RRC Group D Previous Year Paper 15 (Held On: 29 Oct 2018 Shift 2)

RRB Group D • 2018 • 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/rrc-group-d-previous-year-paper-15-held-on-29-oct-2018-sh…

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

CBT

Q1. The density of silver is 10.8 × 10^3kg/m3. and the density of water is 10^3kg/m^3?. What is the relative density of Ag?

(a) 0.108
(b) 1.08
(c) 108
(d) 10.8

Q2. Srinivas works and earns Rs. 14,500 per month, out of which he saves only 20% and spends the remaining amount on other deeds. Find the amount spent.

(a) Rs. 11,500
(b) Rs. 11,400
(c) Rs. 211,000
(d) Rs. 11,600

Q3. Select the term that relates to the third term in the same way as the second term relates to the first term.

Blogger: Writer ? Illustrator : ?

(a) Artist
(b) Singer
(c) Doctor
(d) Cook

Q4. The length and breadth of a rectangular field is in the of ratio 3 : 2 If the area of the field is 1,350 m^2, then the cost of fencing it at Rs. 30/m will be:

(a) Rs. 5,680
(b) Rs. 4,500
(c) Rs. 4,000
(d) Rs. 5,240

Q5. Write four more rational numbers in the following pattern 1/(- 6), 2/(- 12),3/(- 18),4/(- 24), … … …,

(a) 5/6,7/8,9/10,11/12
(b) 5/30,6/36,7/42,8/48
(c) 5/(- 6),6/(- 12),7/(- 18),8/(- 24)
(d) 5/(- 30),6/(- 36),7/(- 42),8/(- 48)

Q6. Who was the author of the trilogy "The Immortals of Meluha", "The Secret of the Nagas", and "The Oath of the Vayuputras"?

(a) Amish Tripathi
(b) Anannd Neelakantan
(c) Kavita Kane
(d) Devdutt Pattanaik

YourMockTest.com — Free Study Material

Q7. _____ is the first state of India to receive rainfall by the southwest monsoon.

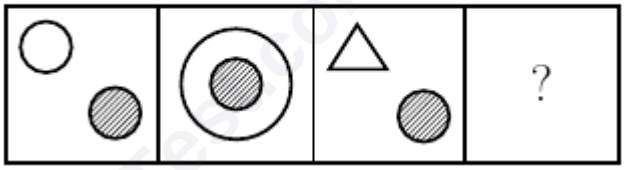
(a) Kerala
(b) Goa
(c) Maharashtra
(d) Gujarat

Q8. Express in meters the sum of 0.5035 km, 332.9 cm and 1771 mm:

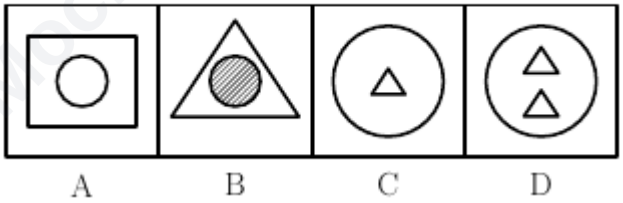
(a) 500
(b) 510
(c) 508.6
(d) 58.6

Q9. Find the next figure for the given series:

Problem figures:



Answer figures:



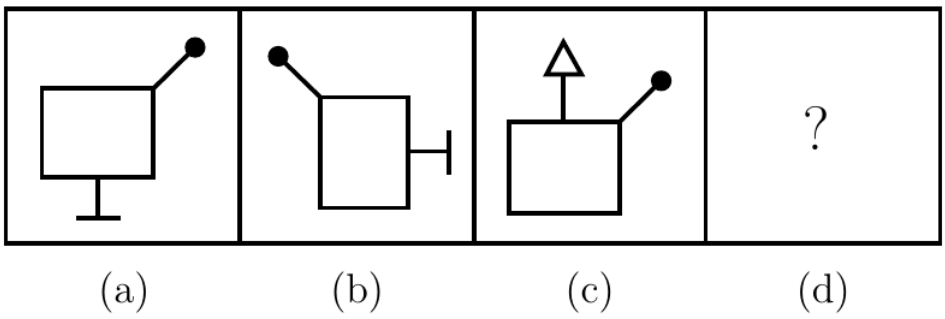
(a) C
(b) A
(c) B
(d) D

Q10. 3.8/1.25, written as a pure decimal, will be:

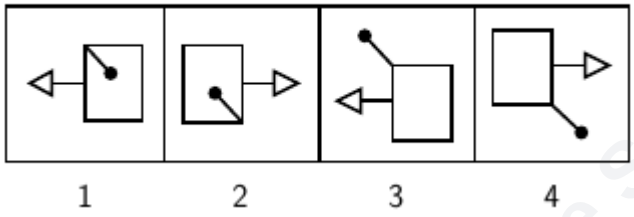
(a) 3.14
(b) 3.04
(c) 3.06
(d) 3.08

Q11. From the option figures, select the one that is related to question figure c in the same way as question figure b is related to question figure a.

Question Figures:



Option Figures:



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

Q12. Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the statement(s).

Statement:

Child labour is a punishable crime

Conclusions:

I. Poverty of parents and their inability to send their children to school is the reason behind child labour

II. Government has issued a ban on child labour

(a) Only conclusion II follows
(b) Only conclusion I follows
(c) Both the conclusions follow
(d) No conclusion follows

Q13. Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the statement(s).

Is China spending on defence is justified?

Argument:

1. Yes, safety of the country is top priority

2. No, as peace in region is established hence money should be spend on development.

(a) Only argument 1 is strong
(b) Neither argument 1 nor 2 is strong
(c) Only argument 2 is strong
(d) Both argument 1 and 2 is strong

Q14. Which of these is the biggest tax reform made in India since independence?

(a) Goods and Services Tax
(b) Excise duty
(c) Customs duty
(d) Land revenue

Q15. How much work is done in moving a charge of 4 C across two points having a potential difference of 12 V?

(a) 48 J
(b) 3 J
(c) 40 J
(d) 12 J

Q16. The chemical formula of Ammonium phosphate is _____.

(a) (NH4)3PO4
(b) (NH4)2PO4
(c) (NH4)2PO2
(d) NH4PO4

YourMockTest.com — Free Study Material

Q17. The carpel contains,

(a) Pollen grains
(b) Sepals
(c) Petals
(d) Ovules

Q18. Xylem is a/an _____ tissue.

(a) simple permanent
(b) complex permanent
(c) epithelial
(d) connective

Q19. What is the straight tube, about 40 cm long, that carries sperms to the seminal vesicles, called?

(a) Urethra
(b) Penis
(c) Vas deferens
(d) Scrotum

Q20. The pressure variations inside the inner ear are turned into electrical signals by the:

(a) Cochlea
(b) Hammer
(c) Stirrup
(d) Anivl

Q21. A flight covering a distance of 1200 km could reduce the travel time by 30 minutes, due to an additive tailwind that increases the average speed by 120 km/hr. What was the duration of the flight in hours?

(a) 2.2 hours
(b) 1.9 hours
(c) 1.8 hours
(d) 2 hours 30 min

Q22. A clock shows 2 am now. Find the total rotation of the minute hand, in degrees, of the clock when it will show 9 pm on the same night?

(a) 8600°
(b) 6840°
(c) 6470°
(d) 5930°

Q23. Simplify the following expression:

(3/11 × 33/6) - (9/4 × 12/3) + (5/11 × 22/10)

(a) (-9)/2
(b) (-13)/2
(c) 13/2
(d) 9/2

Q24. What is the total earning after 2 years from Rs. 18,750 on variable compound interest if the rate of interest for the first year is 4% and for the second, it is 8%?

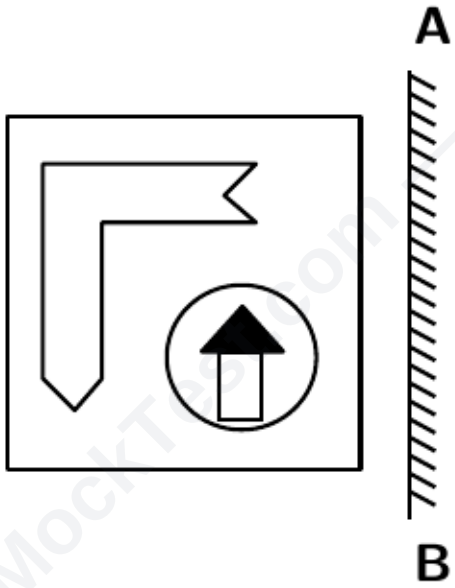
(a) Rs. 1,740
(b) Rs. 1,760
(c) Rs. 1,670
(d) Rs. 2,310

YourMockTest.com — Free Study Material

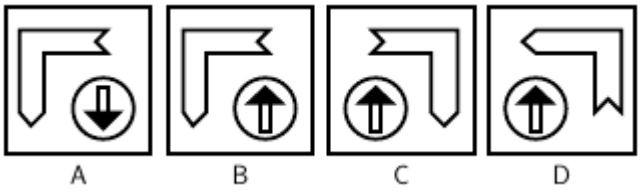
Q25. _____ is a purple-coloured solid halogen.

(a) Bromine
(b) Fluorine
(c) Chlorine
(d) Iodine

Q26.



The mirror image of the above figure is



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

Q27. Find the energy possessed by an object of mass 10 kg when it is at a height of 8 m above the ground. Given g = 9.8 ms^(-2)

(a) 784 J
(b) 588 J
(c) 520 J
(d) 528 J

Q28. Find the LCM of 96, 144 and 150.

(a) 1440
(b) 3600
(c) 7200
(d) 2400

Q29. Which child artist won the ‘Best child Artist’ award for the film ‘ Noor Islam’ at the 64^(th) National Film Awards 2017?

(a) Munni
(b) Matin Ray
(c) Saj
(d) Teena

Q30. Simplify the following expression

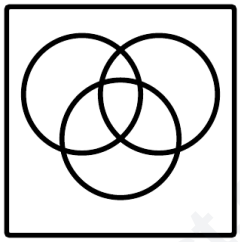
(3/2 × 1/6) + (5/3 × 7/2) - (13/4 × 4/3) = ?

(a) 12/21
(b) 21/12
(c) 36/21
(d) 41/12

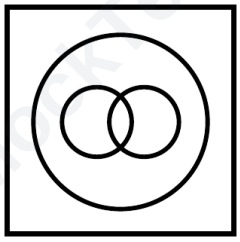
Q31. Choose the best suitable Venn diagram for the following words:

"Reptiles, Alligator, Tortoise"

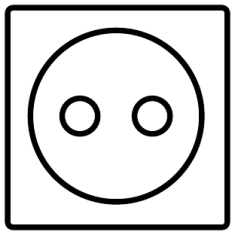
(a)



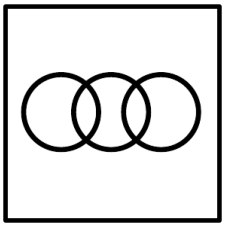
(b)



(c)



(d)



Q32. The sum of the present ages of two persons is seven times that of the difference between their ages. After 5 years, the sum of their ages will become nine times that of the difference. What is the present age of the elder person?

(a) 24 years
(b) 28 years
(c) 14 years
(d) 20 years

Q33. What is the upward force exerted by the water on the bottle containing it called?

(a) Tension
(b) Buoyant Force
(c) Thrust
(d) Pressure

YourMockTest.com — Free Study Material

Q34. What happens to the volume (V) of the cuboid, if its length is doubled, height is doubled and breadth is kept same?

(a) V
(b) V/2
(c) 4V
(d) 2V

Q35. Who among the following was elected as President of the Sahitya Akademi in 2018?

(a) Chandrashekar Kambar
(b) U.R. Ananthamurthy
(c) Pratibha Ray
(d) Vinayak Krishna Gokak

Q36. After India's 29^(th) state, Telangana, was created, which of the following parties formed the first government in the state?

(a) Telangana Rashtra Samithi (TRS)
(b) Telangana Rajya Samithi (TRS)
(c) Telangana Loka Samithi (TLS)
(d) Telangana Maha Samithi (TMS)

Q37. Consider the following question followed by the statements and decide which of the statements is sufficient to answer the question.

Question:

8 trolleys in a supermarket are used to load and unload commodities. All of the trolleys have been filled with oil cans of two different sizes and shapes. How many cans are loaded in the trolleys in total?

Statements:

1. The shape of 8 cans are such that in one trolley only 2 can fit.
2. The rest of the trolleys are filled with 4 oil cans each.

(a) Statement 1 alone is sufficient
(b) Neither statement 1 nor 2 is sufficient
(c) Statement 1 and 2 together are sufficient
(d) Statement 2 alone is sufficient

Q38. A solution contains 42 g of common salt in 320 g of water. Calculate the concentration in terms of mass by mass percentage of the solution?

(a) 11.6 g
(b) 12.6%
(c) 11.6%
(d) 10.36%

Q39. The general formula of alkynes is _____.

(a) C_nH_(3n-3)
(b) C_nH_(2n-2)
(c) C_nH_(2n+2)
(d) C_nH_(2n)

Q40. 220 g of carbon dioxide contains _____ moles of co2.

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

YourMockTest.com — Free Study Material

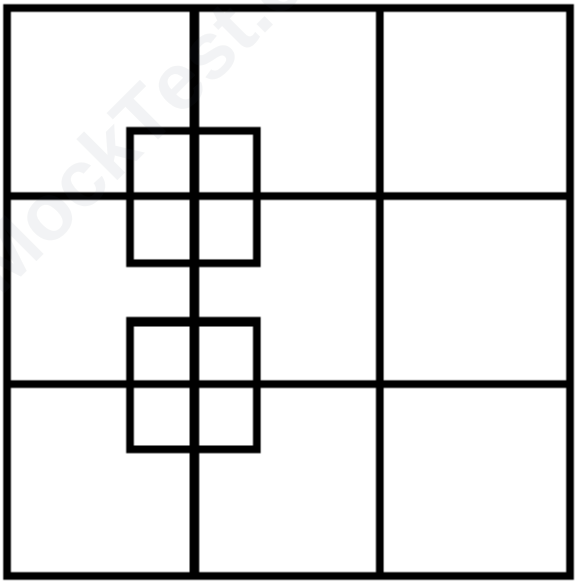
Q41. A boy has 120 balls of which some are white and the remaining are black. If the percentage of white balls is 45%, find the number of black balls he has.

(a) 56
(b) 66
(c) 64
(d) 54

Q42. Prasid and Deep separately can do a certain work in 32 and 24 days respectively. They decided to do the work together and Niloy also joined them. If all of them together can complete the same work in 8 days, then how long does Niloy take to do the work alone?

(a) 92/5 days
(b) 96/5 days
(c) 94/5 days
(d) 89/5 days

Q43. Find the number of squares in the figure:



(a) 27
(b) 25
(c) 24
(d) 26

Q44. A body is falling from a height of 200 m. After it has fallen 100m, the body will possess:

(a) Less kinetic energy and more potential energy.
(b) Zero potential energy and half Kinetic energy
(c) more kinetic energy and less potential energy.
(d) Half potential energy and half kinetic energy.

Q45. The plant hormone that increases length of the stem is _____.

(a) Gibberellins
(b) Cytokinins
(c) Auxins
(d) Insulin

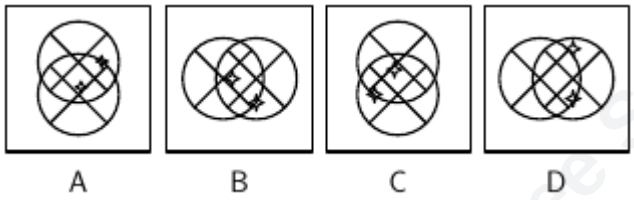
Q46. The elements belonging to groups _____ are known as ‘d’ block elements.

(a) 3 to 12
(b) 1 and 2
(c) 13 to 18

YourMockTest.com — Free Study Material

(d) 3 to 10

Q47. Find the odd one out.



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

Q48. The usual average speed of a car on a particular stretch of road is 75 km/hr. On a particular day, the average speed was 12% less than the usual, as a result of which the time taken was 18 minutes more. How long is the stretch of road, in kilometres?

(a) 155
(b) 176
(c) 165
(d) 150

Q49. Each question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is 'strong' argument.

Statement:

Should there be dress code for college students?

Arguments:

I. Yes, a dress code will bring unity and eliminate discrimination.

II. No, dress code takes away the opportunity to showcase students' style sense.

(a) Neither I nor II is strong
(b) Both I and II are strong
(c) Only argument I is strong
(d) Only argument II is strong

Q50. The number of books sold by a seller over a year is as follows. In which months did he sell more than the average number of books sold that year?

Months	Number of books sold
January	2,000
February	1,500
March	2,500
April	3,000
May	2,000
June	1,000
July	1,500
August	2,000
September	5,000
October	2,000
November	150

YourMockTest.com — Free Study Material

December	6,000

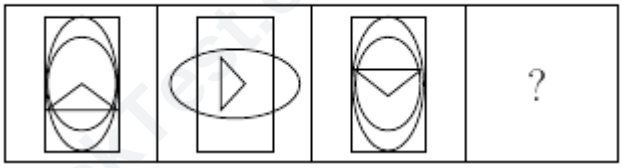
(a) September
(b) June and March
(c) January, May and December
(d) March, April, September and December

Q51. Four options have been given below of which three are alike in some way and one is different. Choose the odd one out.

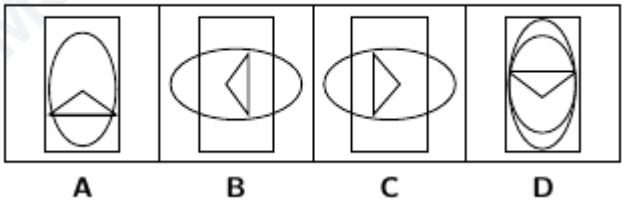
(a) IISC Bengaluru
(b) Kotak Mahindra bank
(c) IIT Hyderabad
(d) NIT Calicut

Q52. Select the option figure that will complete the series of question figures.

Question figures:



Option figures:



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

Q53. Avant points at a picture and say “she is the second daughter of my father’s elder brother”. Avant and the girl in the photograph are _____.

(a) Brothers
(b) Friends
(c) Siblings
(d) Cousins

Q54. “Bharatiya Jnanpith” is an organization related to which of the following?

(a) General knowledge
(b) Architecture
(c) science
(d) Literature

Q55. Identify the quiet Maritime strategic diplomacy that has emerged as the key theme of this year’s Union Budget 2018-19?

(a) Big investment in island nations
(b) Moderate investment in coastline infrastructure
(c) Big investment in coastline guard and patrol
(d) Moderate investment in Hitech Vessels

YourMockTest.com — Free Study Material

Q56. Find the next letter in the series:

OV, QU, ST, US, _____?

(a) OM
(b) RH
(c) WE
(d) WR

Q57. Complete the following.

1 kwh = _____?

(a) 36 × 10^(-6) J
(b) 3.6 × 10^(-6) J
(c) 3.6 × 10^6 J
(d) 36 × 10^6 J

Q58. Which Indian cricketer has inaugurated his global cricket academy at UAE recently?

(a) Sachin Tendulkar
(b) MS Dhoni
(c) Rahul Dravid
(d) Virat Kohli

Q59. Read the given statement and choose which argument is strong.

Statement:

Should the Indian government stop spending huge amounts of money on organising Commonwealth Games in the country?

Argument:

1. Yes, the money can be used for the development of poor people.

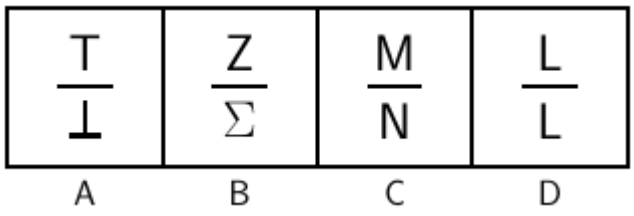
2. No, sport plays a significant role in exposing talent and helping athletes gain international exposure.

(a) Only argument 2 is strong
(b) Either argument 1 or 2 is strong
(c) Only argument 1 is strong
(d) Neither argument 1 nor 2 is strong

Q60. How many natural numbers less than 500, when divided by 35 and 49, will leave a remainder of 30 in each case?

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

Q61. Find the odd one out of the given figures.



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

YourMockTest.com — Free Study Material

Q62. The product of mass and velocity is called:

(a) Potential energy
(b) Momentum
(c) Force
(d) Kinetic energy

Q63. Varun is playing caroms with Samarth sitting in standard caroms seating arrangement. If Varun is facing South-west direction. What is the facing direction of his opponent Samarth?

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

Q64. The Sangam period is considered as the Golden Era of Tamil language as many classical Tamil _____ were written during this period.

(a) novels
(b) prose
(c) poems
(d) epics

Q65. 'Wings India 2018' is a mega show in the civil Aviation and Aerospace area that showcases airlines, aircraft, and infrastructure. Which Indian city hosted this event in 2018?

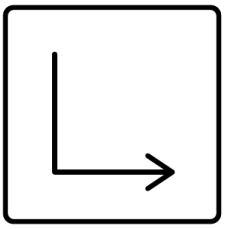
(a) Bhubaneswar
(b) Hyderabad
(c) Bengaluru
(d) Chennai

Q66. If + means ×, × means -, ÷ means + and - means ÷ then what is the value of 62 - 2 ÷ 8 + 15 × 4 + 6?

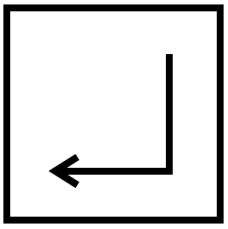
(a) 130
(b) 127
(c) 120
(d) 128

Q67. Find the ODD one out.

(a)



(b)

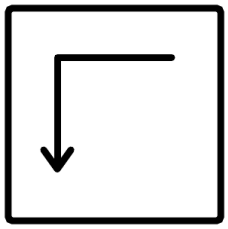


YourMockTest.com — Free Study Material

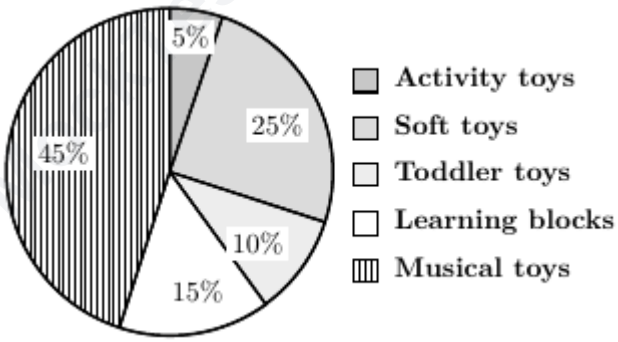
(c)



(d)



Q68. The following pie chart show information on the sales of a toy making company “XYZ” during 2017-18 financial year.



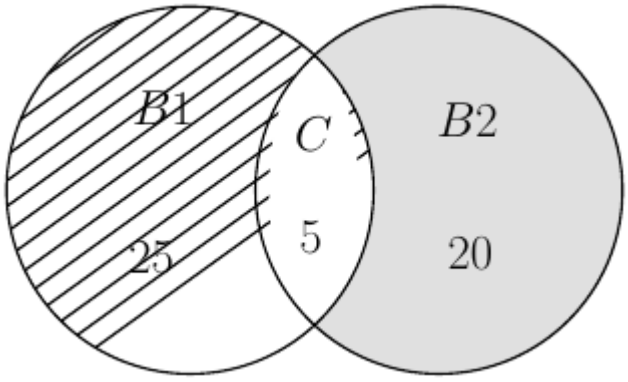
The total revenue from the sale of all types of toys is Rs. 38,7200. What is the sales revenue earned on “Soft toys” by the company XYZ?

(a) 9,68,00
(b) 3,87,20
(c) 7,74,40
(d) 1,93,60

Q69. In a triangle, angle C = 90° and angle A = 60° then sin A/2 + cosecA = ?

(a) (√3 + 4)/2
(b) (√3 + 4)/2√3
(c) (√2 + 4)/3√3
(d) (√3 + 4)/√3

Q70. The following diagram represents the survey results on two brands of chips conducted on a sample size of 50 customers. Based on the figure, how many liked none of the two brands of chips?



(a) 20
(b) 0
(c) 5
(d) 25

Q71. What is the new reverse Repo rate announced by the Reserve Bank of India (RBI) as on 1^(st) August 2018?

(a) 5.75
(b) 6.75
(c) 6.5
(d) 6.25

Q72. If A greater than 0° and less than equal to 90° then find the minimum value of (4 $\text{cosec}^2 2A$ + 9 $\sin^2 2A$)?

(a) 6
(b) -12
(c) 12
(d) -18

Q73. Which sport is Kidambi Srikanth renowned for?

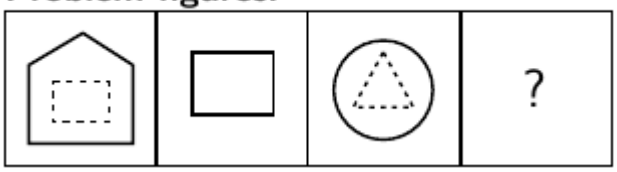
(a) Badminton
(b) Tennis
(c) Football
(d) Chess

Q74. X attempts 100 questions and gets 340 marks. If for every correct answer is 4 marks and wrong answer is negative one mark, then the number of questions wrongly answered by Mr. X is:

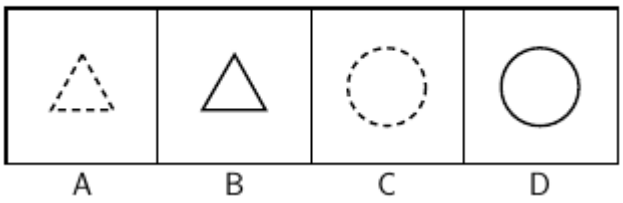
(a) 14
(b) 15
(c) 12
(d) 13

Q75. Find the next figure for the given series:

Problem figures:



Answer figures:



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

Q76. If one root of the equation $(l - m)x^2 + 1 = 0$ is double the other and 'l' is the real number, then which of the following is true?

(a) m > 9/8
(b) m > 8/9
(c) m = 9/8

(d) m ≤ 9/8

Q77. Find the least number which should be subtracted from 9999 so that the difference is exactly divisible by 16.

(a) 15
(b) 12
(c) 14
(d) 13

Q78. Choose the bird which does not belong to the group.

(a) Peacock
(b) Eagle
(c) Ostrich
(d) Hen

Q79. Shillong is the capital of _____.

(a) Tripura
(b) Meghalaya
(c) Nagaland
(d) Assam

Q80. A sum of money invested for 4 years and 9 months at a rate of 8% simple interest per annum became Rs. 1,035 at the end of the period. What was the sum that was initially invested?

(a) Rs. 700
(b) Rs. 675
(c) Rs. 725
(d) Rs. 750

Q81. Which of the following elements has the largest- size atoms?

(a) P
(b) Cl
(c) Ar
(d) S

Q82. Momentum = _____

(a) mass × Acceleration
(b) Mass / Volume
(c) Mass × Velocity
(d) Mass × Density

Q83. Which of the following statements is/are true about the speed of sound in different media at 25 °C

A. In steel, the speed of sound is 5960 m/s

B. In nickel, the speed of sound is 6240 km/s.

(a) Only A is true
(b) Neither A nor B is true
(c) Both A and B are true
(d) Only B is true

Q84. Which of the following Indian State Political parties is led by Ram Vilas Paswan?

(a) Rashtriya Lok Samta Party
(b) Lok Janshakti Party
(c) Rashtriya Lok Dal
(d) Shiromani Akali Dal

YourMockTest.com — Free Study Material

Q85. The general reaction between a metal oxide and an acid can be written as:

(a) Metal oxide + acid ? salt + water
(b) Metal oxide + acid ? salt + precipitate
(c) Metal oxide + acid ? water + gas
(d) Metal oxide + acid ? salt + gas

Q86. Find the value of $((0.22)^3 - (0.11)^3)/(0.0484 + 0.0242 + 0.0121)$

(a) 9.0
(b) 1.2
(c) 2.0
(d) 0.11

Q87. $4x^2 + kx + 5$ is divisible by $x - 1$. The expression is also divisible by

(a) $4x – 5$
(b) $x – 5$
(c) $4x + 5$
(d) $4x – 1$

Q88. Who won the 'Outstanding Parliamentarian' Award for 2017 given by the Indian Parliamentary Group (IPG)?

(a) Bhartruhari Mahtab
(b) Arun Jaitley
(c) Narendra Modi
(d) Rahul Gandhi

Q89. The ratio of the ages of the father and the son ten years ago was 11:3. Ten years hence the ratio would be 21: 13. What are the present ages of the father and the son?

(a) 32, 16
(b) 22, 14
(c) 25, 15
(d) 32,12

Q90. _____ has a very high melting and boiling points.

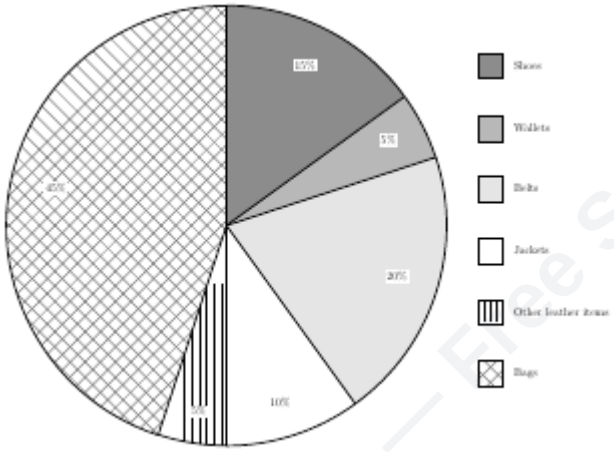
(a) Diamond
(b) Fullerene
(c) Graphite
(d) Charcoal

Q91. In a group of 1300 students, every student reads 5 subjects and every subject is read by 65 students. The number of subjects are:

(a) exactly 100
(b) may be 250
(c) at the most 70
(d) at least 10

Q92. The following pie diagram shows the revenue of the company ABC, which manufactures the leather products. The total revenue of the company for the year 2015 was Rs. 36,28,000.

YourMockTest.com — Free Study Material



How much revenue was made on the sales of wallets & belts?

(a) Rs. 9,07,000
(b) Rs. 1,81,400
(c) Rs. 90,700
(d) Rs. 1,814,000

Q93. Which company has appointed Mr Rangarajan Raghavan as its Manging Director?

(a) WIPRO
(b) TCS
(c) INFOSYS
(d) HCL Infosystems Ltd.

Q94. 'Purna Swaraj' was announced in the Indian National Congress session of _____.

(a) Nagpur
(b) Poona
(c) Calcutta
(d) Lahore

Q95. Who became the first visually impaired Indian runner to complete the historic Boston Marathon in 2017?

(a) Rinku Hooda
(b) Sagar Baheti
(c) Varun Bhati
(d) Sharath Gayakwad

Q96. Which of the following ideals of the constitution of India were inspired from Russia?

(a) Amendment procedure
(b) Fundamental Rights
(c) Fundamental duties
(d) Directive Principles

Q97. If in a certain code BRIM is written as AQHL, how would EDGE be written in that code?

(a) FDCD
(b) CDCF
(c) DCGH
(d) DCFD

Q98. Which one of the following is NOT correct for Rhizoid?

(a) They are multi-cellular and composed of epithelial tissues
(b) They are protuberances that extend from the lower epidermal cell of bryophytes.
(c) They get attached with substratum with the help of rhizoid.
(d) They are similar in structure and function to the root hairs of vascular land plants.

YourMockTest.com — Free Study Material

Q99. The plant part moves toward light, it is called _____.

(a) Positive phototropism
(b) Negative tropism
(c) Positive tropism
(d) Negative phototropism

Q100. Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the given statement(s).

Statements:

I. All gadgets are electronics.

II. All electronics are chips.

Conclusions:

1. All gadgets are chips.

2. Some chips are electronics.

(a) Conclusion 1 alone follows.
(b) Both 1 and 2 follows.
(c) Conclusion 2 alone follows.
(d) Neither 1 nor 2 follows.

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) 10.8

The correct answer is option 4 i.e 10.8

Silver:

Formula: Ag

Atomic number: 47

• Relative density: It is defined as the ratio of the density of a substance to the density of water.

• It is also known as specific gravity.

• Relative density = Density of substance / Density of water

• Relative density= $10.8 \times 10^3/10^3$

• Hence Relative Density = 10.8

Q2. Answer: (d) Rs. 11,600

Shortcut Trick

Total Income is always 100%.

If Savings = 20%, then Expenditure = 100% − 20% = 80%.

Amount spent = 80% of 14,500 = 0.8 × 14,500 = 11,600.

Therefore The correct answer is Rs. 11,600.
Alternate Method
Given: Monthly Income = Rs. 14,500, Savings % = 20%.
Formula: Expenditure = Total Income − Savings
=> Savings = 20% of 14,500
=> Savings = (20 ÷ 100) × 14,500 = 2,900
=> Expenditure = 14,500 − 2,900
=> Expenditure = 11,600
Therefore The correct answer is Rs. 11,600.
Additional Information
Income-Expenditure Relation
Income = Expenditure + Savings. This is the fundamental equation for all personal finance math problems.
Percentage Expenditure
Expenditure % = (Expenditure ÷ Income) × 100. If savings percent is given as s%, expenditure percent is always (100 − s)%.
Ratio Method
If savings is 20% (1/5), then for every 5 parts of income, 1 part is saved and 4 parts are spent (Ratio 4:1).

Q3. Answer: (a) Artist

Bloggers and writers deal with similar type of work of writing the blogs, articles, novels, etc.
Similarly,
Illustrator and artist deal with similar type of work of drawing the pictures for magazines, books and advertising.
Hence, 'Artist' is the correct answer.

Q4. Answer: (b) Rs. 4,500

Shortcut Trick
Ratio of Area to (product of ratio parts) → 1,350 ÷ (3 × 2) = 225.
Square root of this constant (k^2) gives the unit value → √225 = 15.
Perimeter = 2 × (3 + 2) × 15 = 150 m.
Total Cost = 150 × 30 = Rs. 4,500.
Therefore The correct answer is Rs. 4,500.
Alternate Method
Given: Ratio of Length (L) and Breadth (B) = 3 : 2, Area = 1,350 m^2, Rate = Rs. 30/m.
Formula Used: Area = L × B | Perimeter = 2(L + B) | Cost = Perimeter × Rate
=> Let Length = 3x and Breadth = 2x.
=> Area = 3x × 2x = $6x^2$.
=> $6x^2 = 1,350$
=> $x^2 = 225$
=> x = 15 m.
=> Length = 3 × 15 = 45 m, Breadth = 2 × 15 = 30 m.
=> Perimeter = 2(45 + 30) = 2(75) = 150 m.
=> Total Cost = 150 × 30 = Rs. 4,500.
Therefore The correct answer is Rs. 4,500.
Additional Information
Rectangular Field Properties
Area is the region inside the boundary (L × B), while Perimeter is the length of the boundary 2(L + B).
Fencing Concept
Fencing is always done along the Perimeter. If fencing is required for multiple rounds (n), the cost is Perimeter × n × Rate.
Diagonal of Rectangle
The distance between opposite corners is given by $\sqrt{(L^2 + B^2)}$.

Q5. Answer: (d) 5/(- 30),6/(- 36),7/(- 42),8/(- 48)

=> 1/(- 6), 2/(- 12),3/(- 18),4/(- 24), … … …
=> 1/(-6)

Similarly,

=> 2/(-12) = 1/(-6)

=> 3/(-18) = 1/(-6)

=> 4/(-24) = 1/(-6)

From option (4), follow the same pattern

=> 5/(- 30),6/(- 36),7/(- 42),8/(- 48)

=> 5/(-30) = 1/(-6)

=> 6/(-36) = 1/(-6)

=> 7/(-42) = 1/(-6)

=> 8/(-48) = 1/(-6)

So correct option is (4).

Q6. Answer: (a) Amish Tripathi

Option 1 is correct:

Author	Books
Amish Tripathi	Immortals of Meluha, The Secrets of the Nagas, The Oath of the Vayuputras, Ram: Scion of Ikshvaku, Sita: Warrior of Mithila, Raavana: Orphan of Aryavarta
Anand Neelakantan	The Rise of Sivagami, Asura: Tale of the Vanquished, Vanara
Kavita Kane	Lanka's Princess, Meneka's Choice, Sita's Sister, The Fisher Queen's Dynasty
Devdutt Pattanaik	Aranyaka, Yoga Mythology, I Am Divine So Are You, Devlok 3

Q7. Answer: (a) Kerala

The correct answer is option 1 i.e Kerala

• Kerala is the first state of India to receive rainfall by the southwest monsoon.

• Rainfall received from the southwest monsoons is seasonal, which occurs between June and September.

Kerala:

• Capital: Thiruvananthapuram

• Governor:Shri Rajendra Vishwanath Arlekar

• CM: Pinarayi Vijayan

Types of Monsoon	Duration
Southwest monsoon	June to September
Northeast monsoon	October- November

Q8. Answer: (c) 508.6

As we know,

1 km = 1000 m

1 m = 100 cm

1 cm = 10 mm

=> 0.5035 km = 0.5035 × 1000 = 503.5 m

=> 332.9 cm = 332.9 × (1/100) = 3.329 m

=> 1771 mm = 1772 × (1/1000) = 1.771 m

=> Sum of 503.5 + 3.329 + 1.771 = 508.6 m

Q9. Answer: (c) B

According to the first 2 diagrams, the shaded circle is added into the empty circle.

Similarly,

In the next two figures, the shaded circle will be inserted into the empty triangle.

Hence, figure B is the correct answer.

YourMockTest.com — Free Study Material

Q10. Answer: (b) 3.04

=> 3.8/1.25

Multiply by 8/8

=> (3.8/1.25) × (8/8)

=> 30.4/10

=> 3.04

Q11. Answer: (c) 3

Relation between first and second figures:

The figure is moving in 90 degree anticlockwise direction.

Similar relation will be applicable for the next two figures.

Hence, figure 3 is the correct answer.

Q12. Answer: (a) Only conclusion II follows

Statement:

Child labour is punishable

Conclusion:

I: Poverty of parents and their inability to send their children to school is the reason behind child labour: it not completely true because inability of education is not the reason behind the child labour. According to the right to free and compulsory Education Act is an Act of the parliament to provide free and compulsory education for children between the age of 6 to 14. Hence, conclusion one does not satisfy completely.

II. Government has issued a ban on child labour: According to Child Labour (Prohibition and Regulation) Act 1986. Article 24 of Indian constitution clearly assumes that No child below the fourteen years shall be employed to work in any factory or mine or employed in any hazardous employment.

Hence, only conclusion II follows.

Q13. Answer: (a) Only argument 1 is strong

Argument

1) Yes, safety of the country is top priority: the first priority of every country is safety. If country is secured than only development is possible.

Hence, argument 1 is strong.

Q14. Answer: (a) Goods and Services Tax

Option 1 is correct:

• Goods and Services Tax (GST) is an indirect tax levied on the supply of commodities and services.

• The GST was launched at midnight on 1 July 2017 by the President of India, Pranab Mukherjee, and the Prime Minister of India Narendra Modi.

• There are two types of GST – Central GST (CGST) and State GST (SGST).

• GST is established under the 101^(st) amendment of the constitution.

• The Goods and Services Tax (GST) was first implemented in France.

• GST in India was made on the recommendation of the Vijay Kelkar Committee.

• GST has been implemented under 279 of the India constitution.

Q15. Answer: (a) 48 J

The correct answer is option 1 i.e 48 J

Work: It is defined as the force required to move an object from its place in a direction.

• W = QV

Where W = work

Q = charge

V = Potential difference

• W = 4 C × 12 V

• W = 48 J

YourMockTest.com — Free Study Material

Q16. Answer: (a) (NH4)3PO4

The correct answer is option 1 i.e (NH4)3PO4

• The Chemical formula of Ammonium phosphate: (NH4)3PO4

• It is the salt of Ammonia and Phosphoric acid

• Other names of this salt are Triammonium phosphate, Diazanium hydrogen phosphate.

• All other options are wrong

Q17. Answer: (d) Ovules

• The carpels(female) and stamens(male) are surrounded by petals.

• Carpel- One of the leaflike, seed-bearing structures that constitute the innermost whorl of a flower.

One or more carpels make up the pistil.

Fertilization of an egg within a carpel by a pollen grain from another flower results in seed development within the carpel.

Carpels, present in the centre of a flower, form the female reproductive part. It is surrounded by male reproductive structures called stamens.

• The petals are protected by sepals, which are green.

• The carpels are the female reproductive part of the flower. It is divided into three parts namely- ovary, style and stigma.

• The ovary contains ovules and the style acts as a passage for the pollen tubes carrying the male gametes.

• The stigma is the terminal part of the carpel which is receptive and it receives the pollen grains and provides nutrition for the growth and development of pollen tube which carries male gametes through style and reaches the ovules to fertilise an egg.

-

Q18. Answer: (b) complex permanent

Option 2 is correct:

• Complex permanent tissue: The complex tissues are made of more than one type of cells and these work together as a unit.

• Xylem and phloem constitute the complex tissues in plants.

• Xylem is one of the important tissues of the vascular system of plants. The main activity of this tissue is to transport minerals and water from roots and carry them to other parts of the plants. It has two separate chambers tracheids and vessels for transporting minerals and water.

• Phloem is also important as the xylem tissues for the vascular system of plants. The main activity of this tissue is to transport nutrients and food from leaves to other growing parts of plants.

Difference between Phloem and Xylem:-

Characteristic	Xylem	Phloem
Conduction	Water and minerals from the root to body parts	Prepared Food from leaves to body parts
Strength	Provides mechanical strength	Do not provide mechanical strength
Elements live	Xylem parenchyma only	Sieve tubes, companion cell and phloem parenchyma
Conduction direction	Unidirectional	Bidirectional
Conducting channel	Tracheids	Sieve tubes

Q19. Answer: (c) Vas deferens

Option 3 is correct:

• The human male reproductive system consist of the following organs:

Urethra	**• It is about 20 cm long tube that arises from the urinary bladder to carry urine. - It runs through the penis and opens to the outside through male genital pore. - The urethra carries urine from the bladder, as well as sperms from the vas deferens, through the penis.**
Penis	• The penis is a long and thick muscular organ made up of mostly erectile tissue. - The tip of the penis consists of a soft and highly sensitive glans penis, which is covered by a loose, retractable fold of skin called foreskin.

Vas deferens	• This is a straight tube, about 40 cm long, which carries the sperms to the seminal vesicles.
Scrotum	• The scrotum is a pouch of skin that hangs between the legs. It is divided internally into right and left scrotal sacs by a muscular partition. - The scrotum acts as thermoregulation and provides an optimal temperature for the formation of sperms. - During summers, when the temperature rises, the scrotum becomes relaxed to lose heat.

Q20. Answer: (a) Cochlea

The correct answer is option 1 i.e Cochlea

EAR:

• The ears perform two sensory functions one is hearing and other is maintenance of body balance.

• The ear can be divided into three major sections 1) the outer ear 2) the middle ear and 3) the inner ear.

• The fluid the filled inner ear is called the labyrinth, and the coiled portion of the labyrinth is called cochlea.

• The vibrations produced in the eardrum are transmitted through the ear ossicles and oval window to the fluid-filled inner ear.

• The inner ear also contains a complex system located above the cochlea called the vestibular apparatus.

• It is influenced by gravity and movements and helps us in maintaining the balance of the body and posture.

Q21. Answer: (d) 2 hours 30 min

Shortcut Trick

Use the constant distance formula: Distance = [S1 × S2 / (S2 − S1)] × Time Difference

Let original speed be S. Then, 1200 = [S × (S + 120) / 120] × 0.5

=> S(S + 120) = 1200 × 120 / 0.5 = 288000

=> S = 480 km/hr (since 480 × 600 = 288000). Original time = 1200 ÷ 480 = 2.5 hours.

Therefore The correct answer is 2 hr 30 min.

Alternate Method

Given: Distance = 1200 km, Speed increase = 120 km/hr, Time reduction = 30 min = 0.5 hr.

Formula: Time = Distance ÷ Speed

=> Let original speed = x km/hr

=> (1200 / x) − (1200 / (x + 120)) = 0.5

=> 1200 [(x + 120 − x) / (x(x + 120))] = 0.5

=> 1200 × 120 = 0.5 × (x^2 + 120x)

=> 288000 = x^2 + 120x => x^2 + 120x − 288000 = 0

=> (x + 600)(x − 480) = 0 => x = 480 km/hr

=> Duration = 1200 ÷ 480 = 2.5 hours = 2 hr 30 min

Therefore The correct answer is 2 hr 30 min.

Additional Information

Constant Distance Relation

When distance is constant, speed is inversely proportional to time (S prop. to 1/T). The product of speed and time remains the same.

Tailwind and Headwind

Tailwind increases the effective speed of the aircraft (V_(air) + V_(wind)), while headwind decreases it (V_(air) − V_(wind)).

Average Speed

Average Speed = Total Distance ÷ Total Time. For two equal distances at speeds a and b, Average Speed = 2ab / (a + b).

Q22. Answer: (b) 6840°

No. of hours between 2 am and 2 pm in a day = 12 hours

No. of hours between 2 pm and 9 pm in a day = 7 hours.

Therefore, total no. of hours between 2 am and 9 pm of the same day = 12 + 7 = 19 hours.

Angle rotated by a minute hand in 1 hour = 360°

Therefore, total rotation in 19 hours = 19 × 360° = 6840°

Hence, the correct answer is 6840°.

Q23. Answer: (b) (-13)/2

(3/11 × 33/6) - (9/4 × 12/3) + (5/11 × 22/10)

=> 3/2 – 9 + 1

=> (3 – 18 + 2)/2

=> (-13)/2

Q24. Answer: (d) Rs. 2,310

Shortcut Trick

Successive Ratios: 4% = 1/25 (25 → 26) and 8% = 2/25 (25 → 27)

Overall Ratio = (25 × 25) : (26 × 27) = 625 : 702

Interest Units = 702 − 625 = 77 units

Given 625 units = Rs. 18,750 => 1 unit = 30

Total Interest = 77 × 30 = Rs. 2,310

Therefore The correct answer is Rs. 2,310.

Alternate Method

Given: Principal (P) = Rs. 18,750, Rate 1 (R1) = 4%, Rate 2 (R2) = 8%, Time = 2 years.

Formula: Amount (A) = P × (1 + R1/100) × (1 + R2/100)

=> Amount (A) = 18,750 × (104/100) × (108/100)

=> A = 18,750 × (26/25) × (27/25)

=> A = (18,750 ÷ 625) × 26 × 27

=> A = 30 × 702 = Rs. 21,060

=> Compound Interest (CI) = A − P

=> CI = 21,060 − 18,750 = Rs. 2,310

Therefore The correct answer is Rs. 2,310.

Additional Information

Effective Rate for Variable Interest

If rates are R1 and R2, the net effective rate is R1 + R2 + (R1 × R2)/100. For 4% and 8%, Net Rate = 4 + 8 + (4 × 8)/100 = 12.32%.

Compound Interest Formula

For different rates every year: A = P(1 + R1/100)(1 + R2/100)...(1 + R_n/100). The total earning is always (A − P).

Successive Percentage Change

Compound interest is an application of successive percentage increase where the interest of the previous year is added to the principal for the next year.

Q25. Answer: (d) Iodine

Option 4 is correct:

• Halogen: The Group 17 elements are known as the halogens.

• They are reactive non-metals and are always found in compounds with other elements.

• Chlorine, bromine, and iodine are all halogens.

• The halogens become darker as you go down the group.

Fluorine	**Pale yellow**
Chlorine	Yellow-green
Bromine	Red-brown
Iodine	Shiny purple/Blackish Purple

Q26. Answer: (a) C

Hence, the correct answer is figure 1.

Q27. Answer: (a) 784 J

The correct answer is option 1 i.e 784 J

• The energy possessed by an object of mass at height will be Potential energy.

• The energy possessed by a body on account of its position, shape and size is called Potential energy.

YourMockTest.com — Free Study Material

Examples	Types of Energy
Water stored in a dam	Potential energy
A raised hammer	Potential energy
A compressed spring	Potential energy

• Potential Energy = mgh
• Potential Energy = 10 kg × 9.8 ms^(-2)× 8 m
• Potential Energy = 784 J

Q28. Answer: (c) 7200

Shortcut Trick

Identify the highest power of prime factors: 150 = 2 × 3 × 5², 144 = 2^4 × 3², 96 = 2^5 × 3.

LCM = 2^5 × 3² × 5²

=> 32 × 9 × 25 = 800 × 9 = 7200.

Therefore The correct answer is 7200.

Alternate Method

Given: Numbers are 96, 144, and 150.

Formula Used: LCM (Least Common Multiple) by Prime Factorization method.

=> Prime factorization of 96 = 2 × 2 × 2 × 2 × 2 × 3 = 2^5 × 3¹

=> Prime factorization of 144 = 2 × 2 × 2 × 2 × 3 × 3 = 2^4 × 3²

=> Prime factorization of 150 = 2 × 3 × 5 × 5 = 2¹ × 3¹ × 5²

=> LCM = Highest power of all primes present = 2^5 × 3² × 5²

=> LCM = 32 × 9 × 25 = 7200

Therefore The correct answer is 7200.

Additional Information

Relation between LCM and HCF

For two numbers a and b, the product of the numbers is equal to the product of their HCF and LCM: a × b = HCF(a, b) × LCM(a, b).

LCM of Fractions

LCM of fractions = (LCM of Numerators) ÷ (HCF of Denominators).

Least Common Multiple (LCM)

It is the smallest positive integer that is perfectly divisible by each of the given numbers.

Q29. Answer: (c) Saj

Option 3 is correct:

• Best Child Artist at 64th National Film Awards 2017:

Artist	Film
Adhish Praveen	Kunju Daivam
Saj	Noor Islam
Manohara	Railway Children

• Established in 1954.
• Directorate of film festivals comes under the Ministry of Information and Broadcasting
• The award is given for the best work in the film industry
• Two types of awards are awarded – Golden lotus award and Silver lotus award.
• Featured and Non- featured films certified by CBFC are eligible for this award.

Q30. Answer: (b) 21/12

Follow BODMAS rule to solve this question, as per the order given below:

Step-1: Parts of an equation enclosed in 'Brackets' must be solved first, and in the bracket,

Step-2: Any mathematical 'Of' or 'Exponent' must be solved next,

Step-3: Next, the parts of the equation that contain 'Division' and 'Multiplication' are calculated,

Step-4: Last but not least, the parts of the equation that contain 'Addition' and 'Subtraction' should be calculated.

=> (3/2 × 1/6) + (5/3 × 7/2) - (13/4 × 4/3)

=> 1/4 + 35/6 – 13/3

=> (3 + 70 – 52)/12

=> 21/12

Q31. Answer: (c) [figure]

Alligator and tortoise both are Reptiles

Hence, figure 3 is the correct answer.

*NOTE: This is a question from of official paper of RRC Group D, but we have made some improvements in this as the question asked was erroneous.

Q32. Answer: (d) 20 years

Let the present ages of two persons be x and y.

The sum of the present age of two person is seven times that of the difference between their ages.

x + y = 7 (x - y)

x + y = 7x - 7y

6x = 8y

x/y = 8/6

x/y = 4/3

x = 4

y = 3

let x and y be 4k and 3k (k is constant term)

After 5 years, the sum of their ages will become nine times that of the difference

4k + 5 + 3k + 5 = 9 {(4k + 5) - (3k + 5)}

7k + 10 = 36k + 45 - 27k - 45

2k = 10

K = 5

X = 4k = 4 × 5 = 20

Y = 3k = 3 × 5 = 15

Hence, elder person is 20 years old.

Hence, the correct answer is option 4.

Q33. Answer: (b) Buoyant Force

the correct answer is option 2 i.e Buoyant Force

Buoyant Force:

• It is the force that causes objects to float.

• It is the upward force applied by the fluid on the object or the body when an object is put in or submerged in the fluid.

• It is also known as the buoyant force.

• Buoyancy is the phenomenon due to Buoyant Force.

• The unit of the buoyant force is the Newton (N).

• The buoyant force depends upon the density of the fluid.

• Buoyancy is defined as an upward force exerted by any fluid when an object is immersed in it.

• The pressure is more on the bottom of the object than the top of the object as the pressure increases with depth.

• These forces acting on the body are called the Buoyant force.

• Upward pressure exerted by the fluid depends upon the density of a fluid.

• The formulae for Buoyant force (f)=ρgv.

• Where ρ is the density of the fluid, g is the gravity, and v is the volume of fluid displaced.

Name of the force	Description
Tension	It is the pulling force that is applied axially by a rope, cable, etc.

YourMockTest.com — Free Study Material

Thrust force	It is the force that pushes or accelerate the object in one direction. It is based on Newton's third law of motion
Pressure	It is defined as the force applied perpendicular to the surface of an object per unit area

Q34. Answer: (c) 4V

Shortcut Trick

Volume of a cuboid is directly proportional to its dimensions: V prop. to l × b × h.

Change in length = 2 times, Change in height = 2 times, Change in breadth = 1 time.

New Volume = 2 × 1 × 2 = 4 times the original volume.

New Volume = 4V.

Therefore The correct answer is 4V.

Alternate Method

Given:

Original length = l, Original breadth = b, Original height = h.

Original Volume (V) = l × b × h

New Dimensions:

=> New length (l') = 2l

=> New height (h') = 2h

=> New breadth (b') = b (remains same)

Calculations:

=> New Volume (V') = l' × b' × h'

=> V' = (2l) × b × (2h)

=> V' = 4 × (l × b × h)

=> V' = 4V

Therefore The correct answer is 4V.

Additional Information

Total Surface Area of Cuboid

The total area of all six faces is given by 2(lb + bh + hl).

Diagonal of a Cuboid

The length of the longest rod that can be placed in a cuboid is $\sqrt{(l^2 + b^2 + h^2)}$.

Lateral Surface Area

The area of the four walls of a room is given by 2h(l + b).

Q35. Answer: (a) Chandrashekar Kambar

The correct answer is option 1 i.e Chandrashekar Kambar

• Jnanpith recipient and Kannada literature Chandrashekhar Kambar (81) was elected as 44^(th) President of the Sahitya Akademi.

• The Sahitya Akademi was started by the GOI on 12 March 1954.

• Apart from 22 languages which are in listed in the constitution of India the Sahitya Akademi has recognized English and Rajasthani as languages in which the program can be implemented

• The Sahitya Akademi award amount is now Rs.100,000.

• The first Awards were given in 1955.

Q36. Answer: (a) Telangana Rashtra Samithi (TRS)

Option 1 is correct: Telangana Rashtra Samithi (TRS)

• The Telangana state was inaugurated formally on June 2^(nd) 2014.

• In the General Elections held in April 2014, Telangana Rashtra Samithi emerged victorious by winning 63 of the 119 seats and formed the government. Sri K Chandrashekar Rao was sworn in as the First Chief Minister of Telangana.

• The State Bird - Palapitta (Indian Roller or Blue Jay).

• The State Animal - Jinka (Deer).

• The State Tree - Jammi Chettu (Prosopis Cineraria).

• The State Flower - Tangedu (Tanner’s Cassia).

Capital	Hyderabad
District	33
Members of Parliament (MPs)	17
Members of Legislative Assembly (MLAs)	119

Q37. Answer: (c) Statement 1 and 2 together are sufficient

Shortcut Trick

Total 8 trolleys are present in the supermarket.

From Statement 1: 8 cans (2 per trolley) occupy 8 ÷ 2 = 4 trolleys.

From Statement 2: Remaining 8 − 4 = 4 trolleys contain 4 cans each = 16 cans.

Total cans = 8 (Statement 1) + 16 (Statement 2) = 24 cans.

Since both statements are required to find the total, they are together sufficient.

Therefore The correct answer is Statement 1 and 2 together are sufficient.

Alternate Method

Given:

Total trolleys in supermarket = 8

Statement 1: 8 cans fit as 2 cans per trolley.

Statement 2: Remaining trolleys have 4 cans each.

=> Number of trolleys used for first type = 8 ÷ 2 = 4 trolleys

=> Remaining number of trolleys = 8 − 4 = 4 trolleys

=> Cans in remaining trolleys = 4 × 4 = 16 cans

=> Total cans loaded = 8 + 16 = 24 cans

Both statements are required to reach a unique numerical value for the total number of cans.

Therefore The correct answer is Statement 1 and 2 together are sufficient.

Additional Information

Data Sufficiency Basics

In data sufficiency, you must determine if the provided information is necessary and enough to find a unique answer, even without calculating the final value.

Logical Distribution

Total Quantity = (Items per group1 × Groups1) + (Items per group2 × Groups2). Missing any one variable makes the total indeterminate.

Complementary Information

When a statement mentions the rest or remaining, it implies a dependency on the previous partition defined by other statements or the question stem.

Q38. Answer: (c) 11.6%

Shortcut Trick

Mass of Solute (Salt) = 42 g

Mass of Solvent (Water) = 320 g

Total Mass of Solution = 42 + 320 = 362 g

Concentration % = (42 ÷ 362) × 100 ≈ 11.6%

Therefore The correct answer is 11.6%.

Alternate Method

Given:

Mass of solute (salt) = 42 g

Mass of solvent (water) = 320 g

Formula Used:

Mass by mass percentage = [Mass of solute ÷ Mass of solution] × 100

Calculations:

=> Total mass of solution = Mass of salt + Mass of water

=> Total mass of solution = 42 g + 320 g = 362 g

YourMockTest.com – Free Study Material

=> Concentration % = (42 ÷ 362) × 100

=> Concentration % = 4200 ÷ 362

=> Concentration % ≈ 11.602%

Therefore The correct answer is 11.6%.

Additional Information

Mass by Volume Percentage

It is defined as the mass of solute dissolved in 100 mL of solution. Formula: (Mass of solute ÷ Volume of solution) × 100.

Saturated Solution

A solution in which no more solute can be dissolved at a specific temperature is called a saturated solution.

Solubility

The maximum amount of solute that can be dissolved in 100 g of solvent at a given temperature is its solubility.

Q39. Answer: (b) C_nH_(2n-2)

Option 2 is correct:

• Alkynes - The simplest alkyne—a hydrocarbon with carbon-to-carbon triple bond—has the molecular formula C2H_(2n-2) and is known by its common name—acetylene. Acetylene is used in oxyacetylene torches for cutting and welding metals.

• Eg.Propyne

Application:

C3H4 follows the general formula for a compound with n = 3

Hence C3H4 belongs to the alkyne family.

• Alkenes are unsaturated hydrocarbons that contain one or more double bonds. The general formula for Alkenes is CnH2n. Example: Ethylene (C2H4).

• Alkanes are saturated hydrocarbons that contain a single bond.

• The General Formula for Alkanes is CnH2n+2.

• Example: Ethane (C2H6)

Alkane	**C_nH_(2n+2)**
Alkene	C_nH_(2n)

Q40. Answer: (a) 5

Option 1 is correct: 5 Moles.

• One mole of Carbon dioxide contains One part Carbon, Two parts Oxygen.

• The Molar mass of carbon is 12 g and oxygen is 16 g.

• So 1 mole of CO2 weighs :

• (16*2)g = 32g for Oxygen, 12 g for carbon.

• The molar mass of CO2 is 32 + 12 = 44 g.

• The number of moles of CO2 in 220 g of CO2 is 220/44 = 5 moles.

Q41. Answer: (b) 66

Shortcut Trick

Total percentage is always 100%.

White balls = 45% → Black balls = 100% − 45% = 55%.

Number of black balls = 55% of 120 = 0.55 × 120 = 66.

Therefore The correct answer is 66.

Alternate Method

Given:

Total number of balls = 120

Percentage of white balls = 45%

Calculations:

=> Number of white balls = 45% of 120

=> White balls = (45 ÷ 100) × 120 = 0.45 × 120 = 54

=> Number of black balls = Total balls − White balls

=> Black balls = 120 − 54 = 66

Therefore The correct answer is 66.

Additional Information

Percentage Basics

To find the percentage of a quantity, use the formula: (Value ÷ Total) × 100.

Complementary Percentage

If a whole is divided into two parts A and B, then Percentage of B = 100% − Percentage of A.

Ratio Conversion

The ratio of white to black balls here is 45:55, which simplifies to 9:11.

Q42. Answer: (b) 96/5 days

Shortcut Trick

Let Total Work be LCM(32, 24, 8) = 96 units.

Efficiency of Prasid = 96 ÷ 32 = 3 units/day.

Efficiency of Deep = 96 ÷ 24 = 4 units/day.

Combined efficiency of Prasid + Deep + Niloy = 96 ÷ 8 = 12 units/day.

Efficiency of Niloy = 12 − (3 + 4) = 5 units/day.

Time taken by Niloy alone = 96 ÷ 5 days.

Therefore The correct answer is 96/5 days.

Alternate Method

Given: Time taken by Prasid = 32 days, Deep = 24 days, and All together = 8 days.

Formula Used: 1/T_(total) = 1/T1 + 1/T2 + 1/T3

Person	Days	Total Work	Efficiency
Prasid	32	96	3
Deep	24	4	
Prasid+Deep+Niloy	8	12	

=> Efficiency of Niloy = (Efficiency of All) − (Efficiency of Prasid + Efficiency of Deep)

=> Efficiency of Niloy = 12 − (3 + 4) = 5 units/day.

=> Time taken by Niloy alone = Total Work ÷ Efficiency of Niloy

=> Time taken = 96 ÷ 5 days.

Therefore The correct answer is 96/5 days.

Additional Information

Total Work Concept

Total work is usually assumed as the Least Common Multiple (LCM) of the individual days to make efficiency calculations into whole numbers.

Work and Wages

In problems involving wages, money is always distributed in the ratio of the efficiencies of the workers, provided they work for the same duration.

Inverse Relationship

Time taken to complete a work is inversely proportional to the efficiency of the person. Time = Work ÷ Efficiency.

Q43. Answer: (c) 24

Hence, total number of squares in the given figure are 24.

Q44. Answer: (d) Half potential energy and half kinetic energy.

The correct answer is option 4 i.e Half potential energy and half kinetic energy.

• Kinetic Energy: The energy required to change the state of a body from rest to motion is called

• Kinetic Energy = 1/2 mv^2.

• Potential energy: It is the energy possessed by a body due to its change in position or shape.

• Potential Energy: Mgh

• Law of conservation of energy: According to the law, energy can only be transformed from one form to another, energy can neither be created nor destroyed. It can only be transformed from one form to another.

• The total energy before and after the transformation remains constant.

• potential energy + kinetic energy = constant

• Mgh + 1/2mv² = constant

Q45. Answer: (c) Auxins

Option 1 is correct i.e Auxins.

• Auxins, Gibberellins, and Cytokinins are grouped into plant growth promoters while abscisic acid and ethylene are grouped into plant growth inhibitors.

• Auxins are the main hormones responsible for cell elongation in phototropism and gravitropism by promoting cell growth.

• Insulin- Insulin is a hormone made in the pancreas, a gland located behind your stomach. It allows your body to use glucose for energy.

Q46. Answer: (a) 3 to 12

The correct answer is option 1 i.e 3 to 12

• The d-block of the periodic table contains the elements of the groups 3-12.

• The d-block element is known as a transition element.

• There total of 4 blocks in the modern periodic table. They are as follows: s block, p block, d block, f block.

• There are 18 groups and 7 periods in the modern periodic table.

• Total elements are 118 out of which 92 are metals, 7 are metalloids, and 19 are non-metal.

Q47. Answer: (c) D

Except figure D, in all figures the stars are arranged in the consecutive manner.

Whereas in figure D, stars are arranged opposite to each other.

Hence, figure D is odd one out.

Q48. Answer: (c) 165

Shortcut Trick

Speed ratio (Usual : New) = 100 : (100 − 12) = 100 : 88 = 25 : 22.

Since distance is constant, Time ratio is inverse of Speed ratio = 22 : 25.

Difference in time ratio parts = 25 − 22 = 3 units → 18 minutes.

1 unit = 6 minutes => Usual time (22 units) = 132 minutes = 132/60 hours = 2.2 hours.

Distance = Usual Speed × Usual Time = 75 × 2.2 = 165 km.

Therefore The correct answer is 165 km.

Alternate Method

Given: Usual Speed (S1) = 75 km/hr, Speed decrease = 12%, Time difference (Δt) = 18 minutes = 18/60 hours.

Formula: Distance (D) = [S1 × S2 / (S1 − S2)] × Δt

=> New Speed (S2) = 75 × (88/100) = 66 km/hr.

=> Speed difference (S1 − S2) = 75 − 66 = 9 km/hr.

=> D = [75 × 66 / 9] × (18 / 60)

=> D = [550/1] × (3 / 10)

=> D = 165 km.

Therefore The correct answer is 165 km.

Additional Information

Inverse Proportionality Rule

When distance is constant, Speed (S) is inversely proportional to Time (T). If speed ratio is a:b, then time ratio is b:a.

Average Speed Formula

For two equal distances covered at speeds x and y, Average Speed = 2xy / (x + y).

Relative Speed

In the same direction, relative speed = S1 − S2. In the opposite direction, relative speed = S1 + S2.

Q49. Answer: (c) Only argument I is strong

Yes, a dress code will bring unity and eliminate discrimination. There will be no discrimination if all will wear the similar dress.

YourMockTest.com — Free Study Material

Q50. Answer: (d) March, April, September and December

Total number of sold books over the years (January to December) = 2000 + 1500 + 2500 + 3000 + 2000 + 1000 + 1500 + 2000 + 5000 + 2000 + 150 + 6000 = 28650

Required average = 28650/12 = 2387.5

In March, April, September and December he sold the more books than average sold books.

Q51. Answer: (b) Kotak Mahindra bank

Except Kotak Mahindra, all other are technical institutes.

Whereas 'Kotak Mahindra' is a bank.

Hence, 'Kotak Mahindra' is odd one out.

Q52. Answer: (c) B

The circular figure inside the rectangular figure is rotating in a clock wise manner,

Hence, the correct answer is figure B.

Q53. Answer: (d) Cousins

According to the given information,

Avant and the girl in the photograph are cousins.

Hence, the correct answer is 'Cousins'.

Q54. Answer: (d) Literature

Option 4 is correct: Literature

• Bharatiya Jnanpith is one of the premier literary organizations of India, which is nurturing literature and culture through its literary endeavours, which include Awards, Publication, Fellowship and Research for the last several decades.

• This was instituted in 1961 and is given only to Indian writers who write in Indian languages and English.

• Amitab Ghosh is honoured with the 54th Jnanpith Award for his contribution to English Literature and also became the 1st English language writer in the list as all previous winners of the prestigious award have been writers in Indian languages.

• Eminent Malayalam poet Akkitham Achuthan Namboothiri has been chosen for the 55th Jnanpith Award

Some important fact about Jnanpith Award,

• The winner is given a cash prize of Rs. 11 lakh and a bronze replica of Goddess Saraswati, the Hindu goddess of learning.

• The first recipient of the award was Malayalam writer G Sankara Kurup in 1965 for his novel 'Odakkuzhal' (The Bamboo Flute).

• The first woman writer to be awarded this award was Ashapoorna Devi, a Bengali writer, in 1976.

Q55. Answer: (a) Big investment in island nations

The correct answer is option 1 i.e Big investment in island nations

Key Points

• A quiet Maritime strategic diplomacy has emerged as the key theme of this year's Union Budget 2018-19, for a big investment in all island nations in the strategic Indian Ocean region.

• The beneficiaries island nation of the Budget is Seychelles, Mauritius, Sri Lanka, and the Maldives.

Country	Capital
Seychelles	Victoria
Mauritius	Port Louis
Sri Lanka	Sri Jayawardenepura Kotte
Maldives	Male

Q56. Answer: (d) WR

The pattern followed here is,

O + 2 = Q; Q + 2 = S; S + 2 = U; U + 2 = W;

V - 1 = U; U - 1 = T; T - 1 = S; S - 1 = R

Hence, 'WR' is the correct answer.

YourMockTest.com — Free Study Material

Q57. Answer: (c) 3.6 × 10^6 J

CONCEPT:

• Work done (W): When a force is applied on a body and there is a displacement of the body in the direction of force then the work is said to be done by the force.

• The SI unit of work is Joule.

• 1 Joule (J) = 1 Nm

Work (W) = Force (F) × Displacement (S)

• Power (P): The rate of work done is called power.

• The SI unit of power is the watt (W).

Power (P) = work done (W) / time (t) (P = W / t = J / s)

EXPLANATION:

Since 1 KW = 1000 W

1 hr = 3600s

1 K Wh = 1000 W × 3600s (w = j / s)

1 Kwh = 3.6 × 10^6 J

The correct answer is option 3.

Q58. Answer: (b) MS Dhoni

The correct answer is option 2 i.e MS Dhoni

• M.S. Dhoni inaugurated his first global cricket academy in UAE.

• The academy was jointly launched by the Dubai-based Pacific Sports Club and Aarka Sports Club.

• The coaches required in this academy will be from India.

UAE:

• Capital: Abu Dhabi

• Currency: United Arab Emirates dirham

Q59. Answer: (a) Only argument 2 is strong

1. Yes, the money can be used for the development of poor people. This argument is false.

Argument 2 is strong because Sports help athletes gain international exposure and plays a significant role in exposing talent.

Q60. Answer: (d) 2

Shortcut Trick

The required numbers are of the form LCM(35, 49) × k + 30, where k is a non-negative integer.

LCM of 35 and 49 is 245.

For k = 0, the number is 30 (not a multiple, but leaves remainder 30 when divided by 35 and 49).

For k = 1, the number is 245 + 30 = 275.

For k = 2, the number is 490 + 30 = 520 (greater than 500).

Therefore, the natural numbers less than 500 are 30 and 275, but since 30 < 35 and 30 < 49, it trivially leaves remainder 30.

Among the standard positive integers satisfying the divisor condition, 30 and 275 are the only two valid values.

Therefore The correct answer is 2.

Alternate Method

Let the required natural number be N.

According to the question, when N is divided by 35 and 49, the remainder is 30 in each case.

=> N = LCM(35, 49) × k + 30

To find the LCM of 35 and 49:

=> 35 = 5 × 7

=> 49 = 7^2

=> LCM(35, 49) = 5 × 7^2 = 5 × 49 = 245

Now, the general form of the number is:

=> N = 245 × k + 30, where k = 0, 1, 2, ...

We need to find the number of such natural numbers less than 500:

=> For k = 0: N = 245 × 0 + 30 = 30 (Since 30 is a positive integer, it is a natural number)

=> For k = 1: N = 245 × 1 + 30 = 275

=> For k = 2: N = 245 × 2 + 30 = 520 (which is greater than 500)

Thus, there are exactly 2 such natural numbers: 30 and 275.

Therefore The correct answer is 2.

Additional Information

Remainder Theorem & LCM

The smallest number which when divided by x, y, and z leaves a remainder r in each case is given by LCM(x, y, z) + r.

Natural Numbers definition

Natural numbers are positive integers starting from 1, 2, 3, ... etc. Since 30 is positive, it qualifies as a valid natural number under this condition.

Q61. Answer: (a) D

Except figure D, all other figures are showing water images for letters T, Z, and M.

Hence, figure D is odd one out.

Q62. Answer: (b) Momentum

The correct answer is option 2 i.e Momentum

• Momentum: It is defined as the quantity of motion of the body.

• It is measured by mass × velocity.

• Momentum depends on both speed and direction

• Momentum is a vector quantity as mass is scaler and velocity is vector

• Momentum = Mass X Velocity (p = mv).

• SI unit Kg-m.s-1

Q63. Answer: (c) North – East

According to the given information,

Varun's opponents Samarth will sit opposite to him.

Hence, the correct answer is North-East.

Q64. Answer: (c) poems

• Sangama literature is one of the main sources used for documenting the early history of the ancient Tamil country.

• The ancient Sangam poems mention numerous kings and princes, the existence of some of whom have been confirmed through archaeological evidence.

• The Sangam landscape is the name given to a poetic device that was characteristic of love poetry in classical Tamil Sangam literature. The core of the device was the categorisation of poems into different tinais.

• Each tinai was closely associated with a particular landscape, and imagery associated with that landscape—its flowers, trees, wildlife, people, climate and geography—was woven into the poem in such a way as to convey a mood

• In Tolkappiyam, there is a reference to the five-fold division of lands - Kurinji (hilly tracks), Mullai (pastoral), Marudam (agriculture).

• Silappadikaram and Manimekalai are epics of Tamil poetry.

• Silappadikaram is the story of Kovalan, Kannagi his wife, and Madhavi.

• Manimekalai is a Tamil Buddhist poem which gives information about the daughter of Kovalan and Madhavi.

Q65. Answer: (b) Hyderabad

The correct answer is option 2 i.e Hyderabad

• Wings India 2018 was hosted by Hyderabad.

• It was the four-day biennial event.

• It was jointly organized by Ministry of Civil Aviation, Airport Authority of India and FICCI

• The theme of the event was "India-Global Aviation Hub".

Q66. Answer: (b) 127

According to the given information,

Symbols	•	×	÷	•
Codes	×	•	•	÷

Given: 62 - 2 ÷ 8 + 15 × 4 + 6

After changing symbols according
62 ÷ 2 + 8 × 15 - 4 × 6
Now, solving the equation according to BODMAS rule,
= 31 + 8 × 15 - 4 × 6
= 31 + 120 - 24
= 151 - 24
= 127
Hence, the correct answer is 127.

Q67. Answer: (c) [figure]

All figures except figure 3 are folded in 90 degree angle.
Hence, the correct answer is option 3.

Q68. Answer: (a) 9,68,00

Total sale of all types of toys = 387200
The sales revenue earned on soft toys is = 25% of 387200 = 387200 × (25/100) = 9,68,00

Q69. Answer: (b) (√3 + 4)/2√3

Shortcut Trick
Given angle A = 60°, find sin(A/2) and cosec A separately.
sin(60°/2) = sin 30° = 1/2
cosec 60° = 1/sin 60° = 1/(√3/2) = 2/√3
Sum = 1/2 + 2/√3 = (√3 + 4)/(2√3)
Therefore The correct answer is (√3 + 4)/2√3.
Alternate Method
A (60°)
B
C (90°)
Expression: sin(A/2) + cosec A
Given: angle C = 90°, angle A = 60°
Formula Used: sin 30° = 1/2; cosec 60° = 2/√3
=> Required value = sin(60°/2) + cosec 60°
=> Required value = sin 30° + cosec 60°
=> Required value = (1/2) + (2/√3)
=> Taking LCM of 2 and √3 = 2√3
=> Result = (√3 + 2 × 2) / (2√3)
=> Result = (√3 + 4) / 2√3
Therefore The correct answer is (√3 + 4)/2√3.
Additional Information
Trigonometric Ratios of Specific Angles
Standard values: sin 30° = 1/2, sin 60° = √3/2, cos 30° = √3/2, cos 60° = 1/2.
Reciprocal Relations
cosec θ = 1 / sin θ and sec θ = 1 / cos θ.
Sum of Angles in a Triangle
In any triangle, angle A + angle B + angle C = 180°.

Q70. Answer: (b) 0

Given: Total customer = 50
Number of customer who like any of two brands
= B1 + B2 + C
= 25 + 20 + 5
= 50
Hence, all likes any of the two brands or both the brands.

So, number of customer who liked none of two brands

= Total customer - Number of customer who like any of two brands

= 50 - 50 = 0

Hence, the correct answer is "0".

Q71. Answer: (d) 6.25

The correct answer is option 4 i.e 6.25

The new reverse Repo rate announced by the Reserve Bank of India (RBI) as of 1st August 2018 was 6.25 %.

Rate	Description
Repo rate	It is the rate of interest which is levied on the short-term (2 - 90 days) loans taken by commercial banks from the Reserve Bank of India. Current Repo rate is - 5.15%
Reverse repo rate	It is the rate of interest at which Reserve Bank of India borrows the surplus funds with the commercial banks. Current Reverse repo rate is - 4.90%
MSF rate	It is the rate at which banks can borrow overnight from the Reserve Bank of India. This was introduced in the monetary policy of RBI for the year 2011-12 Current MSF rate is - 5.40%
Bank rate	It is the rate of interest levied on long-term (90 days - 1 year) loans and advances taken by commercial banks from the Reserve Bank of India Current Bank rate is - 5.40%

• The rate mentioned in the table are as per Dec 2019.

Q72. Answer: (c) 12

Shortcut Trick

For any expression of the form $a\,\text{cosec}^2\theta + b\,\sin^2\theta$, the minimum value is given by $2\sqrt{(ab)}$.

Here, a = 4 and b = 9.

=> Minimum value = $2 \times \sqrt{(4 \times 9)}$

=> Minimum value = $2 \times \sqrt{36} = 2 \times 6 = 12$.

Therefore The correct answer is 12.

Alternate Method

Expression: $4\,\text{cosec}^2\,2A + 9\,\sin^2\,2A$

a = 4

b = 9

Using AM ≥ GM for positive terms

Given: Expression $4\,\text{cosec}^2\,2A + 9\,\sin^2\,2A$, where $0° < A \leq 90°$.

Formula Used: Minimum value of $a\tan^2\theta + b\cot^2\theta$ or $a\sin^2\theta + b\,\text{cosec}^2\theta$ is $2\sqrt{ab}$.

=> Let $f(A) = 4\,\text{cosec}^2\,2A + 9\,\sin^2\,2A$

=> By Arithmetic Mean ≥ Geometric Mean (AM ≥ GM):

=> $[4\,\text{cosec}^2\,2A + 9\,\sin^2\,2A] / 2 \geq \sqrt{[4\,\text{cosec}^2\,2A \times 9\,\sin^2\,2A]}$

=> $4\,\text{cosec}^2\,2A + 9\,\sin^2\,2A \geq 2 \times \sqrt{[36 \times (\sin^2\,2A / \sin^2\,2A)]}$

=> $4\,\text{cosec}^2\,2A + 9\,\sin^2\,2A \geq 2 \times \sqrt{36}$

=> $4\,\text{cosec}^2\,2A + 9\,\sin^2\,2A \geq 2 \times 6 = 12$

Therefore The correct answer is 12.

Additional Information

Trigonometric Minimum Values

For $a\sin^2\theta + b\,\text{cosec}^2\theta$, the minimum value is $2\sqrt{ab}$ if $b \leq a$, otherwise it is $a + b$ (if considering a specific range where $\sin\theta$ cannot reach the extreme value).

Standard Form Results

The minimum value of $a\sec^2\theta + b\,\text{cosec}^2\theta$ is $(\sqrt{a} + \sqrt{b})^2$. The minimum value of $a\cos^2\theta + b\,\sec^2\theta$ is $2\sqrt{ab}$.

AM-GM Inequality

For any set of positive numbers, the Arithmetic Mean is always greater than or equal to the Geometric Mean (Equality holds when all numbers are equal).

YourMockTest.com — Free Study Material

Q73. Answer: (a) Badminton

The correct answer is option 1 i.e Badminton

• Kidambi Srikanth is an Indian badminton player.

• He was ranked no. 1 player in men's singles in the world in April 2018

• He was conferred with Padma Shri award in 2018

• He was also conferred with Arjuna award in 2015.

Q74. Answer: (c) 12

Shortcut Trick

Assume all 100 questions were correct: 100 × 4 = 400 marks.

Actual marks obtained = 340 marks.

Total marks lost due to incorrect answers = 400 − 340 = 60.

Marks lost for every wrong answer (penalty + missing correct marks) = 1 + 4 = 5 marks.

Number of wrongly answered questions = 60 ÷ 5 = 12.

Therefore The correct answer is 12.

Alternate Method

Given: Total questions = 100, Total score = 340, Correct = +4, Wrong = −1.

Average marks per question = 340 ÷ 100 = 3.4 marks.

=> Ratio of Correct to Wrong answers = 4.4 : 0.6

=> Ratio = 44 : 6 = 22 : 3

=> Total parts = 22 + 3 = 25 units

=> 25 units = 100 questions

=> 1 unit = 100 ÷ 25 = 4

=> Number of wrongly answered questions = 3 units × 4 = 12.

Therefore The correct answer is 12.

Additional Information

Equation Method

Let c be correct and w be wrong. c + w = Total, and (c × marks per correct) − (w × penalty) = Net Score.

Alligation in Scoring

The rule of alligation can be used when the average score per question is known to find the ratio of correct to incorrect responses.

Accuracy Rate

Accuracy % = (Number of correct answers ÷ Total attempted questions) × 100. In this case, (88/100) × 100 = 88%.

Q75. Answer: (d) B

The dotted figure is coincided in the complete figure and in the next step the dotted figure become complete figure.

Hence, figure B will be the next figure in the given set of figures.

Q76. Answer: (c) m = 9/8

Formula Used:

In a quadratic equation $ax^2 + bx + c = 0$

If α and β are the roots of the equation then

α + β (Sum of roots) = -b/a, α. β (Product of the roots) = c/a

Calculation:

Let the roots of the equation $(l – m)x^2 – (6l – 6m)x + 1 = 0$ be α and 2α.

if we compare the above equation by ax2 + bx + c = 0

we get a = (l – m), b = –(6l – 6m) and c = 1

Now, Sum of roots = -b/a,

Sum of roots (α + 2α) = – { – (6l – 6m)}/(l – m) = 6

=> α = 6/3 = 2 ----(1)

Given, l : α = 5 : 8

=> l = 5/4

Now, the Product of the roots = c/a

Product of the roots α × 2α = 1/(l – m)

=> 5/4 – m = 1/8

Therefore m = 9/8

Note: For this question, the discrepancy is found in the question/answer. So, This question is ignored for all candidates in the exam.

Q77. Answer: (a) 15

Shortcut Trick

To find the least number to be subtracted, find the remainder when 9999 is divided by 16.

9999 ÷ 16 => 16 × 600 = 9600; Remainder = 399.

16 × 24 = 384; Remainder = 399 − 384 = 15.

The remainder is the number to be subtracted.

Therefore The correct answer is 15.

Alternate Method

Given: Number = 9999, Divisor = 16.

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

Perform long division of 9999 by 16:

=> 99 ÷ 16 → Quotient = 6, Remainder = 3 (since 16 × 6 = 96)

=> Bring down 9: 39 ÷ 16 → Quotient = 2, Remainder = 7 (since 16 × 2 = 32)

=> Bring down 9: 79 ÷ 16 → Quotient = 4, Remainder = 15 (since 16 × 4 = 64)

=> Total Quotient = 624 and Remainder = 15.

=> Required number to subtract = Remainder = 15.

Therefore The correct answer is 15.

Additional Information

Divisibility by 16

A number is divisible by 16 if the number formed by its last four digits is divisible by 16.

Least Number to be Added

To make a number perfectly divisible by adding, the value to be added is (Divisor − Remainder).

Division Algorithm

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

Q78. Answer: (b) Eagle

The logic followed here is:

Peacock, Ostrich and Hen are more or less flightless birds whereas Eagle can fly even at a high altitude.

Hence, ‘Eagle’ is odd one out.

Q79. Answer: (b) Meghalaya

The correct answer is option 2 i.e Meghalaya

• Shillong is the capital of Meghalaya.

• The State of Meghalaya is situated in the northeast of India.

• The emergence of Meghalaya as an Autonomous State on 2nd April 1970 and as a full-fledged State on 21st January 1972.

State	Capital
Tripura	Agartala
Meghalaya	Shillong
Nagaland	Kohima
Assam	Dispur

Q80. Answer: (d) Rs. 750

Shortcut Trick

Convert 4 years 9 months into years: 4 + 9/12 = 4.75 years.

Total interest percentage = Rate × Time = 8% × 4.75 = 38%.

Total amount percentage = Principal (100%) + Interest (38%) = 138%.

Given 138% = Rs. 1,035 => 100% = (1,035 ÷ 138) × 100 = 7.5 × 100 = Rs. 750.

Therefore The correct answer is Rs. 750.

Alternate Method

Given: Amount (A) = Rs. 1,035 | Rate (R) = 8% p.a. | Time (T) = 4 years 9 months

Formula Used: Amount (A) = Principal (P) + Simple Interest (SI) = P × (1 + (R × T) ÷ 100)

=> Convert Time to years: T = 4 + 9/12 = 4 + 3/4 = 19/4 years = 4.75 years

=> 1,035 = P × (1 + (8 × 19/4) ÷ 100)

=> 1,035 = P × (1 + (2 × 19) ÷ 100)

=> 1,035 = P × (1 + 38 ÷ 100)

=> 1,035 = P × (1.38)

=> P = 1,035 ÷ 1.38

=> P = Rs. 750

Therefore The correct answer is Rs. 750.

Additional Information

Simple Interest Formula

SI = (P × R × T) ÷ 100, where P is the Principal, R is the Rate per annum, and T is Time in years.

Effective Interest Rate

The total interest earned on the Principal can be represented as (R × T)%, which helps in solving Amount-based questions directly.

Time Conversion

Always ensure Time is in years; if given in months, divide by 12; if in days, divide by 365.

Q81. Answer: (a) P

The correct answer is option 1 i.e P

Key Points

• Atomic radii- The distance from the centre of the nucleus to the outermost shell containing electrons called the atomic radius.

• While moving left to right across a period in the periodic table, the atomic number increases.

• Due to this the effective nuclear charge also increases.

• This is because the nucleus pull is high for the electrons,

• From right to left in the periodic table the atomic radius increase.

• As Ar is the 18 group element, Cl is the 17 group element, S is the 16 group element, and P is the 15 group element so P has the largest- size ions among these elements.

Name	Formula	Atomic number
Phosphorous	P	15
Chlorine	Cl	17
Argon	Ar	18
sulphur	S	16

Q82. Answer: (c) Mass × Velocity

The correct answer is option 3 i.e Mass × Velocity

• Momentum: It is defined as the quantity of motion of the body.

• It is measured by mass × velocity.

• Momentum depends on both speed and direction

• Momentum is a vector quantity as mass is scaler and velocity is vector

• Momentum = Mass X Velocity (p=mv).

• SI unit Kg-m.s^-1

Q83. Answer: (a) Only A is true

The correct answer is option 1 i.e Only A is true

• Sound is produced by vibrating objects.

• Medium: It is the matter or substance through which sound is transmitted.

• It can be solid, liquid or gas

• Speed of sound in a different medium at 25ºC

Metal/Non-metals	Speed
Aluminium	6420 m/s
Nickel	6040 m/s
Steel	5960 m/s
Brass	4700 m/s
Iron	5950 m/s
Glass	3980 m/s

Q84. Answer: (b) Lok Janshakti Party

The correct answer is option 2 i.e Lok Janshakti Party

• The Lok Jan Shakti Party (LJP) is a premier Indian political organization formed on 28th October 2000 and led by the Honourable Shri Ram Vilas Paswan.

• The party was formed after the separation from the Janata Dal (United).

• The party has considerable amongst Dalits in Bihar.

Lok Janshakti Party:

• Leader: Ram Vilas Paswan

• Founder: Ram Vilas Paswan

• Founded: November 2000

Q85. Answer: (a) Metal oxide + acid ? salt + water

The correct answer is option 1 i.e Metal oxide + acid ? salt + water

Key Points

• Metal oxides are basic in nature.

• When an acid reacts with a metal oxide they both neutralize each other.

• The new compounds formed are salt and water.

Acid + Metal Oxide ? Salt + Water

• Example: Calcium is metal and calcium oxide is a metallic oxide which is basic in nature.

• When an acid (hydrochloric acid) reacts with calcium oxide, a neutralization reaction takes place and calcium chloride along with water is formed.

2HCl + CaO ? CaCl2 + H2O

Q86. Answer: (d) 0.11

Shortcut Trick

The expression follows the algebraic identity pattern: $(a^3 - b^3) / (a^2 + ab + b^2) = (a - b)$.

Identify a = 0.22 and b = 0.11.

Verify denominators: $a^2 = 0.0484$, $ab = 0.0242$, and $b^2 = 0.0121$.

Final Value = a − b = 0.22 − 0.11 = 0.11.

Therefore The correct answer is 0.11.

Alternate Method

Given:

Expression = $((0.22)^3 - (0.11)^3) / (0.0484 + 0.0242 + 0.0121)$

Formula Used:

The difference of cubes identity is: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Calculation:

=> Let a = 0.22 and b = 0.11.

=> Calculate $a^2 = (0.22) \times (0.22) = 0.0484$.

=> Calculate $b^2 = (0.11) \times (0.11) = 0.0121$.

=> Calculate $ab = (0.22) \times (0.11) = 0.0242$.

=> We can see the denominator is (0.0484 + 0.0242 + 0.0121) = (a^2 + ab + b^2).

=> Substituting these into the expression: [(a − b)(a^2 + ab + b^2)] / (a^2 + ab + b^2).

=> Expression = a − b.

=> Expression = 0.22 − 0.11 = 0.11.

Therefore The correct answer is 0.11.

Additional Information

Sum of Cubes Identity

The formula for the sum of two cubes is $a^3 + b^3 = (a + b)(a^2 − ab + b^2)$.

Difference of Squares

One of the most used identities in simplification is $a^2 − b^2 = (a − b)(a + b)$.

BODMAS Rule

Always follow the order: Brackets, Orders (powers/roots), Division, Multiplication, Addition, and Subtraction for multi-step calculations.

Q87. Answer: (a) 4x – 5

Shortcut Trick

By the Factor Theorem, if (x − 1) is a factor, then the sum of coefficients 4 + k + 5 = 0 => k = −9.

The expression becomes $4x^2 − 9x + 5$.

Let the factors be (x − 1) and (ax + b). Comparing the constant term: (−1) × b = 5 => b = −5.

Comparing the leading coefficient: (1) × a = 4 => a = 4.

The other factor is 4x − 5.

Therefore The correct answer is 4x − 5.

Alternate Method

Given: The polynomial $f(x) = 4x^2 + kx + 5$ is divisible by (x − 1).

Formula: According to the Remainder Theorem, if f(x) is divisible by (x − a), then f(a) = 0.

=> $f(1) = 4(1)^2 + k(1) + 5 = 0$

=> 4 + k + 5 = 0

=> 9 + k = 0

=> k = −9

Now, substitute the value of k back into the original expression:

=> $f(x) = 4x^2 − 9x + 5$

Factorize the quadratic expression by splitting the middle term:

=> $f(x) = 4x^2 − 4x − 5x + 5$

=> f(x) = 4x(x − 1) − 5(x − 1)

=> f(x) = (x − 1)(4x − 5)

The factors of the expression are (x − 1) and (4x − 5).

Therefore The correct answer is 4x − 5.

Additional Information

Factor Theorem

A polynomial f(x) has a factor (x − a) if and only if f(a) = 0. This is used to find unknown coefficients.

Remainder Theorem

When a polynomial f(x) is divided by (ax − b), the remainder is given by f(b/a).

Relationship between Roots and Coefficients

For a quadratic equation $ax^2 + bx + c = 0$, the product of roots is c/a and the sum of roots is −b/a.

Splitting the Middle Term

To factorize $ax^2 + bx + c$, find two numbers that multiply to (a × c) and add to b.

Q88. Answer: (a) Bhartruhari Mahtab

The correct answer is option 1 i.e Bhartruhari Mahtab

Outstanding Parliamentarian Award:

• This award was instituted by Indian Parliamentary Group (IPG) and was given annually since 1995.

• This award is given to the most Outstanding Parliamentarians selected by the Award Committee.

• The President of India, Shri Ram Nath Kovind, presented the Outstanding Parliamentarian Award for the years 2013-2017, on August 1, 2018, in New Delhi.

Outstanding Parliamentarian Award 2013-2017

2013	**Former Rajya Sabha member Najma Heptulla**
2014	Lok Sabha member Hukumdev Narayan Yadav
2015	Rajya Sabha member Ghulam Nabi Azad
2016	Lok Sabha member Dinesh Trivedi
2017	Lok Sabha member Bhartruhari Mahtab

Q89. Answer: (a) 32, 16

Shortcut Trick

Ratio 10 years ago = 11 : 3 (Difference = 8 parts)

Ratio 10 years hence = 21 : 13 (Difference = 8 parts)

As the ratio difference is same, increase in parts = 21 − 11 = 10 units.

Actual time gap = 10 + 10 = 20 years => 10 units = 20 years => 1 unit = 2 years.

Present ages = (11 × 2 + 10) and (3 × 2 + 10) = 32 and 16 years.

Therefore The correct answer is 32, 16 years.

Alternate Method

Given:

Ratio (F : S) 10 years ago = 11 : 3

Ratio (F : S) 10 years hence = 21 : 13

Formula Used:

If ratio is a : b, ages can be taken as ax and bx. Present age = Age at time T + T.

10 Yrs Ago 11 : 3 Present (P) 10 Yrs Hence 21 : 13 Gap = 20 Years

Calculations:

Let the ages of father and son 10 years ago be 11x and 3x.

=> Present ages = (11x + 10) and (3x + 10)

=> Ages after 10 years from now = (11x + 10 + 10) and (3x + 10 + 10)

=> According to question: (11x + 20) ÷ (3x + 20) = 21 ÷ 13

=> 13 × (11x + 20) = 21 × (3x + 20)

=> 143x + 260 = 63x + 420

=> 143x − 63x = 420 − 260

=> 80x = 160

=> x = 2

=> Present age of Father = 11(2) + 10 = 22 + 10 = 32 years.

=> Present age of Son = 3(2) + 10 = 6 + 10 = 16 years.

Therefore The correct answer is 32, 16 years.

Additional Information

Constant Age Difference

The difference between the ages of two people remains constant throughout their lives, regardless of the number of years passed.

Ratio Normalization

To solve age problems quickly, ensure the difference between ratio terms (e.g., |a−b|) is the same for both time periods by multiplying with suitable factors.

Time Calculation

Total time interval between T years ago and T years hence is always T + T = 2T years.

Q90. Answer: (a) Diamond

The correct answer is option 1 i.e Diamond

• Melting Point- The melting point is usually defined as the point at which materials change from a solid to a liquid.

• Boiling Point- It is the temperature at which the vapour pressure of the liquid becomes equal to the atmospheric pressure of the liquid's environment. At this temperature, the liquid is converted into a vapour.

• Diamond is made up of carbon-carbon covalent bonds.
• A lot of thermal energy is required to break a covalent bond
• This makes the diamond's melting point and boiling point very high.

Q91. Answer: (a) exactly 100

Shortcut Trick

Total student-subject interactions = Total Students × Subjects per Student

Total interactions = 1300 × 5 = 6500

Number of subjects = Total interactions ÷ Students per Subject

Number of subjects = 6500 ÷ 65 = 100

Therefore The correct answer is 100.

Alternate Method

Given:

Total number of students = 1300

Number of subjects each student reads = 5

Number of students reading each subject = 65

Formula Used:

The total number of reading assignments must be consistent: (Total Students × Subjects per Student) = (Total Subjects × Students per Subject)

Calculations:

Let the total number of subjects be S.

=> Total workload = 1300 × 5

=> Total workload = 6500

=> Since each subject is read by 65 students, we have: S × 65 = 6500

=> S = 6500 ÷ 65

=> S = 100

Therefore The correct answer is 100.

Additional Information

Double Counting Principle

This problem uses the Double Counting Principle (or Counting in Two Ways), which states that if you count a set in two different ways, the result must be the same.

Bipartite Graph Analogy

In graph theory, this is like a Bipartite Graph where edges connect students to subjects. The total number of edges is equal to the sum of degrees of vertices in either set.

Direct Variation

The total units of "reading" is constant for a given configuration, creating an inverse relationship between the number of subjects and the number of students per subject.

Q92. Answer: (a) Rs. 9,07,000

Total revenue of the company = 36,28,000

Total revenue made on sales of wallets and belts = (5% + 20%) of 36,28,000 = 25% of 36,28,00 = 36,28,000 × (25/100) = 9,07,000

Q93. Answer: (d) HCL Infosystems Ltd.

The correct answer is option 4 i.e HCL Infosystems Ltd.

• HCL Infosystems appointed Rangarajan Raghavan as the new Director and MD of the company.
• He succeeded Premkumar Seshadri as he has resigned from his post.

HCL Infosystems Ltd.

• Headquarters: Noida
• Founder: Shiv Nadar

Q94. Answer: (d) Lahore

The correct answer is option 4 i.e Lahore

• The Indian National Congress, on 19 December 1929, passed ‘Purna Swaraj’ means total independence resolution at its Lahore

session*.*

• In the same session, Jawaharlal Nehru was elected as president of the Congress.

• It was announced publically on 26 January 1930.

• Nehru marched to the banks of Ravi with the Congress members and they took an oath not to rest until Purna Swaraj was achieved.

• On December 21, 1929, the Tiranga (tricolour) flag was unfurled.

• The first Independence Day was celebrated on January 26, 1930

Q95. Answer: (b) Sagar Baheti

The correct answer is option 2 i.e Sagar Baheti

• Sagar Baheti has become the first visually impaired Indian runner to complete the historic Boston Marathon in 2017

• He was also the first Indian runner, who participate in the Boston Marathon.

• He completed 42.16 km in 4 hours.

Boston Marathon:

• It is the world's hardest and one of the oldest and competitive marathon.

• Boston, US hosts the marathon every year.

• It is one of the 6 major marathons which are held throughout the world.

Q96. Answer: (c) Fundamental duties

Option 3 is correct i.e Fundamental duties

• Fundamental duties of citizens were added to the constitution by the 42nd Amendment in 1976.

• This was done on the recommendations of the Swaran Singh Committee.

• India borrowed the concept of Fundamental Duties from the USSR (Russia).

• These duties set out in Part IV-A, Article 51(A) of the Constitution.

Amendment Procedure	Constitution of South Africa, Article 368
Fundamental Rights	Constitution of the USA, Article 12 to 35
Directive Principal	Constitution of Ireland, Article 36 to 51

Q97. Answer: (d) DCFD

In a certain coding language,

Similarly,

Hence, the correct answer is ‘DCFD’.

Q98. Answer: (a) They are multi-cellular and composed of epithelial tissues

Option 1 is correct, i.e. They are multi-cellular and composed of epithelial tissues.

Rhizoids:

• They are simple, hair-like projections.

• They grow from the epidermal cells of bryophytes.

• Bryophyte: It refers to the group of plants which includes mosses, liverworts, and hornworts.

• They are like root hairs which are found in complex vascular plants

• They are formed from single cells, unlike roots, which are multicellular organs

Q99. Answer: (a) Positive phototropism

Option 1 is correct:

• Phototropism is the ability of a plant or other photosynthesizing organism, to grow directionally in response to a light source.

• Plant and other autotrophs need to manufacture their own food; they usually do this through photosynthesis.

• Through photosynthesis, organisms convert water, carbon dioxide (CO_2) and light into sugar, which is used for energy and growth.

• Plants can not move around to acquire what they need, so in order to maximize the amount of light that they receive through the leaves, they use phototropism.

• Positive phototropism is the response of a plant toward a light source, while negative phototropism causes growth in the opposite direction.

• If the plant parts i.e. stem moves towards the light, show positive tropism. And if the plant part that is root moves away from light,

then it shows negative tropism.

Q100. Answer: (b) Both 1 and 2 follows.

The least possible Venn diagram is as follows,

Conclusions:

1. All gadgets are chips – True (all gadgets are electronic, All electronics are chips, hence, all gadgets are chips)
2. Some chips are electronics. – True (electronic exist in some part of chips and it is definite)

Hence, both conclusions I and II follows.

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

YourMockTest.com — Free Study Material