

ARITHMETIC

1. What is the value of

$$2 + \sqrt{2} + \frac{1}{2 + \sqrt{2}} - \frac{1}{2 - \sqrt{2}} ?$$

- (a) 2 (b) $2 - \sqrt{2}$
 (c) $4 + \sqrt{2}$ (d) $2\sqrt{2}$

2. What is the value of
- $1.\overline{34} + 4.\overline{12}$
- ?

- (a) $\frac{133}{90}$ (b) $\frac{371}{90}$
 (c) $5\frac{219}{990}$ (d) $5\frac{461}{990}$

3. A sum of money is divided among A, B, C and D in the ratio 3 : 5 : 8 : 9 respectively. If the share of D is ₹ 1,872 more than the share of A, then what is the total amount of money of B & C together?

- (a) ₹ 4,156 (b) ₹ 4,165
 (c) ₹ 4,056 (d) ₹ 4,068

4. What approximate compound interest can be obtained on an amount of ₹ 3,980 after 2 years at 8 p.c.p.a. ?

- (a) 650 (b) 680
 (c) 600 (d) 662

5. A man walks at the speed of 5 km/hr and runs at the speed of 10 km/hr. How much time will the man require to cover the distance of 28 km, if he covers half (first 14 km) of his journey walking and half of his journey running ?

- (a) 8.4 hrs (b) 6 hrs
 (c) 5 hrs (d) 4.2 hrs

6. In a 30 litres mixture of water and milk, 50% is milk. How much pure milk need to be added to this mixture to make mixture 30% water?

- (a) 10 litres (b) 18 litres
 (c) 15 litres (d) 20 litres

7. A bag contains 5 green and 7 red balls. Two balls are drawn. The probability that one is green and the other is red is

- (a) $\frac{5}{132}$ (b) $\frac{7}{132}$
 (c) $\frac{35}{66}$ (d) $\frac{31}{66}$

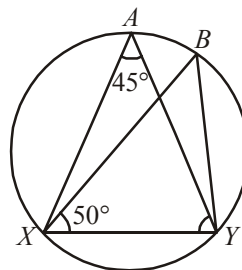
8. By selling 8 dozen pencils, a shopkeeper gains the selling price of 1 dozen pencils. What is the gain?

- (a) $12\frac{1}{2}\%$ (b) $13\frac{1}{7}\%$
 (c) $14\frac{2}{7}\%$ (d) $87\frac{1}{2}\%$

9. Two houses are collinear with the base of a tower and are at distance 3 m and 12 m from the base of the tower. The angles of elevation from these two houses of the top of the tower are complementary. What is the height of the tower?

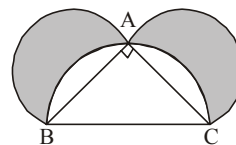
- (a) 4m (b) 6m
 (c) 7.5m (d) 36m

- 10.

In the figure given above, what is $\angle BYX$ equal to?

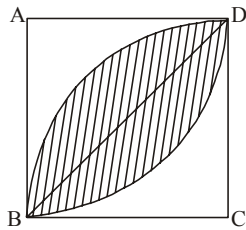
- (a) 85° (b) 50°
 (c) 45° (d) 90°

11. In the given figure,
- $\triangle ABC$
- is a right angled triangle, right angled at A. Semi-circles are drawn on the sides AB, BC and AC. Then, the area of shaded portion is equal to which one of the following?



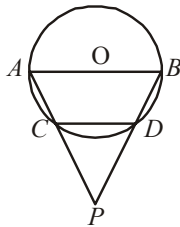
- (a) Area of DABC
 (b) 2 times the area of DABC
 (c) Area of semi-circle ABC
 (d) None of the above

12. In the given figure, the side of square ABCD is 7 cm. What is the area of the shaded portion, formed by the arcs BD of the circles with centre at C and A?



- (a) 7 cm^2 (b) 28 cm^2
(c) 14 cm^2 (d) 21 cm^2

13. In the figure given below $AO = CD$, where O is the centre of the circle. What is the value of $\angle APB$?



- (a) 60° (b) 50°
(c) 45° (d) 30°
14. The length of a line segment AB is 2 unit. It is divided into two parts at the point C such that $AC^2 = AB \times CB$. What is the length of CB ?
- (a) $3\sqrt{2}$ units (b) $3 - \sqrt{5}$ units
(c) $2 - \sqrt{5}$ units (d) $\sqrt{3}$ units
15. If $\frac{37}{13} = 2 + \frac{1}{x + \frac{1}{y + \frac{1}{z}}}$

where x, y, z are natural numbers, then what is z equal to?

- (a) 1
(b) 2
(c) 3
(d) Cannot be determined due to insufficient data
16. What is $27 \times 1.\bar{2} \times 5.52\bar{6}2 \times 0.\bar{6}$ equal to?
- (a) $121.\bar{57}$ (b) $121.\bar{75}$
(c) $121.\bar{75}$ (d) None of these

DIRECTIONS (Q. 17): What should come in place of the question mark (?) in the following questions?

17. $8^{9.4} \times 4^{12.8} \times 64^{8.1} = 16^?$
- (a) 41.8 (b) 16.2
(c) 18.4 (d) 25.6

18. If $\tan x = \frac{3}{4}$, where $0^\circ < x < 90^\circ$, then what is the value of $\sin x \cos x$?

- (a) $\frac{3}{5}$ (b) $\frac{4}{5}$
(c) $\frac{12}{25}$ (d) $\frac{13}{25}$

19. If $\frac{\cos x}{1 + \operatorname{cosec} x} + \frac{\cos x}{\operatorname{cosec} x - 1} = 2$, then which one of the following is one of the values of x ?

- (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$
(c) $\frac{\pi}{4}$ (d) $\frac{\pi}{6}$

20. If α and β are the roots of $ax^2 + bx + c = 0$, then

what is the value of $\left(\frac{1}{\alpha^2} - \frac{1}{\beta^2}\right)^2$?

- (a) $\frac{b^2(b^2 - 4ac)}{c^4}$ (b) $\frac{b(b^2 - 4ac)}{c^2}$
(c) $\frac{(b^2 - 4ac)}{c^2}$ (d) $\frac{(b^2 - 4ac)}{c^4}$

DIRECTIONS (Q. 21 - 23): Study the following table carefully in answer the questions that follow :

Number of Executives recruited by Six different organisations over the years

Organisation	P	Q	R	S	T	U
2004	458	512	418	502	476	492
2005	522	536	472	500	482	523
2006	480	495	464	508	488	518
2007	506	505	428	444	490	534
2008	427	485	422	512	510	498
2009	492	488	444	499	512	510

21. What is the total number of Executives recruited by all the organisations together in the year 2006?
- (a) 2927 (b) 3042
(c) 2864 (d) 2953
22. What is the ratio of the total number of Executives recruited by organisation U in the years 2007 and 2009 together to the total number of Executives recruited by organisation P in the same years?
- (a) 436 : 517 (b) 499 : 522
(c) 517 : 436 (d) 522 : 499

23. What is the average number of Executives recruited by organisation S over all the years together? (rounded off to the nearest integer)
- (a) 494 (b) 482
(c) 514 (d) 506
24. A hollow cylindrical iron pipe of length 1.4 m has base radius 2.5 cm and thickness of the metal is 1 cm. What is the volume of the iron used in the pipe?
- (a) 2640 cu cm (b) 2604 cu cm
(c) 2460 cu cm (d) None of these
25. A solid metallic cube of edge 4 cm is melted and recast into solid cubes of edge 1 cm. If x is the surface area of the melted cube and y is the total surface area of all the cubes recast, then what is $x : y$?
- (a) 2 : 1 (b) 1 : 2
(c) 1 : 4 (d) 4 : 1
26. If *381 is divisible by 11, then the digit at the place of * is :
- (a) 0 (b) 1
(c) 4 (d) 7
27. $\frac{\sqrt{1156}}{\sqrt{289}} = \frac{?}{12.5}$
- (a) 24 (b) 25
(c) 23 (d) 22
28. Product of two co-prime numbers is 117. Their L.C.M. should be:
- (a) 1
(b) 117
(c) equal to their H.C.F.
(d) cannot be calculated
29. The average of four consecutive odd numbers is 36. What is the smallest of these numbers ?
- (a) 31 (b) 35
(c) 43 (d) None of these
30. By selling 33 metres of cloth, a man gains the sale price of 11 metres. The gain % is
- (a) 50% (b) 25%
(c) $33\frac{1}{3}\%$ (d) 20%
31. Ninad, Vikas and Manav enter into a partnership. Ninad invests some amount at the beginning. Vikas invests double the amount after 6 months and Manav invests thrice the amount invested by Ninad after 8 months. They earn a profit of ₹45,000 at the end of the year. What is Manav's share in the profit?
- (a) ₹25,000 (b) ₹15,000
(c) ₹12,000 (d) ₹9,000
32. 40 men can cut 60 trees in 8 hrs. If 8 men leave the job how many trees will be cut in 12 hours ?
- (a) 72 (b) 60
(c) 48 (d) 36
33. A monkey ascends a greased pole 12 metres high. He ascends 2 metres in first minute and slips down 1 metre in the alternate minute. In which minute, he reaches the top ?
- (a) 21st (b) 22nd
(c) 23rd (d) 24th
34. A circular grass lawn of 35 metres in radius has a path 7 metres wide running around it on the outside. Find the area of path.
- (a) 1694m^2 (b) 1700m^2
(c) 1598m^2 (d) None of these
35. The cost price of 20 articles is equal to the selling price of 25 articles. The loss percent in the transaction is
- (a) 5 (b) 20
(c) 25 (d) 30
36. 10 horses and 15 cows eat grass of 5 acres in a certain time. How many acres will feed 15 horses and 10 cows for the same time, supposing a horse eats as much as 2 cows ?
- (a) $40/7$ acres (b) $39/8$ acres
(c) $40/11$ acres (d) $25/9$ acres
37. A car travels 25 km an hour faster than a bus for a journey of 500 km. If the bus takes 10 hours more than the car, then the speeds of the bus and the car are
- (a) 25 km/h and 40 km/h respectively
(b) 25 km/h and 60 km/h respectively
(c) 25 km/h and 50 km/h respectively
(d) None of these
38. If $x : y = 3 : 4$, then $(7x + 3y) : (7x - 3y)$ is equal to :
- (a) 5 : 2 (b) 4 : 3
(c) 11 : 3 (d) 37 : 19
39. If $x + \frac{1}{x} = \sqrt{3}$, then the value of $x^{18} + x^{12} + x^6 + 1$ is
- (a) 0 (b) 1
(c) 2 (d) 3
40. If $\frac{\tan \theta + \cot \theta}{\tan \theta - \cot \theta} = 2$, ($0 \leq \theta \leq 90^\circ$), then the value of $\sin \theta$ is
- (a) $\frac{2}{\sqrt{3}}$ (b) $\frac{\sqrt{3}}{2}$
(c) $\frac{1}{2}$ (d) 1

GENERAL INTELLIGENCE & REASONING

DIRECTIONS (Qs. 41-43) : In questions, select the related word/letters/number from given alternatives.

41. ACE : FHJ :: OQS : ?
 (a) TVX (b) UWY (c) PRT (d) RTU
42. Saint : Meditation :: Scientist : ?
 (a) Research (b) Knowledge
 (c) Spiritual (d) Rational
43. 18 : 5 :: 12 : ?
 (a) 4 (b) 10 (c) 3 (d) 6

DIRECTIONS (Qs. 44 - 45) : In questions, find the odd word/letters/number pair from the given alternatives.

44. (a) Kolkata (b) Vishakhapatnam
 (c) Bengaluru (d) Haldia
45. (a) HGFE (b) PONM
 (c) DCBA (d) MSTU

DIRECTIONS (Qs. 46-47) : In questions below, a series is given with one term missing. Choose the correct alternative from the given ones that will complete the series.

46. FAG, GAF, HAI, IAH, _____
 (a) JAK (b) HAK (c) JAI (d) HAL
47. 3, 6, 9, 15, 24, 39, 63, ?
 (a) 100 (b) 87 (c) 102 (d) 99
48. If A = 1, AGE = 13, then CAR = ?
 (a) 19 (b) 20 (c) 21 (d) 22
49. Arrange the following words as per order in the dictionary:
 1. Emplane 2. Empower
 3. Embrace 4. Elocution
 5. Equable
 (a) 5, 1, 3, 2, 4 (b) 4, 2, 1, 3, 5
 (c) 4, 3, 1, 2, 5 (d) 4, 5, 2, 3, 1

DIRECTION (Qs. 50) : In question below, which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?

50. LU_TUPLUBTU_LUBT_P_UBTUP
 (a) LBPU (b) BPUL
 (c) PBUL (d) BUPL
51. Govind is 48 years old. He is twice as old as his son Prem is now. How old was Prem seven years before ?
 (a) 16 (b) 17 (c) 13 (d) 18
52. Pointing to a man, a lady said "His mother is the only daughter of my mother". How is the lady related to the man?
 (a) Mother (b) Daughter
 (c) Sister (d) Aunt

53. After walking 10 m, Shankar turned left and covered a distance of 6 m, then turned right and covered a distance of 20 m. In the end, he was moving towards the south. From which direction did Shankar start his journey?

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

54. If '-' stands for '+', '+' stands for '×', '×' stands for '-' then which one of the following is not correct ?

(a) $22 + 7 - 3 \times 9 = 148$
 (b) $33 \times 5 - 10 + 20 = 228$
 (c) $7 + 28 - 3 \times 52 = 127$
 (d) $44 - 9 + 6 \times 11 = 87$

55.

11
3
28
5

 4

22
5
57
20

 3

121
6
?
25

 5
- (a) 176 (b) 115
 (c) 157 (d) 131

- 56.

				63							
				7		9		1			
3		1		7		?					

(a) 3 (b) 9
 (c) 5 (d) 2

57. Five policemen are standing in a row facing south. Shekhar is to the immediate right of Dhanush. Bala is between Basha and Dhanush. David is at the extreme right end of the row. Who is standing in the middle of the row?

(a) Bala (b) Basha
 (c) Shekhar (d) Dhanush

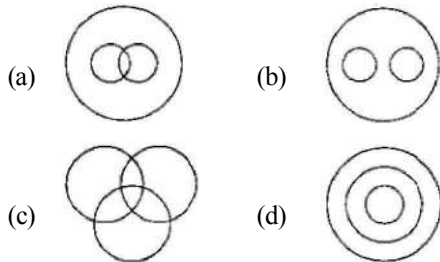
DIRECTIONS (Qs. 58) : In the following question, one statement is given followed by two conclusions I and II. You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You have to decide which of the given conclusions, if any follow from the given statements.

58. **Statement :** Songs always have singers to sing them.

Conclusions:

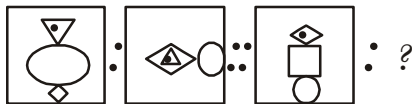
- I. Singers make a song.
 II. There is no un-sung song.
 (a) Only conclusion II follows
 (b) Both conclusions I and II follow
 (c) Neither conclusion I nor II follows
 (d) Only conclusion I follows

59. Which of the following states the relationship between Sociology, Psychology and Humanities ?

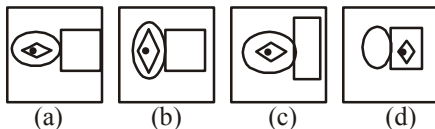


60. Select the related figure from the given alternatives.

Question figures



Answer figures



61. From the given alternatives select the word which can be formed using the letters given in the word.

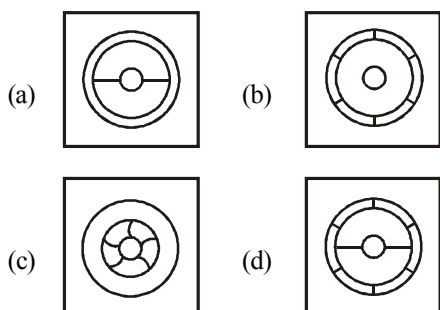
ULTRANATIONALISM

- (a) ULTRAMONTANE
(b) ULTRAMODERN
(c) ULTRAIST
(d) ULULATE

62. In the following question, select the answer figure in which the question figure is hidden / embedded.

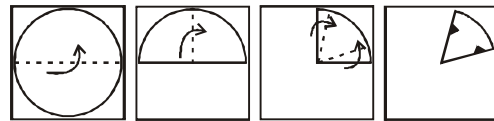


Answer Figures:

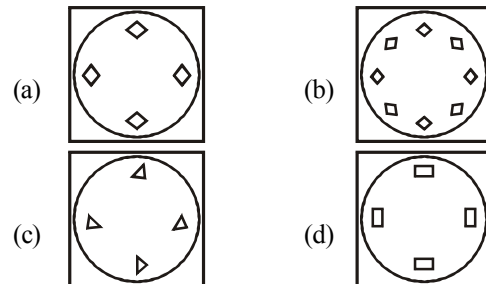


DIRECTIONS (63-64) : In each of the following questions, a piece of paper is folded and cut as shown below in the question figures. From the given answer figures, indicate how It will appear when opened?

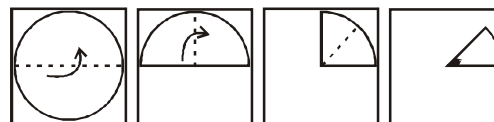
63. **Question Figures:**



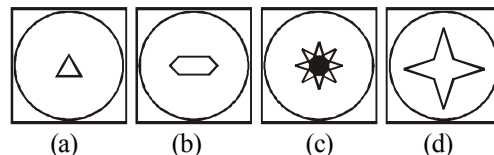
Answer Figures:



64. **Question Figures:**



Answer Figures:



65. A word is represented by only one set of numbers as given in anyone of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in two matrices given below. The columns and rows of matrix I are numbered from 0 to 4 and that of matrix II numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column e.g. 'B' can be represented by 01, 10, 22, etc. and 'F' can be represented by 55, 76, 86, etc. Similarly, you have to identify the set for the given word - CAGE.

Matrix-I

	0	1	2	3	4
0	A	B	C	D	E
1	B	C	D	E	A
2	C	D	B	A	E
3	D	C	B	E	A
4	E	B	A	C	D

Matrix-II

	5	6	7	8	9
5	F	G	H	I	J
6	G	F	I	J	H
7	I	F	G	J	H
8	H	F	G	I	J
9	J	F	G	J	I

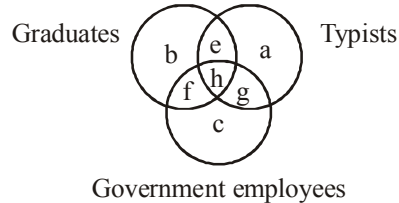
- (a) 95, 82, 31, 14 (b) 20, 00, 65, 40
(c) 14, 20, 41, 86 (d) 00, 21, 41, 95
66. In a certain code, a number 13479 is written as AQFJL and 2568 is written as DMPN. How is 396824 written in that code?
(a) QLPNMJ (b) QLPNMF
(c) QLPMNF (d) QLPNDF
67. In a certain code OVER is written as \$#%*. and VIST is written as #+×-. How is SORE written in that code?
(a) ×\$*% (b) %×\$*
(c) ×*\$% (d) ×%*\$
68. A boy goes to see a film and finds a man who is his relative. The man is the husband of the sister of his mother. How is the man related to the boy?
(a) Brother (b) Nephew
(c) Uncle (d) Father
69. Laxman went 15 km to the west from my house, then turned left and walked 20 km. He then turned East and walked 25 km and finally turning left covered 20 km. How far was he from my house?
(a) 5 km (b) 10 km
(c) 40 km (d) 80 km
70. Rearrange the first four letters, in any way, of the word
DECISION. Find how many words can be formed by using all the four words.
(a) One (b) Two
(c) Three (d) More than three
71. In the following question a word is given followed by four different words, one of which can be formed by using the letter of the given word find the word.
'IMMEDIATELY'
(a) DIALECT (b) LIMITED
(c) DIAMETER (d) DICTATE
72. Five boys took part in a race. Raj finished before Mohit but behind Gaurav. Ashish finished before Sanchit but behind Mohit. Who won the race?
(a) Raj (b) Gaurav
(c) Mohit (d) Ashish

DIRECTIONS (Qs. 73-75) : Study the following information carefully to answer the given questions.

Eight friends A, B, C, D, E, F, G and H are sitting around a circle facing the centre but not necessarily in the same order. G sits third to left of D. Only one person sits between D and F. B sits second to right of H. H is not an immediate neighbour of D. C is not an immediate neighbour of D. E is an immediate neighbour of H.

73. What is the position of E with respect to the position of C?
(a) Third to the left (b) Second to the left
(c) Immediate right (d) Third to the right
74. Who amongst the following sits exactly between A and G?
(a) B (b) C
(c) E (d) F
75. Four of the following five are alike in a certain way and thus form a group. Which is the one that does not belong to that group?
(a) CG (b) AE
(c) HD (d) EC

DIRECTIONS (Q. 76-77): Below is given a figure made of three circles intersecting one another. These circles represent graduates, typists and Government employees. The intersecting regions have been denoted by a, b, c, e, f, g and h, respectively. Study the diagram carefully and answer the questions that follow.



76. Which of the following letters represents the typists who are only graduates ?
(a) e (b) h (c) g (d) a
77. Which of the following letters represents the typists who are government employees but not graduates?
(a) e (b) g (c) f (d) h

DIRECTIONS (Qs. 78-80): Answer these questions referring to the symbol-letter-number sequence given below:

E G 4 B H 7 5 @ K 8 D N £ Q Z \$ W 3 C 1 9 * 1 B 2 S 6

78. How many such consonants are there in the above sequence which are immediately preceded by a symbol and immediately followed by a digit ?
(a) One (b) Two
(c) None (d) Three

79. What should come in place of the question mark (?) in the following sequence ?
4H@, KDQ, ?, 9IS
(a) ZW1 (b) NQ\$
(c) @8N (d) \$W9
80. Which of the following is exactly in the midway between the ninth from left end and the seventh from right end ?
(a) Q (b) Z (c) \$ (d) W

GENERAL AWARENESS

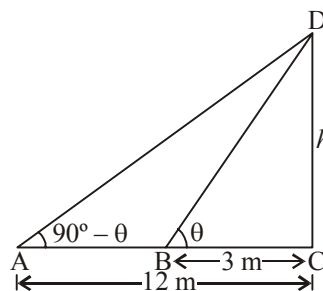
81. Which one of the following is not a computer language?
(a) Cobol (b) Visual Basic
(c) HTML (d) Netscape
82. Who among the following was the first Governor General of India?
(a) Lord Amherst
(b) Lord William Bentinck
(c) Sir Charles Metcalfe
(d) Robert Clive
83. Which one of the following is not a constituent of biogas?
(a) Methane (b) Carbon dioxide
(c) Hydrogen (d) Nitrogen dioxide
84. In which one of the following sessions was the Indian National Congress split into moderates and extremists?
(a) Nagpur (b) Allahabad
(c) Surat (d) Calcutta
85. Bar is a unit of which one of the following?
(a) Force (b) Energy
(c) Pressure (d) Frequency
86. Which of the following metals are present in haemoglobin and chlorophyll, respectively?
(a) Fe and Mg (b) Fe and Zn
(c) Mg and Zn (d) Zn and Mg
87. A mother of blood group O has a group O child. What could be the blood group of father of the child?
(a) Only O (b) A or B or O
(c) A or B (d) Only AB
88. Who among the following was the founder of the Muslim League?
(a) Muhammad Ali Jinnah
(b) Shaukat Ali
(c) Nawab Salimullah
(d) Aga Khan
89. Which one among the following is **not** a source of tax revenue for the Central Government in India ?
(a) Income tax (b) Customs duties
(c) Service tax (d) Motor Vehicle tax
90. Which of the following does **not** form part of current account of Balance of Payments?
(a) Export and import of goods
(b) Export and import of services
(c) Income receipts and payments
(d) Capital receipts and payments
91. Which one of the following Schedules of the Constitution of India includes the disqualification of a Legislator on grounds of defection?
(a) 8th Schedule (b) 7th Schedule
(c) 9th Schedule (d) 10th Schedule
92. Which one of the following causes the chikungunia disease?
(a) Bacteria (b) Helminthic worm
(c) Protozoan (d) Virus
93. Who among the following recommends to the Parliament for the abolition of the Legislative Council in a State?
(a) The President of India
(b) The Governor of the concerned State
(c) The Legislative Council of the concerned State
(d) The Legislative Assembly of the concerned State
94. Which one of the following vitamins helps in clotting of blood?
(a) Vitamin-A (b) Vitamin-B₆
(c) Vitamin-D (d) Vitamin-K
95. The 'Thomas Cup' is associated with
(a) Table Tennis (b) Lawn Tennis
(c) Badminton (d) Billiards
96. Which one among the following pairs is correctly matched?
(a) The Second Battle : Defeat of Jaichand of Kannauj by Muhammad of Ghori
(b) The First Battle of : Defeat of Sikander Panipat Lodhi by Babur
(c) The Battle of : Defeat of Humayun by Sher Shah Chausa
(d) The Battle of : Defeat of Rana Khanwa Pratap by Akbar
97. What is the purpose of adding baking soda to dough?
(a) To generate moisture
(b) To give a good flavour
(c) To give good colour
(d) To generate carbon dioxide
98. The 'Arthashastra' is a treatise on which one of the following?
(a) Economics
(b) Environment
(c) Political Philosophy
(d) Religion in Administration

99. Which one of the following glands in the human body stores iodine?
 (a) Parathyroid (b) Thyroid
 (c) Pituitary (d) Adrenal
100. India's first integrated Defense Communication Network (DCN) has been launched in which of the following cities?
 (a) New Delhi (b) Lucknow
 (c) Ahmedabad (d) Kochi
101. The book "The mind of the terrorist: the Psychology of terrorism from the IRA to al-Qaeda" has been authored by whom?
 (a) Amitav Ghosh (b) Ashwin Sanghi
 (c) Kunal Basu (d) Jerrold M. Post
102. The Government of India (GoI) has extended the ban on the import of milk and milk products of China till which year?
 (a) June 2017 (b) March 2017
 (c) December 2017 (d) January 2017
103. What is the recently extended deadline for states to join Union Government's Ujwal Discom Assurance Yojana (UDAY) scheme?
 (a) March 2017 (b) January 2018
 (c) March 2018 (d) January 2017
104. As of now, how many countries are members of Nuclear Suppliers Group (NSG)?
 (a) 48 (b) 56
 (c) 64 (d) 96
105. India's first AYUSH university will be set up in which state of India?
 (a) Sikkim (b) Haryana
 (c) Karnataka (d) West Bengal
106. Junk e-mail is also called
 (a) Crap (b) Spoof
 (c) Sniffer script (d) Spam
107. A program designed to destroy data on your computer which can travel to 'infect' other computers is called a
 (a) Disease (b) Torpedo
 (c) Hurricane (d) Virus
108. File extension is used
 (a) For naming the file
 (b) To ascertain that file name is not lost
 (c) To identify file
 (d) To identify file type
109. ALU of CPU has
 (a) RAM space
 (b) Register
 (c) Byte space
 (d) Secondary storage space
110. What happens when operating system is located in RAM?
 (a) Copying (b) Device driving
 (c) Booting (d) Multitasking
111. Gorakhpur which has the longest railway platform in the world is located in which of the following states?
 (a) Odisha (b) West Bengal
 (c) Uttar Pradesh (d) Chhattisgarh
112. Which of the following stations has all the three gauges viz. broad, metre and narrow?
 (a) Lucknow (b) Chandigarh
 (c) Shimla (d) Siliguri
113. What is the width of broad gauge railway line in India?
 (a) 5 feet 3 inches (b) 5 feet 6 inches
 (c) 4 feet 11 inches (d) 5 feet 4 inches
114. Match the manufacturing units with their locations
- | Manufacturing Unit | State |
|----------------------------------|----------------|
| A. Chittaranjan Locomotive Works | 1. Tamilnadu |
| B. Integral Coach Factory | 2. Punjab |
| C. Wheel and Axle Plant | 3. West Bengal |
| D. Rail Coach Factory | 4. Karnataka |
- (a) A - 3; B - 4; C - 1; D - 2
 (b) A - 2; B - 1; C - 4; D - 3
 (c) A - 3; B - 1; C - 4; D - 2
 (d) A - 3; B - 1; C - 2; D - 4
115. Which of the following stations was formerly known as Victoria Terminus?
 (a) Churchgate Railway Station
 (b) Mumbai Central
 (c) Lokmanya Tilak Terminus
 (d) Chhatrapathi Shivaji Terminus
116. Which Country will host FIFA World Cup 2022?
 (a) Qatar (b) Brazil
 (c) France (d) Russia
117. Which country recently issued currency based on polymer rather than paper?
 (a) India
 (b) TheUnitedStatesofAmerica
 (c) England
 (d) France
118. Which male athlete has been crowned IAAF male athlete of the year 2016?
 (a) UsainBolt (b) BritonMoFarah
 (c) ThiagoBraz (d) EliudKipchoge
119. The winner of the International Children's Peace Prize 2016 belongs to which country?
 (a) India (b) Pakistan
 (c) Bangladesh (d) Nepa
120. Who has been named as the Forbes Asia's Businessman of the Year for 2016 ?
 (a) Wang Jianlin (b) Huanming Yang
 (c) Cheng Wei (d) Haojing Shao

Hints & Explanations

1. (a) $2 + \sqrt{2} + \frac{1}{2 + \sqrt{2}} - \frac{1}{2 - \sqrt{2}}$
 $= 2 + \sqrt{2} + \frac{2 - \sqrt{2} - 2 - \sqrt{2}}{4 - 2}$
 $= 2 + \sqrt{2} + \frac{(-2\sqrt{2})}{2} = 2 + \sqrt{2} - \sqrt{2} = 2$
2. (d) $\therefore 1.\overline{34} = \frac{134-1}{99} = \frac{133}{99}$
 and $4.\overline{12} = \frac{412-41}{90} = \frac{371}{90}$
 $\therefore 1.\overline{34} + 4.\overline{12} = \frac{133}{99} + \frac{371}{90} = \frac{1330 + 4081}{990}$
 $= \frac{5411}{990} = 5\frac{461}{990}$
3. (c) Share of B + C = $\frac{1872}{9-3} \times (5+8) = ₹ 4056$
4. (d) Equivalent % interest for compound rate of interest of 8% for 2 years
 $= 8 + 8 + \frac{8 \times 8}{100} = 16.64\%$
 So, interest = 16.64% of 3980 $\approx$ 662
5. (d) Total time required = $\frac{14}{5} \frac{14}{10}$
 $= \frac{28}{10} \frac{14}{10} = 4.2 \text{ hrs}$
6. (d) 30 litres mixture contains 15 litres of water. When milk added to this, quantity of water will same in sance (i.e. 15 l).
 Let x l of pure milk to be added, then 30% of (30+x) = 15
 solve, x = 20
7. (c) There are 5 + 7 = 12 balls in the bag and out of these two balls can be drawn in $^{12}C_2$ ways. There are 5 green balls, therefore, one green ball can be drawn in 5C_1 ways; similarly, one red ball can be drawn in 7C_1 ways so that the number of ways in which we can draw one green ball and the other red is $^5C_1 \times ^7C_1$. Hence, P (one green and the other red)
 $= \frac{{}^5C_1 \times {}^7C_1}{{}^{12}C_2} = \frac{5}{1} \times \frac{7}{1} \times \frac{1 \times 2}{12 \times 11} = \frac{35}{66}$

8. (c) Let the cost price = ₹ x
 Profit = ₹ x
 Cost price of 8 dozen pencil = ₹ 7x
 Gain per cent = $\frac{x}{7x} \times 100$
 $= \frac{100}{7} = 14\frac{2}{7}\%$
9. (b) Let the height of the tower be h m and $\angle CBD = \theta$ then $\angle DAC = 90^\circ - \theta$ (Because both angles are complementary)



$\therefore$ In $\triangle BCD$,

$$\tan \theta = \frac{CD}{BC} \Rightarrow \tan \theta = \frac{h}{3}$$

Now, in $\triangle ACD$

$$\tan (90^\circ - \theta) = \frac{CD}{AC} \Rightarrow \cot \theta = \frac{h}{12}$$

$$\frac{1}{\tan \theta} = \frac{h}{12}$$

$$h \tan \theta = 12$$

Put the value of $\tan \theta$

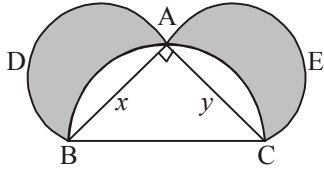
$$h \times \frac{h}{3} = 12$$

$$h^2 = 36 \therefore h = 6$$

Then, height of tower = 6 m.

10. (a) We know that, the triangle of same segment of a circle makes an equal angles.
 $\therefore \angle XBY = \angle XAY = 45^\circ$
 In $\triangle BXY$, $\angle BXY + \angle XBY + \angle BYX = 180^\circ$
 $\Rightarrow 50^\circ + 45^\circ + \angle BYX = 180^\circ$
 $\therefore \angle BXY = 50^\circ$
 $\Rightarrow \angle BYX = 180^\circ - 95^\circ = 85^\circ$

11. (a) In
- $\triangle ABC$
- ,



$$BC = \sqrt{x^2 + y^2}$$

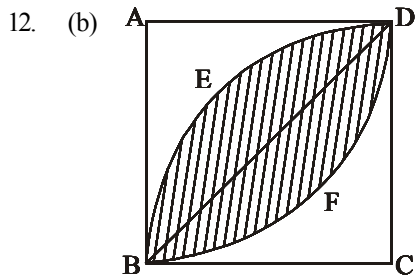
$$\therefore \text{Area of } \triangle ABC = \frac{1}{2} \times x \times y = \frac{1}{2} xy$$

$$\text{Area of semi-circle BACB} = \frac{\pi(x^2 + y^2)}{4}$$

$$\therefore \text{Area of shaded portion} = \text{Semi-circle ABDA} + \text{Area of semi-circle AECA} - (\text{Area of semi-circle BACB} - \text{Area of } \triangle ABC)$$

$$= \frac{\pi x^2}{4} + \frac{\pi y^2}{4} - \pi \left(\frac{x^2 + y^2}{4} \right) + \text{Area of } \triangle ABC$$

$$= \text{Area of } \triangle ABC$$



The above figure is symmetrical about BD

$$\text{Area of shaded part} = 2 \times \text{Area of BEDB}$$

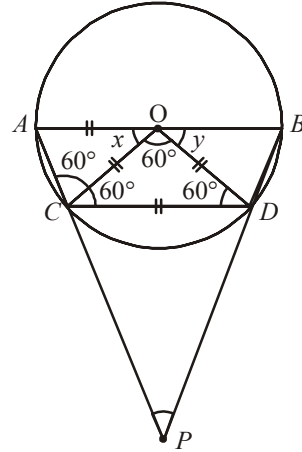
$$= 2 \times (\text{Area of BCDEB} - \text{Area of } \triangle BCD)$$

$$= 2 \left(\frac{\pi r^2}{4} - \frac{1}{2} \times BC \times CD \right)$$

$$= 2 \left(\frac{22}{7 \times 4} 7 \times 7 - \frac{1}{2} \times 7 \times 7 \right)$$

$$= 2 \times \frac{28}{2} = 28 \text{ cm}^2$$

13. (a)



$$\begin{aligned} AO &= CO \\ \Rightarrow OC &= OD = CD \\ (\because AO = OC = OD = \text{radii}) \end{aligned}$$

So, $\triangle COD$ is equilateral,

$$\angle x + \angle y = 180 - 60$$

$$\text{and } \angle x = \angle y$$

$$\therefore \angle 2x = 120^\circ$$

$$\angle x = 60^\circ$$

$$\angle DCP = 180^\circ - 120^\circ = 60^\circ$$

$$\text{and } \angle CDP = 60^\circ$$

$$\therefore \angle APB = 360^\circ - (60^\circ + 120^\circ + 120^\circ) = 60^\circ$$

14. (b) Given,
- $AC^2 = AB \times CB$

$$\Rightarrow x^2 = 2 \times (2 - x)$$

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

$$\begin{array}{c} A \quad \quad \quad C \quad \quad \quad B \\ \quad x \quad \quad \quad (2-x) \\ \leftarrow \quad \quad \quad 2 \quad \quad \quad \rightarrow \end{array}$$

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

$$\Rightarrow x = \frac{-2 \pm \sqrt{4 + 16}}{2 \times 1}$$

$$\Rightarrow x = -1 \pm \sqrt{5}$$

$$\text{Now, } BC = 2 - (-1 + \sqrt{5}) = 3 - \sqrt{5}$$

$$15. (b) \frac{37}{13} = 2 + \frac{1}{x + \frac{1}{y + \frac{1}{z}}}$$

$$\Rightarrow \frac{37}{13} \text{ can be expressed as}$$

$$= 2 + \frac{1}{2} = 2 + \frac{1}{\frac{1+1}{5+\frac{1}{2}}}$$

Now, this is compared by

$$2 + \frac{1}{x + \frac{1}{y + \frac{1}{z}}} = 2 + \frac{1}{1 + \frac{1}{5 + \frac{1}{2}}}$$

$$\therefore z = 2$$

$$\begin{aligned} 16. \quad (d) \quad & 27 \times 1.2 \times 5.5262 \times 0.6 \\ &= 27 \times 1 \frac{2}{9} \times 5 \frac{4736}{9000} \times \frac{6}{9} \\ &= 27 \times \frac{11}{9} \times \frac{49736}{9000} \times \frac{6}{9} \\ &= \frac{11 \times 49736 \times 2}{9000} = \frac{1094192}{9000} = 121.577 \end{aligned}$$

$$\begin{aligned} 17. \quad (d) \quad & 8^{9.4} \times 4^{12.8} \times 64^{8.1} = 16^? \\ & 8^{2 \times 4.7} \times 4^{12.8} \times 64^{8.1} = 16^? \\ & 64^{4.7} \times 4^{12.8} \times 64^{8.1} = 16^? \\ & 64^{4.7+8.1} \times 4^{12.8} = 16^? \\ & (64 \times 4)^{12.8} = 16^? \\ & (256)^{12.8} = 16^? \\ & 16^{2 \times 12.8} = 16^? \\ & 16^{25.6} = 16^? \\ & ? = 25.6 \end{aligned}$$

$$18. \quad (c) \quad \text{Given, } \tan x = \frac{3}{4}, 0^\circ < x < 90^\circ$$

$$\therefore \sin x = \frac{\tan x}{\sqrt{1 + \tan^2 x}}, 0^\circ < x < 90^\circ$$

$$= \frac{\frac{3}{4}}{\sqrt{1 + \frac{9}{16}}} = \frac{\frac{3}{4}}{\sqrt{\frac{25}{16}}} = \frac{3}{5} \text{ and}$$

$$\cos x = \frac{1}{\sqrt{1 + \tan^2 x}} = \frac{1}{\sqrt{1 + \left(\frac{3}{4}\right)^2}} = \frac{1}{\sqrt{\frac{16+9}{16}}} = \frac{4}{5}$$

$$\therefore \sin x \cos x = \frac{3}{5} \times \frac{4}{5} = \frac{12}{25}$$

$$19. \quad (c) \quad \text{Given, } \frac{\cos x}{1 + \operatorname{cosec} x} + \frac{\cos x}{\operatorname{cosec} x - 1} = 2$$

$$\Rightarrow \frac{2 \cos x \operatorname{cosec} x}{\operatorname{cosec}^2 x - 1} = 2$$

$$\Rightarrow \frac{\cos x \operatorname{cosec} x}{\cot^2 x} = 1$$

$$\Rightarrow \tan x = 1$$

$$\Rightarrow x = \frac{\pi}{4}$$

$$20. \quad (a) \quad \alpha \text{ and } \beta \text{ are the roots of the equation } ax^2 + bx + c = 0$$

$$\therefore \alpha + \beta = -\frac{b}{a} \text{ and } \alpha\beta = \frac{c}{a}$$

$$\begin{aligned} \therefore \left(\frac{1}{\alpha^2} - \frac{1}{\beta^2} \right)^2 &= \left(\frac{\beta^2 - \alpha^2}{\alpha^2 \beta^2} \right)^2 \\ &= \frac{(\alpha + \beta)^2 \{(\alpha + \beta)^2 - 4\alpha\beta\}}{(\alpha^2 \beta^2)^2} \end{aligned}$$

$$= \frac{\frac{b^2}{a^2} \left(\frac{b^2}{a^2} - \frac{4c}{a} \right)}{\left(\frac{c^2}{a^2} \right)^2}$$

$$= \frac{b^2}{c^4} (b^2 - 4ac)$$

$$21. \quad (d) \quad \text{Total executives recruited were 2953.}$$

$$22. \quad (d) \quad \text{Required ratio equals } 1044 : 998 = 522 : 499$$

$$\begin{aligned} 23. \quad (a) \quad & \text{Required average number of executives} = \\ & \text{sum of no. of all executives} \\ &= \frac{2965}{6} \approx 494 \end{aligned}$$

$$\begin{aligned} 24. \quad (a) \quad & \therefore \text{Volume of pipe, } V = \pi(r_1^2 - r_2^2) \times h \\ &= \frac{22}{7} [(3.5)^2 - (2.5)^2] \times 140 \\ &= \frac{22}{7} (12.25 - 6.25) \times 140 \\ &= 22 \times 6 \times 20 = 2640 \text{ cu cm} \end{aligned}$$

25. (c) Volume of solid cube = $(4)^3 = 64 \text{ cm}^3$
 Volume of recast cube = $(1)^3 = 1 \text{ cm}^3$
 $\therefore$ Total surface area of cube : Total surface area of recast cube
 $= x : y$
 $\Rightarrow x : y = 6(4)^2 : 6(1)^2 \times 64 = 1 : 4$
26. (d) Since 7381 is completely divisible by 11.
 $\therefore$ The value of 1^* is 7.
27. (b)
28. (b) H.C.F of co-prime numbers is 1.
29. (d) $x + x + 2 + x + 4 + x + 6 = 4 \times 36$
 $\Rightarrow 4x + 12 = 144 \Rightarrow 4x = 144 - 12$
 $\Rightarrow 4x = 132 \Rightarrow x = \frac{132}{4} = 33$
30. (a) Gain = S.P. of 33 metres – C.P. of 33 metres
 $=$ S.P. of 11 metres
 $\Rightarrow$ S.P. of 22 metres = C.P. of 33 metres
 $\therefore$ % gain = $\frac{\text{gain}}{\text{C.P. of metres}} \times 100$
 $= \frac{\text{S.P. of 11 metres}}{\text{C.P. of 33 metres}} \times 100$
 $= \frac{\text{S.P. of 11 metres}}{\text{S.P. of 22 metres}} \times 100 = \frac{11}{22} \times 100$
 $= 50\%$
31. (b) Ratio of profit = $1 \times 12 : 2 \times 6 : 3 \times 4 = 1 : 1 : 1$
 $\therefore$ Manav's share = $45000 \times \frac{1}{3} = ₹ 15000$
32. (a) $M_1 = 40, D_1 = 8$ (As days and hrs both denote time)
 $W_1 = 60$ (cutting of trees is taken as work)
 $M_2 = 40 - 8 = 32, D_2 = 12, W_2 = ?$
 Putting the values in the formula
 $M_1 D_1 W_2 = M_2 D_2 W_1$
 We have, $40 \times 8 \times W_2 = 32 \times 12 \times 60$
 or, $W_2 = \frac{32 \times 12 \times 60}{40 \times 8} = 72$ trees.
33. (a) In 2 minutes, he ascends = 1 metre
 $\therefore$ 10 metres, he ascends in 20 minutes.
 $\therefore$ He reaches the top in 21st minute.
34. (a) Radius of a circular grass lawn (without path) = 35 m
 $\therefore$ Area = $\pi r^2 = \pi(35)^2$
 Radius of a circular grass lawn (with path)
 $= 35 + 7 = 42 \text{ m}$
 $\therefore$ Area = $\pi r^2 = \pi(42)^2$
 $\therefore$ Area of path = $\pi(42)^2 - \pi(35)^2$
 $= \pi(42^2 - 35^2)$
 $= \pi(42 + 35)(42 - 35)$
 $= \pi \times 77 \times 7$
 $= \frac{22}{7} \times 77 \times 7 = 1694 \text{ m}^2$
35. (c) Let C.P. of 1 article = ₹ 1
 then C.P. of 25 articles = ₹ 25
 and S.P. of 25 articles = ₹ 20
 $\therefore$ loss % = $\frac{25 - 20}{20} \times 100 = 25\%$
36. (a) 1 horse = 2 cows, 10 horses = 20 cows.
 $\Rightarrow$ 10 horses + 15 cows = 20 + 15 = 35 cows.
 15 horses + 10 cows = 40 cows. Now 35 cows eat 5 acres.
 $\Rightarrow$ 40 cows eat $5 \times \frac{40}{35} = 5 \frac{5}{7}$ acres.
 Here we have converted everything in terms of cows, you can work in terms of horses also.
37. (c) Let the speed of the bus be $x \text{ km/h}$.
 then speed of the car = $(x + 25) \text{ km/h}$
 $\therefore \frac{500}{x} - \frac{500}{x + 25} = 10$
 $\Rightarrow x^2 + 25x - 1250 = 0 \Rightarrow x = 25$
 Thus speed of the bus = 25 km/h
 Speed of the car = 50 km/h
Alternative:
 Difference in speeds 25 km/hr is in only option (c).
38. (c) $\frac{x}{y} = \frac{3}{4} \Rightarrow \frac{7x}{3y} = \frac{7}{3} \times \frac{3}{4} = \frac{7}{4}$
 By componendo and dividendo,
 $\frac{7x - 3y}{7x + 3y} = \frac{7 - 4}{7 + 4} = \frac{11}{3}$
39. (a) $x + \frac{1}{x} = \sqrt{3}$
 Cubing both sides,
 $x^3 + \frac{1}{x^3} + 3\left(x + \frac{1}{x}\right) = (\sqrt{3})^3 \Rightarrow x^3 + \frac{1}{x^3} + 3\sqrt{3} = 3\sqrt{3}$

$$\Rightarrow x^3 + \frac{1}{x^3} = 0$$

Now,

$$x^{18} + x^{12} + y^6 + 1 = x^{12}(x^6 + 1) + 1(x^6 + 1)$$

$$= (x^{12} + 1)(x^6 + 1)$$

$$= (x^{12} + 1) \cdot x^3 \left(x^3 + \frac{1}{x^3} \right) = 0$$

40. (b) $\frac{\tan \theta + \cot \theta}{\tan \theta - \cot \theta} \cdot \frac{2}{1}$

By componendo and dividendo,

$$\frac{2 \tan \theta}{2 \cot \theta} \cdot \frac{3}{1}$$

$$\Rightarrow \frac{\sin \theta}{\cos \theta} \cdot \frac{\sin \theta}{\cos \theta} \cdot 3$$

$$\Rightarrow \sin^2 \theta = 3 \cos^2 \theta$$

$$\Rightarrow \sin^2 \theta = 3(1 - \sin^2 \theta)$$

$$\Rightarrow 4 \sin^2 \theta = 3$$

$$\Rightarrow \sin^2 \theta = \frac{3}{4}$$

$$\Rightarrow \sin \theta = \frac{\sqrt{3}}{2}$$

41. (c) $\begin{array}{ccc} A & C & E \\ +5 \downarrow & +5 \downarrow & +5 \downarrow \\ F & H & J \end{array}$

Similarly, $\begin{array}{ccc} O & Q & S \\ +5 \downarrow & +5 \downarrow & +5 \downarrow \\ \boxed{T} & \boxed{V} & \boxed{X} \end{array}$

42. (a) As, a saint practices meditation. Similarly, a scientist does research.

43. (c) $18/3 - 1 = 5$

$$12/3 - 1 = \boxed{3}$$

44. (c)

45. (d) $H \xrightarrow{(-1)} G \xrightarrow{(-1)} F \xrightarrow{(-1)} E$

$$P \xrightarrow{(-1)} O \xrightarrow{(-1)} N \xrightarrow{(-1)} M$$

$$D \xrightarrow{(-1)} C \xrightarrow{(-1)} B \xrightarrow{(-1)} A$$

$$M \xrightarrow{(+6)} S \xrightarrow{(+1)} T \xrightarrow{(+1)} U$$

M S T U is odd word

46. (a) $F \xrightarrow{+1} G \xrightarrow{+1} H \xrightarrow{+1} I \xrightarrow{+1} J$

$$A \xrightarrow{+0} A \xrightarrow{+0} A \xrightarrow{+0} A \xrightarrow{+0} A$$

$$G \xrightarrow{-1} F \xrightarrow{+3} I \xrightarrow{-1} H \xrightarrow{+3} K$$

47. (c) $3 + 3 = 6$

$$6 + 3 = 9$$

$$9 + 6 = 15$$

$$15 + 9 = 24$$

$$24 + 15 = 39$$

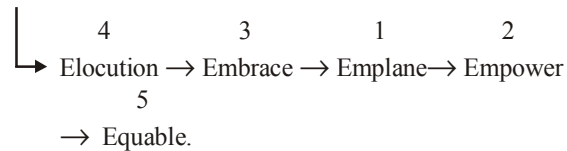
$$39 + 24 = 63$$

$$63 + 39 = 102$$

48. (d) As, $A + G + E = 1 + 7 + 5 = 13$

Similarly, $C + A + R = 3 + 1 + 18 = 22$

49. (c) As per dictionary



50. (b) Words LUB and TUP are in consecutive order.

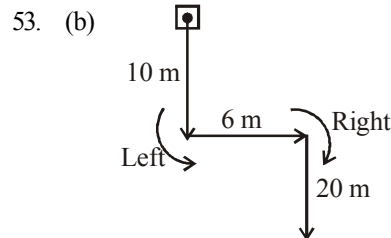
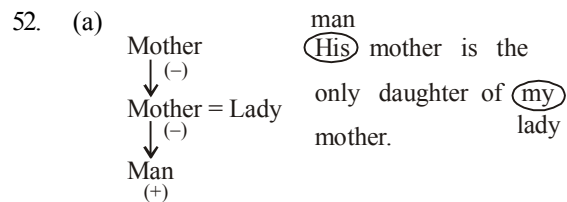
LUB/TUP/LUB/TUP/LUB/TUP/
LUB/TUP

51. (b) Govind's age = 48 years

According to question

$$\text{Prem's age} = 48/2 = 24 \text{ years}$$

$$\text{Prem's age seven years before} = 24 - 7 = 17 \text{ years.}$$



From the diagram, it is clear that Shankar started his journey from North to South.

54. (c) By options—

(a) $22 \times 7 + 3 - 9 = 148$

$154 + 3 - 9$

$157 - 9 = 148$ (Correct)

(b) $33 - 5 + 10 \times 20 = 228$

$33 - 5 + 200$

$200 + 33 - 5$

$233 - 5 = 228$ (Correct)

(c) $7 \times 28 + 3 - 52 = 127$

$196 + 3 - 52$

$199 - 52 = 147$ (Incorrect)

(d) $44 + 9 \times 6 - 11 = 87$

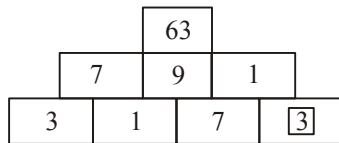
$44 + 54 - 11$

$98 - 11 = 87$ (Correct)

55. (a)

$$\begin{array}{ccc} 11 & 22 & 121 \\ 3 \left[\begin{array}{l} 11 + 5 + 4 \times 3 \\ = 16 + 12 = 28 \end{array} \right] 4 & 5 \left[\begin{array}{l} 22 + 20 + 5 \times 3 \\ = 42 + 15 = 57 \end{array} \right] 3 & 6 \left[\begin{array}{l} 121 + 25 + 6 \times 5 \\ = 146 + 30 = 176 \end{array} \right] 5 \\ 5 & 20 & 25 \end{array}$$

56. (a)

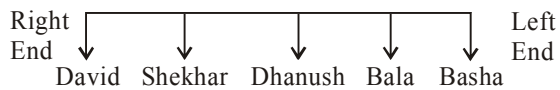


$\Rightarrow 63$

$\Rightarrow 7 \times 1 \times 9 = 63$

$\Rightarrow 3 \times 1 \times 7 \times \boxed{3} = 63$

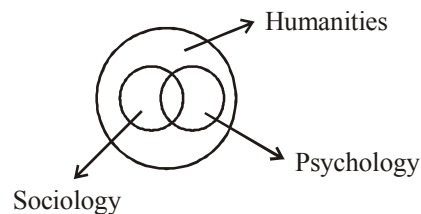
57. (d) Standing arrangement : (facing south)



Hence, Dhanush is standing at the middle of the row.

58. (d) Any written piece is recognised as song when it is sung by a singer. Therefore, only Conclusion I follows.

59. (a)



60. (a) The middle element adjacent to the right side line after rotating 90° anticlockwise. The bottom element goes up on the top and becomes enlarge. The top element becomes the inner figure of bottom element.

61. (c) By options—

(a) can not be formed as there is no 'E' in the given word.

(b) can not be formed as there is no 'D' in the given word.

(d) can not be formed as there is no 'E' and only 'U' in the given word.

So, option (c) can be formed.

62. (d) 63. (b) 64. (c)

65. (b) $C \Rightarrow 02, 11, 20, 31, 43$

$A \Rightarrow 00, 14, 23, 34, 42$

$G \Rightarrow 56, 65, 77, 87, 97$

$E \Rightarrow 04, 13, 24, 33, 40$

Option	C	A	G	E
(a)	95	82	31	14
(b)	20	00	65	40
(c)	14	20	41	86
(d)	00	24	41	95

66. (d) Given

1	3	4	7	9	2	5	6	8
A	Q	F	J	L	D	M	P	N

From the above table, 396824 is coded as:

3	9	6	8	2	4
Q	L	P	N	D	F

Thus,

67. (a) Given,

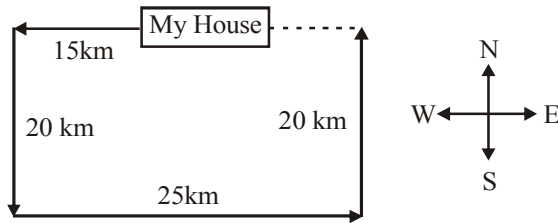
O	V	E	R	V	I	S	T
\$	#	%	*	#	+	×	-

From the above table, SORE is coded as :

S	O	R	E
×	\$	*	%

68. (c) The sister of one's mother is one's maternal aunt. Hence, the man is the husband of the boy's maternal aunt.

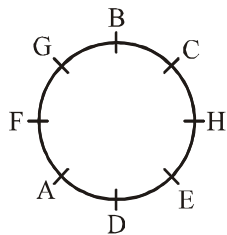
69. (b) The direction movement of laxman is as following:



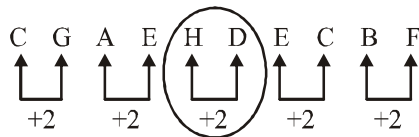
From the above diagram, required distance is
 $= 25 - 15 = 10 \text{ km}$.

70. (a) The first four letters are D, E, C, I and only word DICE can be formed. so, the answer is option (a).
71. (d) 'LIMITED' is the only word which can be formed using the letters of given word.
72. (b) The order in which the five boys reach the finishing line is, Gaurav > Raj > Mohit > Ashish > Sanchit.
 Hence, Gaurav won the race.

(73-75):



73. (b) Clearly, E is second to the left of C.
74. (d) F sits exactly between A and G.
75. (c) Except HD, in all other pairs, first member is present on the clockwise side of other.



76. (a) Letter e represents the typists who are only graduates but not Government employees.
77. (b) Letter g represent the typists who are only Government employees but not graduates
78. (b) E G 4 B H 7 5 @ K 8 D N £ Q Z \$ W 3 C 1 9
 * 1 B 2 S 6

79. (a) The first, second and third element of each group is sixth element to the right of the respective element of previous group as given in all in the sequence.
80. (b) There are 27 elements in all in the sequence. So, $(27 - 9 - 7 =)$ 11 elements are between the 9th from left and 7th from right. Hence, $(9 + 6 =)$ 15th element from the left and will be the required answer.
81. (d) Netscape is an Internet browser that was popular during the early 1990's.
82. (a)
83. (d) Nitrogen dioxide (NO_2) is not a component of biogas.
84. (c) The 23rd Session (1907) of the Congress was held at Surat. In the session, there was an open clash between the Moderates and the Extremists and ultimately it led to a split in the Congress.
85. (c) $1 \text{ Bar} = 10^5 \text{ Pa}$. Both bar and Pa are the unit of pressure.
86. (a) Fe and Mg metals are present in haemoglobin and chlorophyll respectively.
87. (b) The blood group of father of the child could be A or B or O.
88. (c) The All India Muslim League, a political organization was founded in 1906 by Aga Khan under the Nawab of Dhaka Salimullah. Its main purpose was to safeguard the political rights of Muslims in India.
89. (d) Motor Vehicle tax is not a source of tax revenue for the central government in India.
90. (d) Capital receipts and payments do not form part of current account of Balance of Payment.
91. (d) The 10th Schedule to the Indian Constitution is known as Anti-Defection Law. It was inserted by the 52nd Amendment Act 1985 to the Constitution. It sets the provisions for disqualification of elected members on the grounds of defection to another political party.
92. (d) Chikungunia is caused by chikenguniya virus which is an insect borne virus of genus *Alphavirus*. Symptoms show high fever, maculopapular rash, headache, etc.
93. (d)
94. (d) Vitamin-K adds in blood clotting. Vitamin-K acts as an essential cofactor for factor-II, VII, IX, X and also for proteins Z, C and S.

95. (c) Thomas Cup is associated with Badminton.
96. (b) First Battle of Panipat (1526) was fought between two mega-powers- Babur, then ruler of Kabul and Ibrahim Lodhi, king of Delhi Sultanate. It was fought near Panipat (present day Haryana). Babur won the battle and established the Mughal Empire. Second Battle of Panipat (1556) was fought between Akbar (Ruler of Mughal Dynasty) and Muhammad Adil Shah (ruler of Pashtan Suri Dynasty), along with his Prime Minister Hemu. Third Battle of Panipat (1761) was fought between the Afghans and the Marathas. The battle lasted for two months which ultimately resulted in the defeat of Marathas and end of their dominance in India.
97. (d) Baking soda has sodium bicarbonate as the chief constituent. It decomposes on heating giving carbon dioxide. This causes dough, cakes, biscuits etc. to expand and become light.
98. (c) The Arthashastra is a treatise on Political philosophy. The book, written in Sanskrit, discusses theories and principles of governing a state. The meaning of Arthashastra is 'Science of Polity'. It is written by Kautilya.
99. (b) Thyroid gland in human body contains iodine. Deficiency of iodine creates goitre disease. Which is observed by the enlargement of larynx.
100. (a) 101. (d) 102. (b) 103. (a)
104. (a) 105. (b) 106. (d) 107. (d)
108. (d) 109. (b) 110. (c) 111. (c)
112. (d) 113. (b) 114. (c) 115. (d)
116. (a) The 2022 FIFA World Cup will be hosted by Qatar. During a meeting between Qatari Prime Minister Sheikh Abdullah Bin Nasser Bin Khalifa Al Thani and Home Minister Rajnath Singh, India on December 3, 2016, India agreed to train Qatar's police for the FIFA World Cup 2022.
117. (c) 118. (a) 119. (a)
120. (c) Cheng Wei, Co-founder and Chief Executive of China's largest ride-sharing service provider Didi Chuxing (Didi) is Forbes Asia's Businessman of the Year for 2016. According to Forbes Asia, Didi has attracted 300 million users in 400 Chinese cities in just four years.