while in negatively skewed, Mean < Median < Mode.

Q33. Answer: (d) 12

Given:

11 - {7 - 56 ÷ (2 × 3 + 1)}

Concept used:

BODMAS rule.

Calculation:

According to the BODMAS rule, we will solve the expression.

11 - {7 - 56 ÷ (2 × 3 + 1)}

= 11 - {7 - 56 ÷ (6 + 1)}

= 11 - {7 - 56 ÷ 7}

= 11 - {7 - 8}

= 11 - {- 1}

= 11 + 1

= 12

Hence, the correct answer is 12.

Q34. Answer: (d) 6

According to the given Venn diagram:

The total number of men is 11

Those who are both photographers and men are 5.

Those who are both men and musician is 1.

So, shading the portion of men by ignoring photographers and musicians as shown below,

From the above-shaded portion of the Venn diagram, we can conclude that,

Those who are NEITHER photographers NOR musicians are 6.

Hence, the correct answer is "6".

Q35. Answer: (c) 59, 97

Shortcut Trick

Identify the pair where both numbers are prime or have no common factor other than 1.

51 & 119 → both divisible by 17.

65 & 91 → both divisible by 13.

59 & 97 → both are prime numbers, so their HCF is 1.

133 & 171 → both divisible by 19.

Therefore The correct answer is 59, 97.

Alternate Method

Given: Pairs of numbers (51, 119), (65, 91), (59, 97), (133, 171).

Formula Used: Two numbers are co-prime if their Highest Common Factor (HCF) is 1.

=> Case 1: 51 = 3 × 17 and 119 = 7 × 17. HCF = 17.

=> Case 2: 65 = 5 × 13 and 91 = 7 × 13. HCF = 13.

=> Case 3: 59 and 97 are both prime numbers. HCF = 1.

=> Case 4: 133 = 7 × 19 and 171 = 9 × 19. HCF = 19.

Therefore The correct answer is 59, 97.

Additional Information

Definition of Co-prime Numbers

Two numbers are said to be co-prime if their only common factor is 1. They do not need to be prime themselves.

Properties of Prime Numbers

Any two distinct prime numbers are always co-prime to each other because they have no factors other than 1 and themselves.

Consecutive Numbers

Any two consecutive natural numbers (e.g., 14, 15) are always co-prime as their HCF is always 1.

Q36. Answer: (c) Dr. Rajendra Prasad

The correct answer is Rajendra Prasad.

Key Points

• The Constituent Assembly was formed for the creation of the Indian Constitution.

• The Constituent Assembly was formed in July 1946 based on the recommendations of the Cabinet Mission.

• As a prominent leader of congress, Dr. Rajendra Prasad worked with Mahatma Gandhi and other leaders.

• Dr. Rajendra Prasad was elected as the President of the Constituent Assembly.

• Dr. Rajendra Prasad worked as the longest-serving President of India (1950 to 1962).

• Rajendra Prasad was elected as the first President of India on 24th January 1950 and the vice-president was Harendra Coomar Mookerjee.

• He was one of the prominent leaders of the Indian independence movement and played a prominent role as the President of the Indian National Congress.

Additional Information

• B. R. Ambedkar was an Indian polytheist, economist, politician, and social reformer.

• After the independence of India, he became the first Law and Justice Minister of independent India.

• He was the father of the Indian Constitution and one of the architects of the Republic of India.

• He was the chairman of the Drafting Committee.

• Lal Bahadur Shastri was born on 2nd October in 1904 at Mughalsarai, Uttar Pradesh in a simple family.

• His father name was Mr. Sharada Prasad and his mother name was Mrs. Ramdulari Devi. His father died when he was only a year old.

• He got his education from the East Central Railway Inter College in the Mughalsarai, Varanasi.

• He had joined the non-cooperation movement against British Government in 1921 by Mahatma Gandhi when he was only seventeen years old.

• He had completed his graduation from the Kashi Vidyapeeth, Varanasi in the year 1926 and was awarded the title of Shastri.

• On 11 January 1966, he died in Tashkent, USSR (now Uzbekistan) after signing the Tashkent Declaration with Pakistani President Ayub Khan.

• Jawaharlal Nehru was born on 14 November 1889 in Allahabad.

YourMockTest.com – Free Study Material

• In 1912, he participated in the Bankipur Conference as a delegate.
• In 1919, he became the Secretary of the Home Rule League of Allahabad.
• In 1916, he met Mahatma Gandhi for the first time, from whom he was greatly inspired.
• He is the first prime minister of India.

Q37. Answer: (a) 145

The pattern followed here is:

Hence, "145" will replace the question mark (?) in the given series.

Q38. Answer: (a) Servants of the People Society

The correct answer is Servants of the People Society.

Key Points

• Lala Lajpat Rai, one of the most prominent leaders of the Indian independence movement, was associated with the Servants of the People Society (Lok Sevak Mandal) since 1921.
• He founded the Servants of the People Society, a non-profit welfare organization, in Lahore in 1921.
• The society was established with the objective of serving the society in a non-political, non-sectarian manner, with its primary focus being education.
• Even after his death, the Servants of the People Society continued to function, with branches in several parts of India, carrying out charitable and social service activities.

Additional Information

Name of the organization	Place	Founder	Year
Brahmo Samaj	Kolkata	Raja Rammohan Roy	1828
Servants of the People Society	Lahore	Lala Lajpat Rai	1921
Swaraj party	•	Motilal Nehru CR Das	1923
Deccan Education Society	Pune	Bal Gangadhar Tilak	1884

Q39. Answer: (b) Lead iodide

The correct answer is Lead iodide.

Key Points

• When lead nitrate solution is mixed with sodium iodide solution, a yellow precipitate is formed along with potassium nitrate.
• The yellow precipitate formed is lead iodide (PbI2).
• The balanced chemical equation of this reaction is:
• $(PbNO3)2(aq) + 2NaI(aq) \rightarrow PbI2(s) + 2NaNO3(aq)$

Additional Information

• Sodium nitrite:
• Sodium nitrite is an inorganic compound with the chemical formula NaNO2.
• One of two processes - the oxidation of lower nitrogen oxides or the reduction of nitrate salts is used in the industrial manufacturing of sodium nitrite.
• Lead nitrite:
• Lead nitrite is an inorganic compound with the chemical formula Pb(NO3)2.
• Lead nitrate is produced by reaction of lead(II) oxide with concentrated nitric acid:
• $PbO + 2\ HNO3(concentrated) \rightarrow Pb(NO3)2\downarrow + H2O$
• Sodium nitrate:
• Sodium nitrate is an inorganic compound with the chemical formula NaNO3.
• Some methods of preparation of sodium nitrate are:
• $NaHCO3 + HNO3 \rightarrow NaNO3 + H2O + CO2$
• $Na2CO3 + 2HNO3 \rightarrow 2NaNO3 + CO2 + H2O$
• $NaOH + HNO3 \rightarrow NaNO3 + H2O$

Q40. Answer: (d) 35

Given:

Position of Rahul from the front end is 21^(st).

Position of Ankit from the rear end is 10^(th).

Number of people between Rahul and Ankit is 4.

Let us draw a diagram, based on the given information,

=> Total number of people in rows = Position of Rahul from front + Position of Ankit from rear end + Number of people between Rahul and Ankit

=> Total number of people in rows = 21 + 10 + 4

=> Total number of people in row = 35

Hence, "35" is the correct answer.

Q41. Answer: (d) Rs. 4,347

Shortcut Trick

Effective rate of Compound Interest for 2 years = x + y + (xy ÷ 100)

Net Interest Rate = 7 + 7 + (7 × 7 ÷ 100) = 14.49%

Compound Interest = 14.49% of Rs. 30,000

CI = 14.49 × 300 = Rs. 4,347

Therefore The correct answer is Rs. 4,347.

Alternate Method

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

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

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

=> $A = 30000 \times (1.07)^2$

=> A = 30000 × 1.1449

=> A = Rs. 34,347

=> CI = 34347 − 30000

=> CI = Rs. 4,347

Therefore The correct answer is Rs. 4,347.

Additional Information

Difference between CI and SI

For 2 years, the difference between Compound Interest and Simple Interest is CI − SI = $P \times (R \div 100)^2$.

Half-Yearly Compounding

If interest is compounded semi-annually, the new Rate = R ÷ 2 and the new Time period = 2 × n.

Rule of 72

To estimate the time required to double an investment with compound interest, divide 72 by the annual interest rate ($T \approx 72 \div R$).

Q42. Answer: (a) 196

The logic followed here is:

$(Number + 2)^2$ = Next number

Considering each pair and applying the logic,

1. 3 : 25

$(3 + 2)^2 = 25$

$5^2 = 25$

25 = 25

2. 8 : 100

$(8 + 2)^2 = 100$

$10^2 = 100$

100 = 100

3. 12 : ?

$(12 + 2)^2$

$=> 14^2$

=> 196

Therefore, the question mark (?) will be replaced by 196.

Hence, the correct answer is "196".

Q43. Answer: (b) 4

Given number:

5613743658

Given Condition:

• One is added to each odd digit.

• Two is subtracted from each even digit.

Now, the number becomes 6424824466

Now, the 2nd digit from the left is 4

Hence, the correct option is "4".

Q44. Answer: (c) Rs. 18, 100 crore

The correct answer is "Rs. 18,100 crore".

Key Points

• The Government of India has allocated 18,100 crore to the Production Linked Incentive (PLI) Scheme "National Programme on Advanced Chemistry Cell (ACC) Battery Storage" with the goal of producing fifty (50) Gigawatt hours (GWh) of ACC to boost the country's industrial capability.

• The initiative's goals include increasing value added at home and making Indian battery production more competitive on a global scale by reducing the levelized cost of production.

• The program is made to not care about the specifics of the battery technology being used, but rather the result that is being sought.

Additional Information

• Production Linked Incentive (PLI) scheme

• To boost domestic manufacturing and cut down on import bills, the union government in March 2020 introduced a PLI scheme that aims to give companies incentives on incremental sales from products manufactured in domestic units.

• The major aim of the scheme was to invite foreign investors to set up their manufacturing units in India.

• Similarly, the PLI scheme aims to promote local manufacturers to expand their manufacturing.

• Under the Scheme, companies will get incentives on incremental sales from products manufactured in domestic units.

• The scheme is implemented by the concerned ministries/departments.

• Apart from inviting foreign companies to set shop in India, the scheme also aims to encourage local companies to set up or expand existing manufacturing units.

• The Scheme has also been approved for sectors such as automobiles, pharmaceuticals, IT hardware including laptops, mobile phones & telecom equipment, white goods, chemical cells, food processing, etc.

• It will expand the present output and will further augur the achievements. For example, Textile Industry in India is one of the largest in the world and this scheme will contribute to further growth of this sector.

• PLI Scheme will provide low-cost indigenous raw materials for schemes like Smart City, Digital India mission.

• It will give a shot in the arm for the local manufacturing units of our country.

• It will create skilled manpower for the masses and reduce the unemployment ratio as these manufacturing sectors are labor-intensive.

Q45. Answer: (b) 3.6 × 10^6

The correct answer is '3.6 × 106'.

Key Points

• The commercial unit of energy is Kilowatt-hour (kWh).

• 1 kWh equals to 3.6 × 106 joules of energy.

• 1 kWh is the amount of energy consumed by an electrical appliance working at a steady rate of one kilowatt for one hour.

• 1kWh = 1000 Watt-hour = 1000 W × (60 × 60 seconds)=1000× 3600 J = 3.6 ×10^6 J.

Q46. Answer: (a) 17^(th)

The correct answer is " 17^(th)".

Key Points

• In 2019, Indians went to the polls to elect a new parliament, the 17th Lok Sabha.

• The Election Commission of India held elections in seven phases across the country beginning on 11 April 2019 and ending on 19 May 2019.

• One-fourth of the members of the current Lok Sabha are women.

• There are 267 first-time representatives. There are 233 people in this group who have criminal charges pending against them.

• It's estimated that 39% of members are also active in politics or social work in their professional lives.

Additional Information

• In India's general election of 2014, representatives were chosen to fill the 16th Lok Parliament. The Electoral Commission of India held the polls in a series of nine stages, beginning on April 7 and ending on May 12.

• At the general election that took place in India in 2009, members of the 15th Lok Sabha were chosen to serve the country. Dissolved by President Pranab Mukherjee on May 18, 2014

Q47. Answer: (a) parallel to the axis of the solenoid

The correct answer is parallel to the axis of the solenoid.

Key Points

• Magnetic field lines in the solenoid follow a longitudinal path, i.e., parallel to its own axis.

• The longitudinal path is the result of the formation of the loop from the lines.

• The magnitude of the magnetic field inside the solenoid is uniform and is independent of length and cross-sectional area.

• The direction of the magnetic field can be known using your right hand:

• If you wrap your fingers in the direction of current, the direction in which your thumb points is the direction of the magnetic field.

Q48. Answer: (a) Four

The correct answer is Four.

Key Points

• Amrit Kaal is a term describing a critical time slot available to all for achieving the highest human potential.

• Amrit kaal was the term used by the union finance minister Nirmala Sitharaman in the budget speech for 2022-2023.

• Amrit kaal have four priorities:-

• PM GatiShakti, Inclusive Development

• Productivity Enhancement & Investment,

• Sunrise Opportunities

• Energy Transition, and Climate Action, and Financing of Investments.

Q49. Answer: (d) 65

Shortcut Trick

Check the given options directly to save time. The options represent the larger number.

If the larger number is 65 (Option 4), the smaller consecutive number must be 64.

One-fourth of the smaller number = 64 ÷ 4 = 16.

One-fifth of the larger number = 65 ÷ 5 = 13.

Difference = 16 − 13 = 3, which completely satisfies the given condition.

Therefore The correct answer is 65.

Alternate Method

Given:

Two consecutive numbers are given.

One-fourth of the smaller number exceeds one-fifth of the larger number by 3.

Calculations:

Let the smaller number be x and the larger consecutive number be (x + 1).

According to the given condition:

=> x/4 − (x + 1)/5 = 3

Taking the LCM of the denominators (4 and 5), which is 20:

=> (5x − 4(x + 1)) / 20 = 3

=> 5x − 4x − 4 = 60

=> x − 4 = 60

=> x = 60 + 4

=> x = 64

The smaller number is 64.

The larger number = x + 1

=> 64 + 1 = 65

Therefore The correct answer is 65.

Additional Information

Consecutive Numbers

Numbers that follow each other continuously in order from smallest to largest are called consecutive numbers. If the first number is n, the next consecutive numbers are n+1, n+2, etc.

Consecutive Even/Odd Numbers

For purely even or purely odd numbers, the difference between any two consecutive terms is always 2. Example: x, x+2, x+4.

Solving Linear Equations with Fractions

When solving equations involving fractions, multiplying the entire equation by the Least Common Multiple (LCM) of all denominators helps eliminate the fractions and simplifies calculation instantly.

Q50. Answer: (c) One

Given word: SHIRT

Arranging the given word alphabetically:

This shows that only one position of one alphabet "T" does not change its position.

Hence, "One" is the correct answer.

Q51. Answer: (b) Sodium

The correct answer is Sodium.

Key Points

• Metals consist of alkali metals, alkali earth metals, transition metals, lanthanides and actinoids.
• Metals have high reactivity with water and oxygen.
• Metal is utilised to construct a variety of objects since it is strong and long-lasting.
• They are employed in the production of vehicles, satellites, kitchenware, etc.
• Metals are usually hard. Yet, some metals are not hard.
• While mercury is a liquid metal at ambient temperature, sodium and potassium are such metals that can be cut with a knife.
• Sodium is an alkali metal which belong to Group 1.

Additional Information

• Germanium:
• Germanium is a metalloid.
• Metalloids have intermediate properties those within metals and non-metals.
• Metalloid are used in optoelectronics, pyrotechnics, semiconductors and electronics.
• Bromine and Neon:
• Bromium and Neon are non-metals.
• The elements that accept or gain electrons to generate negative ions are known as non-metals.
• In their outermost shell, non-metals often have 4, 5, 6 or 7 electrons.

Q52. Answer: (a) CPN : NKC

Alphabets and their positional values:

The logic followed here is:

The middle alphabet has been replaced with the opposite positional alphabet, and either side of the alphabet are exchanged.

NZF : FAN

And,

HSE : EHH

Similarly,

CPN : NKC

Hence, the pair of letter-cluster from among the options that follow the same logic is "CPN : NKC".

YourMockTest.com – Free Study Material

Q53. Answer: (b) 72°

Shortcut Trick

Ratio of adjacent angles = 2 : 3

Sum of ratio parts = 2 + 3 = 5 units

Sum of adjacent angles in a parallelogram = 180°

5 units = 180° => 1 unit = 36°

Smaller angle = 2 units = 2 × 36° = 72°

Therefore The correct answer is 72°.

Alternate Method

Given:

Ratio of adjacent angles = 2/3

Sum of adjacent angles = 180°

Formula Used:

In a parallelogram, the sum of any two adjacent angles is supplementary (180°).

Calculations:

Let the larger angle be x.

Then, the smaller angle = (2/3)x

=> x + (2/3)x = 180°

=> (3x + 2x) / 3 = 180°

=> 5x / 3 = 180°

=> 5x = 540°

=> x = 108°

=> Smaller angle = (2/3) × 108° = 72°

Therefore The correct answer is 72°.

Additional Information

Q54. Answer: (c) Divija

Given:

• The names of six graduate students are:

• Anudeep

• Yamuna

• Chinmayi

• Divija

• Esha

• Guna

• There are 7 days in a week.

• None of them have the exam before Chinmayi and after Yamuna

• Esha has exam on Tuesday and immediately before Anudeep.

• Guna has the exam immediately after Anudeep and immediately before Divija.

From the above arrangement, Divija will be having an exam on Friday.

Hence, the correct answer is Divija.

Q55. Answer: (b) Nilgiri Hills

The correct answer is " Nilgiri Hills ".

Key Points

• At 2,623 mts above MSL, Doddabetta is the highest Peak in Tamil Nadu and is about 10 km from Ooty bus stand.

• The name Doddabetta literally means ‘Big mountain’ in the Badugu Language, which is so in reality.

• It is at the junction of the Western and Eastern Ghats and offers beautiful vistas of the Nilgiri Hills range.

• It is surrounded by dense Sholas.

• The peaks Hecuba (2375 m), Kattadadu (2418 m) and Kulkudi (2439 m) are the three closely linked summits in the west of the Doddabetta range near to Udagamandalam

YourMockTest.com — Free Study Material

Additional Information

• Ananthagiri Hills is located in Vikarabad district, Telangana, India. The water flows from these hills to Osman Sagar, also known as Gandipet lake, and Himayathsagar.

• The Cardamom Hills or Yela Mala are a mountain range of southern India and part of the southern Western Ghats located in the Idukki district, Kerala, India.

• The Servarayan hills, with the anglicised name Shevaroy Hills, are a towering mountain range (1620 m) near the city of Salem, in Tamil Nadu state, southern India.

Q56. Answer: (a) A residual amount of air remains in the lungs

The correct answer is A residual amount of air remains in the lungs.

Key Points

• The process of exhaling carbon dioxide from the body is known as expiration.

• Expiration happens when the air pressure outside increases.

• During expiration, the external intercostal muscles relax and the internal intercostal muscles contract.

• The size of the thoracic cavity decreases, this relaxes the diaphragm, and the lungs get compressed.

• Also, a residual amount of air remains in the lungs which is known as residual volume.

Q57. Answer: (b) Only conclusion III follows.

Statements:

All sachets are bags.

Some bags are clocks.

No clock is a toaster.

Venn Diagram:

Conclusion I: Some toasters are clocks. → False (As no clock is a toaster so some toasters are clocks is not possible .)

Conclusion II: No sachet is a toaster → False (As there is no direct relationship between 'sachet' and 'toaster', so we cannot conclude anything about their relation.)

Conclusion III: Some bags are Sachets. → True (This is the correct conclusion because all sachets are bags. So some bags are sachets is a definite possibility.)

So," only Conclusion III follows."

Q58. Answer: (c) Green plants capture about 10% of the solar energy that falls on leaves.

The correct answer is Green plants capture about 10% of the solar energy that falls on leaves.

Key Points

• Plants absorb only 1-2% of the sunlight that falls on leaves, as 98-99 % of the sunlight is reflected back and converted to heat.

• Energy flow is unidirectional from the lower trophic level to the higher trophic level.

• 10% of energy is absorbed by each trophic level and the rest is lost in the environment.

Q59. Answer: (d) Rs. 8

Shortcut Trick

Cost of pencil = Rs. 1

Cost of pen = 2 × 1 = Rs. 2

Required cost = (3 × 2) + (2 × 1) = 6 + 2 = Rs. 8

Therefore The correct answer is Rs. 8.

Alternate Method

Given:

=> Cost of 1 pencil = Rs. 1

=> Cost of 1 pen = 2 × (Cost of 1 pencil)

Calculations:

=> Cost of 1 pen = 2 × 1 = Rs. 2

=> Cost of 3 pens = 3 × 2 = Rs. 6

=> Cost of 2 pencils = 2 × 1 = Rs. 2

=> Total cost = Cost of 3 pens + Cost of 2 pencils

=> Total cost = 6 + 2 = Rs. 8

Therefore The correct answer is Rs. 8.

Additional Information

Unitary Method

Finding the value of a single unit first and then multiplying by the required number of units to find the total value.

Ratio and Proportion

The relationship between the cost of pen and pencil can be expressed as a ratio of 2 : 1.

Linear Equations

Problems involving multiple items can be solved by forming linear equations like Ax + By = Total Cost.

Q60. Answer: (a) √2 : √3

Shortcut Trick

For any two squares, the ratio of sides is the square root of the ratio of their areas.

Since Perimeter is directly proportional to the Side (P = 4s), the ratio of perimeters is the same as the ratio of sides.

Ratio of Perimeters = √(Ratio of Areas) = √2 : √3

Therefore The correct answer is √2 : √3.

Alternate Method

Given: Ratio of areas of two squares (A1 : A2) = 2 : 3.

Formula Used: Area of square = s^2 | Perimeter of square = 4s

=> Let the sides of the two squares be s1 and s2.

=> Ratio of Areas = $s1^2 / s2^2 = 2 / 3$

=> Taking square root on both sides: s1 / s2 = √2 / √3

=> Perimeter of first square (P1) = 4s1

=> Perimeter of second square (P2) = 4s2

=> Ratio of Perimeters = P1 / P2 = 4s1 / 4s2 = s1 / s2

=> P1 : P2 = √2 : √3

Therefore The correct answer is √2 : √3.

Additional Information

Relationship between Dimensions

For similar figures like squares, the ratio of lengths (sides, diagonals, perimeters) is always the square root of the ratio of their areas.

Diagonal of a Square

The ratio of the diagonals of these two squares would also be the same as the ratio of their sides, which is √2 : √3.

General Scale Factor

If the side ratio is a : b, then the perimeter ratio is a : b and the area ratio is $a^2 : b^2$.

Q61. Answer: (c) 7

Shortcut Trick

Subtract the remainders from the given numbers: (50 − 1), (58 − 2), (69 − 6).

Required number = HCF of 49, 56, and 63.

HCF(49, 56, 63) = 7 (as all are multiples of 7 and no higher common factor exists).

Therefore The correct answer is 7.

Alternate Method

Given: Numbers are 50, 58, 69 and remainders are 1, 2, 6.

Formula Used: Required Number = HCF[(N1 − R1), (N2 − R2), (N3 − R3)]

=> First number: 50 − 1 = 49

=> Second number: 58 − 2 = 56

=> Third number: 69 − 6 = 63

=> Prime factorization of 49 = 7 × 7

=> Prime factorization of 56 = 2 × 2 × 2 × 7

=> Prime factorization of 63 = 3 × 3 × 7

=> Common factor = 7

Therefore The correct answer is 7.

Additional Information

HCF with different remainders

To find the greatest number dividing x, y, and z leaving remainders a, b, and c, calculate HCF(x−a, y−b, z−c).

HCF with same remainder

When the same remainder 'r' is left, the number is HCF(x−r, y−r, z−r). If the remainder is unknown, find HCF(|x−y|, |y−z|, |z−x|).

LCM Application

To find the smallest number divided by x, y, z leaving remainder r in each case, the number is LCM(x, y, z) + r.

Q62. Answer: (d) Sulphur dioxide and sulphur trioxide

The correct answer is Sulphur dioxide and sulphur trioxide.

Key Points

• The chemical formula of ferrous sulphate is FeSO4.
• The strong heating of ferrous sulfate leads to the formation of a brown solid (ferric oxide) and 2 gases.
• This type of reaction is known as decomposition reaction.
• The balanced chemical equation of this reaction is:
• 2 FeSO4 (s) → Fe2O3(s) + SO2 (g) + SO3 (g)

Thus, the two gases formed are Sulphur dioxide (SO2) and Sulphur trioxide (SO3).

Additional Information

• Oxygen:
• Oxygen can be evolved through electrolysis of water, thermal decomposition of various oxides and oxygenic photosynthesis.
• Electrolysis: 2 H2O → 2 H2 + O2
• Disulphur:
• Disulphur is evolved when an atmosphere of COS is irradiated with UV light.
• It can also be produced when S2Cl2, H2S2, CS2, or C2H4S, PSF3 or COS are irradiated.
• Sulphur trioxide:
• Sulphur trioxide is a chemical compound with the formula SO3.
• Sulfur dioxide in air directly oxidizes to Sulphur trioxide extremely slowly:
• SO2 + 1 over 2 O2→ SO3

Q63. Answer: (a) K2CO3

The correct answer is 'K2CO3'.

Key Points

• As the pH of the solution is more than 7, it means that the salt is basic in nature.
• Out of the given salts K2CO3 is basic in nature.
• K2CO3 is an inorganic compound which forms highly alkaline solution.
• It is a salt of strong base (KOH) and weak acid (H2CO3), thus it is slightly basic.
• NH4Cl is an acidic salt while KCl and Na2SO4 are neutral salts.

Additional Information

• Na2SO4:
• Sodium sulphate is a sodium salt of sulphuric acid.
• It is white crystalline and odorless solid.
• It is the reaction product of a strong base and a strong acid.
• Thus, it has a pH of 7, i.e., it is neutral.
• KCl:
• Potassium chloride is a salt containing metal and halogen.
• KCl is also a neutral salt.
• NH4Cl:
• Ammonium chloride is an inorganic compound.
• It is highly soluble in water.
• It has a pH likely between 4.6 - 6.

Q64. Answer: (d) Tamil

The correct answer is: 'Tamil'

Key Points

• Authors of the Sangam canon, The first known written Tamil was called Sangam, variously spelled cankam, chankam, and shangam.

• It is believed that Sangam was written between the 1st and 4th centuries CE in one of three literary schools (chankams) in Madurai, India.

• According to legend, the first Tamil Sangam was presided over by the ancient Tamil leader Siddhar Agastyar and held in Madurai. The Sangam Age describes this time frame.

Additional Information

• Sangam is a term created by later academics.

• There are three Sangams mentioned in Tamil mythology:

• The Madurai

• Kapadapura

• Thenmadurai

• There was a time when the poetry of the Sangam was considered to be that of the nobility. Sangam signifies "association" when taken at face value.

• Sangam literature is the literary term for the works of ancient Tamil authors. This writing system is the oldest example of literature from South India.

Q65. Answer: (b) Equator

The correct answer is: 'Equator'.

Key Points

• Thickness of the troposphere is greatest at the equator because heat is transported to great heights by strong convectional currents.

• The troposphere is thicker at the equator as the equator is warmer.

• The convection currents of air expand the thickness of the troposphere at the poles.

• The simple reason is the thermal expansion of the atmosphere at the equator.

Additional Information

• The rotation of the earth causes centrifugal force which is strongest near the equator and thus pushes the atmosphere to greater heights.

• The thickness of the troposphere also varies with the season.

• The troposphere is thicker in the summer and thinner in winter all around the planet.

Q66. Answer: (c) Executive Officer - Municipal Board

The correct answer is: Executive Officer - Municipal Board.

Key Points

• A functionary is someone who fills a specific role in a political party or some other organization.

• The State Government shall appoint the Chairman of the Board of every municipality mentioned in the first Schedule of the Constitution of municipal board.

• This functionary elected include:

• Chairman- Municipal corporation

• Chairman- District Board

• Chairman- Municipal Board

• All of the above can be appointed by state government but not the executive officer as it is head of organisation so must not functionary elected.

• They are appointed by the state government from the Indian Administrative Service and are responsible for heading the administrative staff of the municipal corporation, implementing the decisions, and preparing its annual budget.

• The 74th Constitutional Amendment Act of 1992 strengthened existing urban local bodies as institutions of self-governance by reorganising them into three categories—Municipal Corporations/Mahanagar Palika, Municipal Councils/Nagar Palika, Nagar Panchayat/Notified Area Council.

• The Act provided for the constitution of such bodies through direct elections of representatives.

YourMockTest.com — Free Study Material

Q67. Answer: (c) 79over 90

Given:

x = 0.877...

Calculation:

We have,

x = 0.877...

Above expression is rewritten as,

x=0.87777777.....

Multiplying both sides with 10

10x=8.777777777..... (1)

Multiplying both sides with 100

100x=87.777777..... (2)

Subtracting equation (2) from (1), we get,

100x-10x=(87.777....)-(8.777.....)

90x=79.00000.....

x=79/90

Hence, the value of 0.877... is 79over90.

Q68. Answer: (a) Rs. 17.70

Given: Rs. 3.50 : Rs. 7.50 :: Rs. 8.26 : x

Concept Used:

According to property of ratio and proportion,

a : b :: c : d

=> largea/b=c/d

Calculation:

=> 3.5 : 7.5 :: 8.26 : x

=> 3.5/7.5=8.26/X

=> X = (8.26 × 7.5)/3.5

=> X = 61.75/3.5 = 17.70

Hence, the value of x is 'Rs. 17.70'.

Q69. Answer: (b) West

Given:

• Pallavi starts walking towards the north and after covering a distance she turns to the right, then again to the right.

• After covering some more distance, she again turns to the right.

Drawing the direction and distance diagram according to the given information,

Hence, now, Pallavi is facing the West direction.

Q70. Answer: (a) +10 D

Given:

u = 20 cm

Formula used:

P=1/(F(in m))

where, P= Power of lens

F= Focal length

Calculation:

In convex lens, when image of equal size is formed the object is placed at a 2F distance (u), which means focal length of the lens is 10 cm.

Thus, power of lens is:

P=1/(F(in m)); =1/(10 cm); =1/(10/100m); =10 D

Hence, the power of the lens is +10D.

YourMockTest.com — Free Study Material

Q71. Answer: (c) Higher education

The correct answer is: 'Higher education'.

Key Points

• e-PGPathshala is an initiative of the MHRD under its National Mission on Education through ICT (NME-ICT) being executed by the UGC.

• It was initiated jointly by the Ministry of Human Resource Development, CIET, and NCERT, and launched in November 2015.

Additional Information

• The content and its quality is being the key component of the education system, high quality, curriculum-based, interactive e-content in 70 subjects across all disciplines of social sciences, arts, fine arts and humanities, natural & mathematical sciences, linguistics, and languages have been developed by the subject experts working in Indian universities and other R & D institutes across the country.

• Every subject has a team of principal investigators, paper coordinators, content writers, content reviewers, Language editors, and multimedia team.

Q72. Answer: (b) They have carbon-carbon single bond only.

The correct answer is They have carbon-carbon single bond only.

Key Points

• A saturated carbon compound is a hydrocarbon in which all of its carbon atoms are bonded to at least 4 other atoms.

• Saturated also implies that the compound shall have no multiple carbon-carbon bonds.

• Saturated carbon compounds are those in which two carbon atoms are only linked together by a single covalent bond, typically in the shape of a ring or chain.

• The general formula of such compounds is: C_nH_(2n + 1)(where, n = number of carbon atoms in the compound).

• Thus, saturated carbon compounds have carbon-carbon single bond only.

• Example:

• Ethane, Propane, Butane, Octane, etc.

• Hydrocarbons with double or triple carbon-carbon bonds are known as unsaturated carbon compounds.

Q73. Answer: (b) 37

Given:

81 ÷ 3 - 14 ÷ 7 × 6 + 6 - 5 = ?

Decoding the information,

Sign	•	•	×	÷
Meaning	÷	×	•	•

We have given expression as,

81 ÷ 3 - 14 ÷ 7 × 6 + 6 - 5

After replacing the signs from left to right and using the BODMAS rule,

= 81 - 3 × 14 - 7 + 6 ÷ 6 × 5

= 81 - 3 × 14 - 7 + 1 × 5

= 81 + 5 - 42 - 7

= 86 - 49

= 37

Hence, “37” is the correct answer.

Q74. Answer: (c) Ionic compounds conduct electricity in molten state but not in solid state.

The correct answer is Ionic compounds conduct electricity in molten state but not in solid state.

Key Points

• Ionic compounds conduct electricity in molten state but not in solid state because in molten state their ions are free to move from place to place.

• ionic compounds cannot conduct electricity in solid state because their ions are fixed together and cannot move.

Additional Information

• Ions of opposite charges are tightly packed together to create crystalline solids known as ionic compounds.

• Ionic compounds often result from reactions between metals and non-metals.

YourMockTest.com — Free Study Material

Q75. Answer: (d) Rs. 50

Shortcut Trick

Subtracting the two equations: (7 Cars + 5 Bikes) − (5 Cars + 3 Bikes) = 600 − 400

=> 2 Cars + 2 Bikes = 200 => 1 Car + 1 Bike = 100

From the second condition: 5 Cars + 3 Bikes = 400

=> 2 Cars + 3(1 Car + 1 Bike) = 400 => 2 Cars + 3(100) = 400

=> 2 Cars = 400 − 300 = 100 => 1 Car = Rs. 50

Therefore The correct answer is Rs. 50.

Alternate Method

Given:

Cost of 7 toy cars and 5 toy bikes = Rs. 600

Cost of 5 toy cars and 3 toy bikes = Rs. 400

Formula Used:

Linear equations in two variables: ax + by = c

Let the cost of one toy car be x and one toy bike be y.

=> 7x + 5y = 600 --- (i)

=> 5x + 3y = 400 --- (ii)

Multiply equation (i) by 3 and equation (ii) by 5 to eliminate y:

=> 3 × (7x + 5y) = 3 × 600 => 21x + 15y = 1800 --- (iii)

=> 5 × (5x + 3y) = 5 × 400 => 25x + 15y = 2000 --- (iv)

Subtracting equation (iii) from equation (iv):

=> (25x − 21x) + (15y − 15y) = 2000 − 1800

=> 4x = 200

=> x = 200 ÷ 4

=> x = 50

Therefore The correct answer is Rs. 50.

Additional Information

Elimination Method

A process of solving a system of equations by multiplying the equations by suitable non-zero constants so that the coefficients of one variable become equal, then adding or subtracting to eliminate that variable.

Substitution Method

Expressing one variable in terms of the other from one equation (e.g., y = (400 − 5x) ÷ 3) and substituting it into the second equation.

Linear Equation Consistency

A system of two linear equations has a unique solution if the ratio of the coefficients of x is not equal to the ratio of the coefficients of y (a1/a2 ≠ b1/b2).

Q76. Answer: (b) It is a medium of exchange

The correct answer is: It is a medium of exchange.

Key Points

• Money is a medium of transaction that is recognised internationally.

• A medium of exchange and a standard of worth, money is essential.

• Prices and values are communicated through this medium.

• It serves as the primary unit of account and medium of exchange, and it moves freely between individuals and nations.

Additional Information

• In the seventh century, small metal pieces used as currency were introduced.

• About 2,700 years ago, in what is now Turkey, the first gold, silver, and bronze coins were made.

• Banknotes are the building blocks of paper currency, and the value of each note is printed right on the note itself. Almost a millennium ago, it was initially developed in China.

Q77. Answer: (d) centre of curvature and pole

The correct answer is centre of curvature and pole.

Key Points

• A spherical mirror's radius of curvature is equal to the radius of the circle it is a part of.
• It can alternatively be described as the separation between the mirror's pole and its centre of curvature on the primary axis.
• The radius of curvature is factor of the mirror's curvature.
• A spherical mirror will be more curved than one with a wider radius of curvature if the former is smaller.

Additional Information

• The focal length of the mirror is defined as the distance from the pole to the primary focus.
• The radius of curvature of the lens is the separation between the primary focus and the centre of curvature

Q78. Answer: (c) f = √xy

Given:

u = -(f+x)

v = -(f+y) (since concave mirror)

Formula used:

Mirror formula: 1/f = 1/u+1/v

Calculation:

1/f=1/u+1/v ; 1/(-f)=1/(-(f+x))+1/(-(f+y)) ; 1/f=1/(f+x)+1/(f+y) ; 1/f=(f+y)+(f+x)/(f+x)(f+y) ; (f+x)(f+y)=f(2 f+y+x) ; f²+(x+y) f+x y=2 f²+(x+y) f ; f²+x y=2 f²; x y=f² ; f=√(x y)

Therefore, the focal length f can be expressed as: f = √xy.

Q79. Answer: (b) CED 28

The pattern followed here is:

Hence, 'CED 28' can replace the question mark in the series.

Q80. Answer: (d) Carbon-carbon bond is stronger than Si-Si bond due to the smaller size of carbon as compared to silicon.

The correct answer is Carbon-carbon bond is stronger than Si-Si bond due to the smaller size of carbon as compared to silicon.

Key Points

• Carbon exhibits catenation much more than silicon because of its smaller size.
• This makes C-C bond strong while the Si-Si bond are comparatively weaker due to its large size.

Additional Information

• Catenation is the self-linking of atoms of an element to create chains and rings.
• Carbon is the most common element that exhibits catenation. It can form long hydrocarbon chains and rings like benzene.

Q81. Answer: (c) Dr. Rajendra Singh

The correct answer is: 'Dr. Rajendra Singh'.

Key Points

• Rajendra Singh is a conservationist.
• He is also known as the Waterman of India.
• He revived the traditional techniques of storing water in those parts of the villages of Rajasthan which were abandoned for decades by bringing water to them.

Additional Information

• He won the Ramon Magsaysay Award for community leadership in 2001 for his pioneering work in community-based efforts in water harvesting and water management.
• He also won Stockholm Water Prize in 2015 for his innovative water restoration efforts, improving water security in rural India.
• He is a well-known water conservationist from Alwar district, Rajasthan in India.

Q82. Answer: (b) Tiger

The correct answer is Tiger.

Key Points

• A heterotroph is an organism that feeds on another organism or plants for nutrients.
• Heterotrophs can be further divided as,
• Omnivorous
• Herbivorous
• Carnivorous

YourMockTest.com — Free Study Material

• Depend on the food type they eat i.e. they are liable on plant- or animal-based foods.

• Tiger is a heterotroph as it feeds on other animals and cannot produce its own food.

Additional Information

• Autotrophs are the opposite of heterotrophs as they can produce their own food using light, water, carbon dioxide and other chemicals.

• Algae and plants are autotrophs as they can prepare their own food.

• Neem tree, Algae and Grass are autotrophic organism.

Q83. Answer: (b) Nagaland

The correct answer is: 'Nagaland'.

Key Points

• The Kachari tribes are mainly found in the Dimapur district of Nagaland.

• The Bushu is basically a post harvest festival and usually falls in the month of January every year after all the hard earned grains of paddy are harvested, thrashed and stored in the granaries.

• The exact date and place of the festival is not generally fixed, people see to it that it is celebrated when there is moonlight in the nights because it is believed to be auspicious.

Additional Information

• Bushu is celebrated either village-wise or sometimes a number of villages in contiguous area together organise the festival.

• The food items of the festival include rice, mutton, chicken, pork, buffalo meat and rice beer.

• The killing of these animals is known as ‘Meesthaiba’ which involves ritualistic performance before the animals are actually killed.

Q84. Answer: (a) 7.5 km

Drawing the diagram according to the given information:

• Rohit started from his home and travelled a distance of 5 km in the south direction.

• He then turned towards the right and travelled a distance of 2.5 km, and again took a turn towards the right and travelled a distance of 5 km.

• Finally, after taking a left turn, he travelled a distance of 5 km.

Hence, the shortest distance between his present location and his home is 7.5 km.

Q85. Answer: (c) 18 or 19 years of age

The correct answer is 18 and 19 years of age.

Key Points

• Adolescence is the phase of life between childhood and adulthood, from ages 11 to 19 years.

• Many scientists believed that adolescence might end at 18 or 19 of age.

• Adolescence starts with puberty.

• It is difficult for early teens to change their physical traits and refrain from engaging in harmful behaviour. It can be difficult and uncomfortable to undergo changes in one's physical appearance, and refraining from risky behaviour like drinking or smoking can affect how one's peers see them.

• A new and stronger relationship with one's parents can be an exciting and eye-opening experience for late adolescents. Compared to childhood, early adolescence, and middle adolescence, late adolescents form a very different relationship with their parents. Because of this, late adolescence may bring about a fresh understanding and viewpoint of their parents, enhancing the link between the child and parent.

Additional Information

• Adolescence can be divided into three stages.

• Three stages of adolescence are- early, mid, and late adolescence.

Q86. Answer: (a) Rs. 8,06,400

Shortcut Trick

Anil's Cost Price = Initial CP × (100 + Gain%) ÷ 100 × (100 − Loss%) ÷ 100

Anil's CP = 8,00,000 × (105 ÷ 100) × (96 ÷ 100)

Anil's CP = 8,00,000 × 1.05 × 0.96

Anil's CP = 8,40,000 × 0.96 = 8,06,400

Therefore The correct answer is Rs. 8,06,400.

Alternate Method

Given: CP of car for Anand = Rs. 8,00,000; Profit of Anand = 5%; Loss of Dhiraj = 4%.

Formulas: SP = CP × (100 + P%) ÷ 100 | SP = CP × (100 − L%) ÷ 100

=> Selling Price for Anand = 8,00,000 × (105 ÷ 100) = Rs. 8,40,000.

=> This SP is the Cost Price for Dhiraj.

=> Selling Price for Dhiraj = 8,40,000 × (96 ÷ 100).

=> Selling Price for Dhiraj = 8,400 × 96 = Rs. 8,06,400.

=> Amount paid by Anil = Rs. 8,06,400.

Therefore The correct answer is Rs. 8,06,400.

Additional Information

Successive Percentage Change

When a value changes by a% and then by b%, the net change is given by (a + b + ab ÷ 100)%. Here, a = 5 and b = −4.

Cost Price & Selling Price Relationship

The selling price of the first person in a chain of transactions becomes the cost price for the next person.

Q87. Answer: (a) & @ % $ > = ^ &

Letters	D	T	V	O	I	A	P	E
Codes	@		^	%	=	#	$	•

Given word: 'ADOPTIVE'

Conditions:

i. If both the first and the last letters of the word are vowels, then both these letters will be coded as '&'.

ii. If both the first and last letters of the word are consonants, then both these letters will be coded as '*'.

As condition (i) is followed by the given word because the first and the last letters of the word are vowels. So both these letters will be coded as '&'.

So, ADOPTIVE is coded as '&@%$>=^&'

Hence, the correct answer is '&@%$>=^&'.

Q88. Answer: (a) 47/25

Given:

11.456565... ÷ 2.6767...

Calculation:

n order to simplify, we need to convert them in the form of pover q

For 11.456565... .....

Let x = 11.4565656565....

Multiplying both sides with 100

100x = 1145.656565.....

100x = 1134.20 + 11.456565....

100x = 1134.20 + x

99x = 113420over100

x = 113420over9900

For 2.6767... .....

Let x = 2.676767....

Multiplying both sides with 100

100x = 267.6767.....

100x = 265 + 2.676767....

100x = 265 + x

99x = 265

x = 265over99

Now, we have

11.456565... ÷ 2.6767... = 113420/9900÷265/99

= 113420/9900×99/265

= 428/100=107/25

= 47/25

Hence, the correct answer is 47/25 .

Q89. Answer: (a) Wednesday

Given: 14 April 2005 is a Thursday.

Now, 14 April 2005 to 14 April 2017 = 12 years (3 leap and 9 ordinary year).

In 12 years = (3 × 2) + (9 × 1) = 6 + 9 = 15 days.

And, from 14 April 2017 to 10 May 2017 = 16(April) + 10(May) = 26 days.

So, total number of days = 15 + 26 = 41 days.

Total odd days in 41 days = 41/7 = 5 week and 6 odd days.

So, 10 May 2017 = Thursday + 6 = Wednesday.

Hence, The correct answer is "Option 1".

Alternate Method

Given: 14 April 2005 is a Thursday

Concept:

No. of odd days in non-leap year = Remainder of (365 ÷ 7) = 1 odd day

No. of odd days in leap year = Remainder of (366 ÷ 7) = 2 odd day

After every 7 days and multiple of 7 days, the days repeat themselves.

so when we cross years we need to check whether the given year is a leap or not. The particular day of a year is increased by 1 or 2 odd days on the same day of the next year.

Calculation:

Total number of days in a normal year = 365

Total number of days in a leap year = 366

Total number of odd days in a normal year = 365/7 = 1

Total number of odd days in a leap year = 366/7 = 2

No of days from 15 April 2005 to 31 Dec 2005 = 16 + 31 + 30 + 31 + 31 + 30 + 31 + 30 + 31 = 261 days

No of odd days from 15 April 2005 to 31 Dec 2005 = 261/7 = 2 days

No of days from 1 Jan 2017 to 10 May 2017 = 31 + 28 + 31 + 30 + 10 = 130 days

No of odd days from 1 Jan 2017 to 10 May 2017 = 130/7 = 4 days

No of odd days from 15 April 2005 to 10 May 2017 = (2 + 4 + (1 × 8) + (2 × 3))/7 = 20/7 = 6 days as 2008, 2012, and 2016 are leap years.

Now, 14 April 2005 (Thursday) + 6 odd days = 10 May 2017 (Wednesday)

Hence, 10th May 2017 will be Wednesday.

Q90. Answer: (d) Third to the right

Six doctors Omprakash, Tanvi, Matank, Yadhu, Sunil and Karuna are sitting in a row facing north.

1) Omprakash is sitting third to the left of Tanvi, who is sitting second to the right of Matank.

2) Yadhu is sitting to the immediate right of sunil, who is sitting somewhere to the left of Omprakash.

3) Neither Yadhu nor Karuna sit at the extreme ends.

From the above seating arrangement, Karuna's position with respect to Yadhu is Third to the right.

Hence, 'Third to the right' is the correct answer.

Q91. Answer: (a) 20 V

Given:

heat produced, H = 200J

Time taken, t= 5 seconds

Resistance, R= 10Ω

Formula used:

$H= I^2Rt$

V=IR

Where,

H- heat produced

I- current

R- resistance

V- potential difference
t- time taken
Calculations:
I= √H/Rt
= √200/10×5
= √4=2
I=2 A
V=IR
V= 2×10
v= 20v
Therefore, the potential difference across the resistor is 20V.

Q92. Answer: (d) Rs. 5,40,000

Given:
Total income = Rs. 27,00,000
Total school expenses = (27,00,000)/3=9,00,000
Calculation:
Amount spent on teaching fee = 40% of 9,00,000
40/100×9,00,000
= 3,60,000
Amount spent on transportation fee = 20% of 9,00,000
20/100×9,00,000
= 1,80,000
Total amount spent on teaching fee and transportation fee = 3,60,000 + 1,80,000 = Rs. 5,40,000
Hence, the amount spent on teaching fees and transportation fee is Rs. 5,40,000.

Q93. Answer: (a) Rs. 400

Shortcut Trick
Total share = Rs. 800 for 3 days of work by all together.
C's daily share = 800 ÷ 24 = Rs. 100/3. For 3 days = Rs. 100.
B's daily share = 800 ÷ 8 = Rs. 100. For 3 days = Rs. 300.
A's share = Total share − (B's share + C's share) = 800 − (300 + 100) = Rs. 400.
Therefore The correct answer is Rs. 400.
Alternate Method
Given: Total amount = Rs. 800, C = 24 days, B = 8 days, A+B+C = 3 days.
Formula: Total Work = LCM of individual days; Wage share prop. to Efficiency.

Person	Days	Total Work	Efficiency
C	24	24 units	24 ÷ 24 = 1
B	8	24 ÷ 8 = 3	
A + B + C	3	24 ÷ 3 = 8	

=> Efficiency of A = (Efficiency of A + B + C) − (Efficiency of B + Efficiency of C)
=> Efficiency of A = 8 − (3 + 1) = 4 units/day
=> Ratio of efficiencies (C : B : A) = 1 : 3 : 4
=> Total efficiency parts = 1 + 3 + 4 = 8 units
=> A's share = (A's efficiency ÷ Total efficiency) × Total Amount
=> A's share = (4 ÷ 8) × 800 = 1/2 × 800 = Rs. 400
Therefore The correct answer is Rs. 400.
Additional Information
Work and Wages Principle
Wages are distributed in direct proportion to the work done by each person. If they work for the same duration, wages are proportional to their efficiencies.

YourMockTest.com — Free Study Material

Efficiency Formula

Efficiency = Total Work ÷ Time Taken. Higher the efficiency, more the share of the total payment.

Combined Work Formula

For three people working together, 1/T_(total) = 1/T_A + 1/T_B + 1/T_C.

Q94. Answer: (b) Fritz Heider

The correct answer is Fritz Heider.

Key Points

• Fritz Heider proposed that the balance theory is a theory of attitude change.
• It conceptualizes the cognitive consistency motive as a drive toward psychological balance.
• This theory was developed in 1946.

Additional Information

• John A List is an American economist.
• Milton Friedman is also an American economist and statistician.
• Adam Smith is a Scottish economist and philosopher.

Q95. Answer: (b) The uterine lining is shed.

The correct answer is The uterine lining is shed.

Key Points

• Menstruation is a process in which blood and tissue from the uterus come out of the vagina.
• Menstruation starts during puberty and ends at menopause.
• During each menstrual cycle, an egg is developed and released from the uterus.
• If fertilization doesn't take place, the uterine lining sheds during the menstrual period.

Additional Information

• The menstrual cycle is divided into four phases:-menstrual phases, follicular phase, ovulation phase, and luteal phase.

Q96. Answer: (b) Brazil

The correct answer is: 'Brazil'.

Key Points

• Manisha Kalyan, at the age of 19, became the first Indian woman footballer (and only the second Indian) to score against Brazil.
• Manisha Kalyan has become the first Indian footballer to play at the UEFA Women's Champions League.
• She made her debut for Apollon Ladies FC in the European Club competition in Engomi, Cyprus.
• She was awarded the AIFF Women's Footballer of the Year for the 2021-22 season.
• Kalyan had produced impressive performances for the national team and Gokulam Kerala in the Indian Women's League (IWL).
• UEFA full form Union of European Football Associations.

Additional Information

• Germany - It is a country in north-central Europe.
• Euro is the currency of Germany.
• Germany is a member of the United Nations, NATO, the G7, the G20, and the OECD.
• Germany Capital - Berlin.
• Brazil -
• Capital: Brasilia
• Currency: Real (BRL)
• Sweden -
• Capital: Stockholm
• Currency: Swedish Krona
• France -
• Capital: Paris
• Currency: Euro (formerly French franc)

Q97. Answer: (a) Both I and II strengthen the statement.

Statement: Education is the backbone of human society.

Argument I: Schools are learning centers of societal norms and regulations. → Strength (This is the strengthening statement

because, education is a social institution through which a society's children are taught basic academic knowledge, learning skills, cultural norms, social norms and regulations.)

Argument II: Any Society with less concern about education, cannot grow and develop in present times. → Strength (This is the strengthening statement because this is a powerful tool of development, and one of the strongest instruments for reducing poverty and improving health, gender equality, peace, and stability. It delivers large, consistent returns in terms of income, and is the most important factor to ensure equality and inclusion.)

Thus, "Both I and II strengthen the statement."

Q98. Answer: (c) 24

Shortcut Trick

For 8 terms in ascending order, the Median is the average of the 4^(th) and 5^(th) terms.

4^(th) term = 17 and 5^(th) term = n + 5

Median = (17 + n + 5) ÷ 2 = n − 1

=> (n + 22) ÷ 2 = n − 1 => n + 22 = 2n − 2

=> n = 22 + 2 = 24

Therefore The correct answer is 24.

Alternate Method

Given: Ascending observations: 4, 8, n − 14, 17, n + 5, 30, 32, 35. Median = n − 1.

Formula: For an even number of observations (N), Median = [(N/2)^(th) term + (N/2 + 1)^(th) term] ÷ 2

=> Total observations (N) = 8

=> Median = [(8/2)^(th) observation + (8/2 + 1)^(th) observation] ÷ 2

=> Median = [4^(th) observation + 5^(th) observation] ÷ 2

=> n − 1 = [17 + (n + 5)] ÷ 2

=> 2 × (n − 1) = 17 + n + 5

=> 2n − 2 = n + 22

=> 2n − n = 22 + 2

=> n = 24

Therefore The correct answer is 24.

Additional Information

Median for Odd Data Set

If N is odd, the median is the value of the ((N + 1) ÷ 2)^(th) term when arranged in order.

Empirical Relationship

The relationship between Mean, Median, and Mode is: Mode = 3 × Median − 2 × Mean.

Property of Median

Median is the most suitable measure of central tendency when the data set contains outliers or is skewed.

Q99. Answer: (d) 123.66

Given:

Imports in the following year:

2001 = 139

2002 = 120

2003 =100

2004 = 128

2005 = 107

2006 = 148

Formula used:

Average = Sum of all importsover Total values

Calculation:

Average = 139+120+100+128+107+148over6

= 742over6

= 123.66

Hence, the average of the imports for the period 2001 to 2006 is Rs. 123.66 crores.

Q100. Answer: (c) IKNPXZ

The pattern followed here is:
'BOY is written as 'ACNPXZ'
And,
'TOY' is written as 'SUNPXZ'
Similarly,
'JOY' will be written as: ?
Thus, 'JOY' will be written in that code language as 'IKNPXZ'.
Hence, "IKNPXZ" is the correct answer.

More previous year papers and mock tests: **www.yourmocktest.com/pyq**

YourMockTest.com — Free Study Material