

ARITHMETIC

1. The product of two successive numbers is 9506. Which is the smaller of the two numbers?

(a) 96 (b) 97
(c) 98 (d) 99

2. What is the square root of $9 + 2\sqrt{14}$?

(a) $1 + 2\sqrt{2}$ (b) $\sqrt{3} + \sqrt{6}$
(c) $\sqrt{2} + \sqrt{7}$ (d) $\sqrt{2} + \sqrt{5}$

3. There are two taps A and B to fill up a water tank. The tank can be filled in 40 min, if both taps are on. The same tank can be filled in 60 min, if tap A alone is on. How much time will tap B alone take, to fill up the same tank?

(a) 64 min (b) 80 min
(c) 96 min (d) 120 min

4. In how many different ways can the letters of the word DESIGN be arranged so that the vowels are at the two ends?

(a) 48 (b) 72
(c) 36 (d) 24

5. Distance between point P and Q is 480 km. A train starts from point P at 6:00 AM with 60 km/hr towards Q. Another train starts from point Q towards P at 7:00 AM with 80 km/hr. At what time the trains will meet?

(a) 9:40 AM (b) 10:30 AM
(c) 10:00 AM (d) 11:00 AM

6. Naresh purchased a TV set for ₹11,250 after getting discount of 10% on the labelled price. He spent ₹150 on transport and ₹800 on installation. At what price should it be sold so that the profit earned would be 15% if no discount was offered?

(a) ₹12,937.50 (b) ₹14,030
(c) ₹13,450 (d) ₹15,467.50

7. If $P : Q = \frac{3}{5} : \frac{5}{7}$ and $Q : R = \frac{3}{4} : \frac{2}{5}$, then what is $P : Q : R$ equal to?

(a) $\frac{3}{5} : \frac{5}{7} : \frac{2}{5}$

(b) $\frac{9}{20} : \frac{15}{28} : \frac{2}{7}$

(c) $\frac{3}{5} : \frac{3}{4} : \frac{2}{5}$

(d) $\frac{3}{5} : \frac{5}{7} : \frac{3}{4}$

8. Arun invested a sum of money at a certain rate of simple interest for a period of four years. Had he invested the same sum at the same rate for a period of six years, the total interest earned by him would have been fifty per cent more than the earlier interest amount. What was the rate of interest per cent per annum?

(a) 4
(b) 8
(c) 5
(d) Cannot be determined

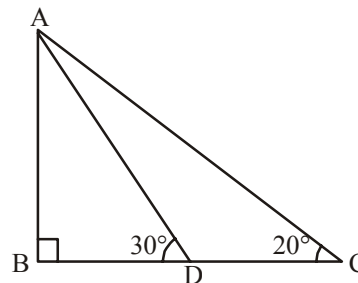
9. Two-thirds of three-fourths of one-fifth of a number is 15. What is 30 per cent of that number?

(a) 45 (b) 60 (c) 75 (d) 30

10. The sum of the circumference of a circle and the perimeter of a square is equal to 272 cm. The diameter of the circle is 56 cm. What is the sum of the areas of the circle and the square?

(a) 2464 sq cm
(b) 2644 sq cm
(c) 3040 sq cm
(d) Cannot be determined

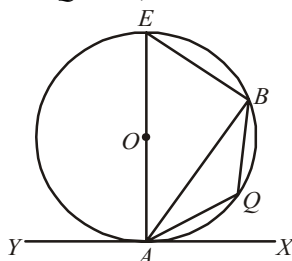
11.



In the given figure, $\angle ABD = 90^\circ$, $\angle BDA = 30^\circ$ and $\angle BCA = 20^\circ$. What is $\angle CAD$?

(a) 10° (b) 20° (c) 30° (d) 15°

12. In the figure given above, YAX is a tangent to the circle with centre O . If $\angle BAX = 70^\circ$ and $\angle BAQ = 40^\circ$, then what is $\angle ABQ$ equal to?



- (a) 20° (b) 30° (c) 35° (d) 40°
13. The diameter of two circles are 18 cm and 8 cm. The distance between their centres is 13 cm. What is the number of common tangents?
- (a) 1 (b) 2
(c) 3 (d) None of these
14. A parallelogram and a rectangle stand on the same base and on the same side of the base with the same height. If I_1, I_2 be the perimeters of the parallelogram and the rectangle respectively, then which one of the following is correct?
- (a) $I_1 < I_2$ (b) $I_1 = I_2$
(c) $I_1 > I_2$ but $I_1 \neq 2I_2$ (d) $I_1 = 2I_2$
15. If $3.7^x = 0.037^y = 10000$, then what is the value of $\frac{1}{x} - \frac{1}{y}$?
- (a) 1 (b) 2
(c) $1/2$ (d) $1/4$
16. If $3^x + 27(3^{-x}) = 12$, then what is the value of x ?
- (a) 4 (b) 3
(c) 1 or 2 (d) 0 or 1
17. The expression $\sin^2 x + \cos^2 x - 1 = 0$ is satisfied by how many values of x ?
- (a) Only one value of x (b) Two values of x
(c) Infinite values of x (d) No value of x
18. If $\cos A = \tan B$, $\cos B = \tan C$ and $\cos C = \tan A$ then $\sin^2 A$ is equal to

- (a) $\frac{\sqrt{5}-1}{4}$ (b) $\frac{\sqrt{5}-1}{2}$
(c) $\frac{3-\sqrt{5}}{2}$ (d) $\frac{\sqrt{3}-1}{2}$

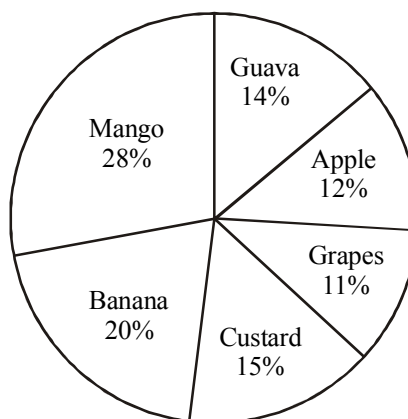
19. If $\sin x + \cos x = c$ then $\sin^6 x + \cos^6 x$ is equal to

- (a) $\frac{1-6c^2-3c^4}{16}$ (b) $\frac{1+6c^2-3c^4}{4}$
(c) $\frac{1-6c^2-3c^4}{16}$ (d) $\frac{1-6c^2-3c^4}{4}$

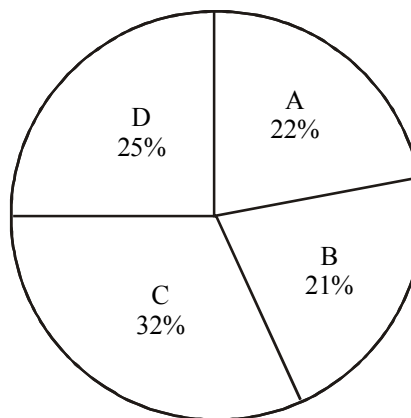
DIRECTIONS (Qs. 20-22): Study the following Pie-chart carefully and answer the questions given below:

A survey conducted on 5800 villagers staying in various villages and having various favourite fruits.

Favourite Fruits



People staying in various villages



20. Mango is the favourite fruit of 50% of the people from village C. People having their favourite fruit as mango from village C form approximately what per cent of the people having their favorite fruit as mango from all the villages together?
- (a) 48 (b) 53
(c) 61 (d) 57
21. 20% of the people from village D have banana as their favourite fruit and 12% of the people from the same village have guava as their favourite fruit. How many people from that village like other fruits?
- (a) 764 (b) 896
(c) 874 (d) 986

22. How many people in all have custard as their favourite fruit?
 (a) 850 (b) 864
 (c) 870 (d) 812
23. 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
24. 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
25. The angle of elevation of the top of a tower 30 m high from the foot of another tower in the same plane is 60° and the angle of elevation of the top of the second tower from the foot of the first tower is 30° . The distance between the two towers is m times the height of the shorter tower. What is m equal to?
 (a) $\sqrt{2}$ (b) $\sqrt{3}$
 (c) $\frac{1}{2}$ (d) $\frac{1}{3}$
26. When 60 is subtracted from 60% of a number, the result is 60. The number is :
 (a) 120 (b) 150
 (c) 180 (d) 200
27. $\sqrt{110.25} \times \sqrt{0.01} \div \sqrt{0.0025} - \sqrt{420.25}$ equals to:
 (a) 0.75 (b) 0.50
 (c) 0.64 (d) 0.73
28. The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they all change simultaneously at 8 : 20 hours, then at what time will they again change simultaneously ?
 (a) 8 : 20 : 08 hrs (b) 8 : 24 : 10 hrs
 (c) 8 : 27 : 12 hrs (d) 8 : 30 : 15 hrs
29. The average marks of 65 students in a class was calculated as 150. It was later realised that the marks of one of the students was calculated as 142, whereas his actual marks were 152. What is the actual average marks of the group of 65 students ? (Rounded off to two digits after decimal)
 (a) 151.25 (b) 150.15
 (c) 151.10 (d) 150.19
30. A man buys 50 pencils for ₹ 100 and sells 45 pencils for ₹ 90. Find his gain or loss %.
 (a) 20% (b) 35%
 (c) 25% (d) No gain or loss
31. Find a fractions which shall bear the same ratio to $\frac{1}{27}$ that $\frac{3}{11}$ does to $\frac{5}{9}$.
 (a) 1 : 27 (b) 1 : 45
 (c) 1 : 55 (d) 1 : 65
32. A is 30% more efficient than B. How much time will they, working together, take to complete a job which A alone could have done in 23 days?
 (a) 11 days (b) 13 days
 (c) $20\frac{3}{17}$ days (d) None of these
33. In a 800 m race around a stadium having the circumference of 200 m, the top runner meets the last runner on the 5th minute of the race. If the top runner runs at twice the speed of the last runner, what is the time taken by the top runner to finish the race ?
 (a) 20min (b) 15min
 (c) 10min (d) 5min
34. A rectangular parking space is marked out by painting three of its sides. If the length of the unpainted side is 9 feet, and the sum of the lengths of the painted sides is 37 feet, then what is the area of the parking space in square feet?
 (a) 46 (b) 81
 (c) 126 (d) 252
35. The list price of a watch is ₹ 160. A retailer bought the same watch ₹ 122.40. He got two successive discounts one at 10% and the other at a rate which was not legible. What is the second discount rate?
 (a) 12% (b) 14%
 (c) 15% (d) 18%
36. 4 pipes can fill a reservoir in 15, 20, 30 and 60 hours respectively. The first was opened at 6 am, second at 7 am third at 8 am and fourth at 9 am. When will the reservoir be full ?
 (a) 11 am (b) 12 pm
 (c) 12.30 pm (d) 1.00 pm
37. Points A and B are 70 km apart on a highway. One car starts from A and the another one from B at the same time. If they travel in the same direction, they meet in 7 hours. But if they travel towards each other, they meet in one hour. The speeds of the two cars are, respectively.
 (a) 45 and 25 km/h (b) 70 and 10 km/h
 (c) 40 and 30 km/h (d) 60 and 40 km/h

38. If $3x + 7 = x^2 + P = 7x + 5$, what is the value of P ?

- (a) $\frac{1}{2}$
 (b) $8\frac{1}{4}$
 (c) $8\frac{1}{2}$
 (d) Cannot be determined

39. If $x_2 - 3x + 1 = 0$, then the value of $x^3 + \frac{1}{x^3}$ is

- (a) 9 (b) 18
 (c) 27 (d) 1

40. If $x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta \neq 0$ and $x \sin \theta - y \cos \theta = 0$, then value of $(x^2 + y^2)$ is

- (a) $\sin \theta - \cos \theta$ (b) $\sin \theta + \cos \theta$
 (c) 0 (d) 1

GENERAL INTELLIGENCE & REASONING

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

41. King : Palace :: Eskimo : ?

- (a) Caravan (b) Asylum
 (c) Monastery (d) Igloo

42. AFKP : DINS :: WBGL : ?

- (a) ORUX (b) OSWA
 (c) OTYD (d) OQSU

43. 12 : 20 :: ?

- (a) 15 : 37 (b) 16 : 64
 (c) 27 : 48 (d) 30 : 42

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

44. (a) (47,49) (b) (5,7)
 (c) (29,31) (d) (11,13)
 45. (a) Marigold (b) Lotus
 (c) Tulip (d) Rose

DIRECTIONS (Qs. 46 to 47) : Complete the given series.

46. BDF, CFI, DHL, ?

- (a) CJM (b) EIM
 (c) EJO (d) EMI

47. 1, 3, 8, 19, 42, 89, ?

- (a) 108 (b) 184
 (c) 167 (d) 97

48. In a certain code DEPUTATION is written as ONTADEPUTI. How is DERIVATION written in that code ?

- (a) ONVADERITI (b) ONDEVARITI
 (c) ONVAEDIRTI (d) ONVADEIRIT

49. Arrange the following words as per order in the dictionary.

1. Forecast 2. Forget 3. Foreign 4. Forsook
 5. Force

- (a) 3, 5, 1, 2, 4 (b) 5, 1, 3, 2, 4
 (c) 5, 1, 3, 4, 2 (d) 5, 1, 2, 3, 4

DIRECTIONS (Qs. 50) : In question which one set of letters/ numbers when sequentially placed at the gaps in the given series shall complete it?

50. a _ cdd _ bcd _ abc _ dab _

- (a) b a d d c (b) a b d d c
 (c) b a d c d (d) b d a d c

51. Sohan ranks seventh from the top and twenty-sixth from the bottom in a class. How many students are there in the class ?

- (a) 33 (b) 34
 (c) 31 (d) 32

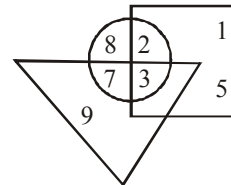
52. Keeping his back towards the rising sun, Reshma starts walking. After a few minutes, she turns left and keeps on walking. Then a little later she turns right and then left. In which direction is she going at the moment?

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

53. Seema's younger brother Sohan is older than Seeta. Sweta is younger than Deepti but elder than Seema. Who is the eldest ?

- (a) Seeta (b) Deepti
 (c) Seema (d) Sweta

54. In the given figure in a garden, square represent the area where jackfruit trees are grown, circle represent mango trees and triangle represent coconut trees. Which number represent the common area in which all types of trees are grown.



- (a) 4 (b) 3
 (c) 7 (d) 8

55. If a represents $\div$, 'b' represents $+$, 'c' represents $-$ and 'd' represents $\times$ then $24a 6d 4b 9c 8 = ?$

- (a) 6 (b) 17
 (c) 20 (d) 19

56. Mani is double the age of Prabhu. Ramona is half the age of Prabhu. If Mani is sixty, find out the age of Ramona.

- (a) 20 (b) 15
(c) 10 (d) 24

DIRECTIONS (Qs. 57-58) : In questions below, Select the missing number from the given responses.

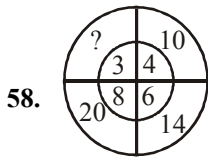
57.

	8	
6	54	7
	4	

	12	
8	51	4
	7	

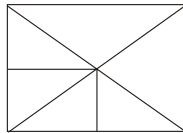
	14	
9	?	5
	9	

- (a) 53 (b) 71
(c) 76 (d) 68



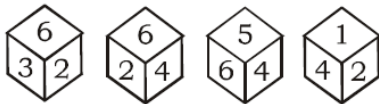
- (a) 24 (b) 12
(c) 18 (d) 19

59. How many triangles are there in the following figure?



- (a) 12 (b) 8
(c) 16 (d) 15

60. Four positions of a dice are given below. Find out the opposite surface of 6.



- (a) 2 (b) 3
(c) 1 (d) 5

DIRECTION: In question nos. 61 two statements are given followed by some conclusions. You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You are to decide which of the given conclusion, if any, follow from the given statements.

61. **Statements :**

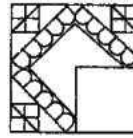
1. All students are doctors.
2. No doctor is leader.

Conclusions :

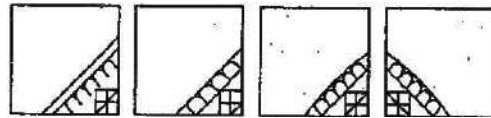
- I. All leaders are students.
 - II. Some doctors are students.
- (a) Only conclusion I follows
(b) Only conclusion II follows
(c) Both conclusions I and II follow
(d) Neither conclusion I nor II follows

DIRECTIONS (Qs. 62-63) : In questions below, which answer figure will complete the pattern in the question figure?

62. **Question figure :**



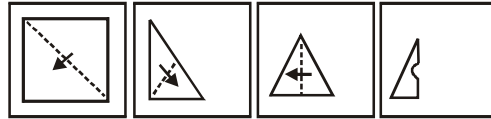
Answer figures :



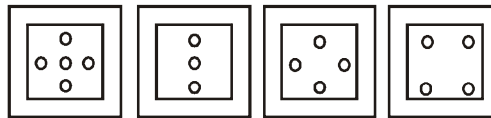
- (a) (b) (c) (d)

63. 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.

Question figure :



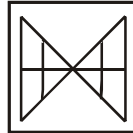
Answer figures:



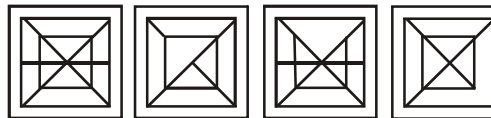
- (a) (b) (c) (d)

64. From the given answer figures, select the one in which the question figure is hidden/embedded.

Question figure :



Answer figures:



- (a) (b) (c) (d)

65. A word is represented by only one set of numbers as given in any one 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 are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, e.g., A can be represented by 01, 20, 42 etc. and H can be represented by 65, 57, 98 etc. Similarly, you have to identify the set for the word given in the question.

FAITH

Matrix-I

	0	1	2	3	4
0	F	A	N	O	I
1	I	O	F	A	N
2	A	N	O	I	F
3	O	F	I	N	A
4	N	I	A	F	O

Matrix-II

	5	6	7	8	9
5	S	E	H	B	T
6	H	S	E	T	B
7	B	T	S	E	H
8	E	H	T	B	S
9	T	S	E	H	B

- (a) 24, 31, 10, 59, 57 (b) 12, 20, 40, 68, 65
(c) 31, 34, 23, 76, 79 (d) 43, 42, 41, 78, 89
66. If in a certain language LATE is coded as 8 & 4 \$ and HIRE is coded as 7*3\$ then how will HAIL be coded in the same language ?
(a) 7 & 8* (b) &7*8
(c) 7*&8 (d) 7&*8
67. Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group ?
(a) Stem (b) Tree
(c) Root (d) Branch
68. If 'Apple' is called 'Orange', 'Orange' is called 'Peach', 'Peach' is called 'Potato', 'Potato' is called 'Banana', 'Banana' is called 'Papaya' and 'Papaya' is called 'Guava', which of the following grows underground ?
(a) Potato (b) Guava
(c) Apple (d) Banana

69. How many such pairs of letters are there in word ENGLISH, each of which has as many letters between its two letters as there are between them in the English alphabets ?

(a) None (b) One
(c) Two (d) More than three

DIRECTIONS (Qs. 70-72) : Read the following information carefully and answer the questions, which follow :

'A - B' means 'A is father of B'.

'A + B' means 'A is daughter of B'.

'A ÷ B' means 'A is son of B'.

'A × B' means 'A is wife of B'.

70. How is P related to T in the expression 'P + S - T' ?
(a) Sister (b) Wife
(c) Son (d) Daughter
71. In the expression 'P × Q - T' how is T related to P ?
(a) Daughter (b) Sister
(c) Mother (d) Can't be determined
72. Which of the following means T is wife of P ?
(a) $P \times S \div T$ (b) $P \div S \times T$
(c) $P - S \div T$ (d) None of these

DIRECTIONS (Q. 73-75) : Study the following arrangement carefully and answer the questions given below

D 5 δ R @ A K © 3 9 B J E F \$ M P I
4 H 1 W 6 2 # U Q 8 T N

73. How many such numbers are there in the above arrangement each of which is immediately preceded by a symbol and immediately followed by a letter ?
(a) None (b) One
(c) Two (d) Three
74. Which of the following is the ninth to the right of the twenty second from the right end of the above arrangement ?
(a) E (b) I (c) D (d) N
75. How many such symbols are there in the above arrangement each of which is immediately preceded by a number and immediately followed by a letter ?
(a) None (b) One
(c) Two (d) Three

DIRECTIONS (Q. 76-78) : Study the following arrangement carefully and answer the questions given below

M, D, K, R, T, H, W and A are sitting around a circle facing at the centre. D is second to the right of M who is fifth to the left of T. K is third to the right of R who is second to the right of D. H is second to the right of W.

76. Who is second to the right of A ?
 (a) M (b) D
 (c) K (d) Data inadequate
77. Who is third to the left of M ?
 (a) A (b) T
 (c) H (d) D
78. Who is fourth to the right of H ?
 (a) A (b) T
 (c) R (d) K
79. If all the numbers are dropped from the above arrangement, which of the following will be the eleventh from the left end?
 (a) B (b) H (c) \$ (d)
80. How many such consonants are there in the above arrangement each of which is immediately preceded by a number and immediately followed by another consonant ?
 (a) None (b) One
 (c) Two (d) Three

GENERAL AWARENESS

81. Who among the following had founded the Theosophical Society in the United States of America?
 (a) Swami Dayanand Saraswati
 (b) Madam Blavatsky
 (c) Madam Cama
 (d) Lala Hardayal
82. 'Freon' used as refrigerants is chemically known as
 (a) chlorinated hydrocarbon
 (b) fluorinated hydrocarbon
 (c) chlorofluoro hydrocarbon
 (d) fluorinated aromatic compound
83. The humidity of air measured in percentage is called
 (a) absolute humidity (b) specific humidity
 (c) relative humidity (d) all of these
84. In which of the following years was the first Railway line between Bombay and Thane laid?
 (a) 1853 (b) 1854 (c) 1856 (d) 1858
85. Which one of the following was the original name of Tansen, the famous musician in the court of Akbar?
 (a) Mahananda Pande (b) Lal Kalwant
 (c) Baz Bahadur (d) Ramtanu Pande
86. When the productive capacity of the economic systems of a state is inadequate to create sufficient number of jobs, it is called
 (a) seasonal unemployment
 (b) structural unemployment
 (c) disguised unemployment
 (d) cyclical unemployment
87. Who of the following constitutes a Finance Commission for a State in India?
 (a) The President of India
 (b) The Governor of the State
 (c) The Union Finance Minister
 (d) The Union Cabinet
88. Who drafted the Constitution of Muslim League, 'The Green Book'?
 (a) Rahamat Ali
 (b) Muhammad Iqbal
 (c) Muhammad Ali Jinnah
 (d) Maulana Muhammad Ali Jauhar
89. Bluetooth technology allows
 (a) wireless communications between equipments
 (b) signal transmission on mobile phones only
 (c) landline to mobile phone communication
 (d) satellite television communication
90. The 'Arthashastra' is a treatise on which one of the following?
 (a) Economics
 (b) Environment
 (c) Political Philosophy
 (d) Religion in Administration
91. Who among the following was the Viceroy of India at the time of the formation of Indian National Congress?
 (a) Lord Mayo (b) Lord Ripon
 (c) Lord Dufferin (d) Lord Lansdowne
92. As which one of the following, does carbon occur in its purest form in nature?
 (a) Carbon black (b) Graphite
 (c) Diamond (d) Coal
93. Whose philosophy is called the Advaita?
 (a) Ramanujacharya (b) Shankaracharya
 (c) Nagarjuna (d) Vasumitra
94. Special Drawing Rights [SDRs] relate to
 (a) the World Bank
 (b) the Reserve Bank of India
 (c) the World Trade Organisation
 (d) the International Monetary Fund
95. The income elasticity of demand for inferior goods is
 (a) less than one (b) less than zero
 (c) equal to one (d) greater than one
96. Which schedule of the Constitution of India contains the three lists that divide powers between the Union and the states?
 (a) Fifth (b) Sixth (c) Seventh (d) Eighth
97. In which part of the Constitution, details of citizenship are mentioned?
 (a) I (b) II (c) III (d) IV
98. In which one of the following Indian States is the game of polo said to have originated?
 (a) West Bengal (b) Meghalaya
 (c) Manipur (d) Sikkim

99. 'And Then One Day : A Memoir' is an autobiography of
 (a) Kamal Hasan (b) Shahrukh Khan
 (c) Naseeruddin Shah (d) Karan Johar
100. Which one of the following diseases is caused by virus?
 (a) Tuberculosis (b) Typhoid
 (c) Influenza (d) Diphtheria
101. Movement of cell against concentration gradient is called
 (a) osmosis (b) active transport
 (c) diffusion (d) passive transport
102. Prokaryotic cells lack
 (a) nucleolus
 (b) nuclear membrane
 (c) membrane bound by organelles
 (d) All of these
103. Plants that grow in saline water are called
 (a) halophytes (b) hydrophytes
 (c) mesophytes (d) thallophytes
104. The Juno spacecraft which successfully entered the Jupiter orbit recently belonged to which space agency?
 (a) National Aeronautics and Space Administration
 (b) European Space Agency
 (c) Japan Aerospace Exploration Agency
 (d) China National Space Administration
105. The 2016 National Doctors' Day that was observed recently is observed to honour which of the following legendary physicians?
 (a) Sushruta
 (b) Ronald Ross
 (c) Kadambini Ganguly
 (d) Bidhan Chandra Roy
106. How many options does a binary choice offer?
 (a) One
 (b) Two
 (c) Three
 (d) It depends on the amount of memory in the computer
107. Which menu is selected to cut, copy, and paste?
 (a) File (b) Edit
 (c) Tools (d) Table
108. Storage device, inside the computer is
 (a) CDROM (b) Zip Disk
 (c) Super Disk (d) Hard Disk
109. The indicates how much data a particular storage medium can hold.
 (a) access (b) capacity
 (c) memory (d) storage
110. If you are going to a site you use often, instead of having to type in the address every time, you should
 (a) save it as a file (b) make a copy of it
 (c) bookmark it (d) delete it
111. Through which of the following group of states does the Konkan Railways run?
 (a) Maharashtra - Karnataka - Andhra Pradesh - Kerala
 (b) Maharashtra - Karnataka - Goa - Kerala
 (c) Maharashtra - Karnataka - Kerala - Tamil Nadu
 (d) Karnataka - Goa - Kerala - Tamil Nadu
112. Which of the following zonal headquarters - city combination is incorrect?
 (a) South East Central - Bilaspur
 (b) North Western - Jodhpur
 (c) East Central - Hajipur
 (d) West Central - Jabalpur
113. Which of the following zones administers the Matheran Hill Railway?
 (a) Konkan Railways (b) Western Railways
 (c) Central Railways (d) Southern Railways
114. In which city is the Indian Railway Institute of Financial Management (IRIFM) being set up as announced in the Railway Budget 2013?
 (a) Secunderabad (b) Lucknow
 (c) Rae Bareilly (d) Gurgaon
115. In which of the following cities is the National Rail Museum located?
 (a) Mumbai (b) New Delhi
 (c) Hyderabad (d) Chennai
116. The Surrogacy (Regulation) Bill, 2016 was passed in Lok Sabha on November 21, 2016 by Health Minister of India. Who is the present Health Minister of India?
 (a) J P Nadda
 (b) Kalraj Mishra
 (c) Nitin Jairam Gadkari
 (d) Dr. Harsh Vardhan
117. Uttar Pradesh Chief Minister Akhilesh Yadav on November 21, 2016 inaugurated India's longest expressway between which two Indian cities?
 (a) Agra - Varanasi (b) Agra - Lucknow
 (c) Varanasi - Noida (d) Noida - Lucknow
118. Tiger National Parks Of Central India has been named under which category of 'Best of the World List 2017' by National Geographic?
 (a) Nature (b) Cities
 (c) Culture (d) Wildlife
119. 'Women in India: Unheard Stories' a virtual artwork and exhibition was organized by which firm on November 19 2016 ?
 (a) IBM (b) TCS
 (c) Google (d) Microsoft
120. The Indore-Patna Express train derailment accident on November 21, 2016 took place at which place of Kanpur Dehat?
 (a) Rania (b) Jhinjhak
 (c) Rura (d) Pukhrayan

Hints & Explanations

1. (b) From the given alternatives,

$$97 \times 98 = 9506$$

$$\therefore \text{Smaller number} = 97$$

2. (c) $9 \quad 2\sqrt{14} \quad \sqrt{7}^2 \quad \sqrt{2}^2 \quad 2\sqrt{7} \times \sqrt{2}$

$$= \sqrt{7} \quad \sqrt{2}^2$$

$$\therefore \quad \sqrt{9 \quad 2\sqrt{14}} \quad \sqrt{7} \quad \sqrt{2}$$

3. (d) Work done by the tap B in 1 min

$$= \frac{1}{40} - \frac{1}{60} = \frac{3-2}{120} = \frac{1}{120}$$

Total time taken by the tap B to fill the tank is 120 min.

4. (a) Required no. of ways

$$= {}^2P_2 \times {}^4P_4 = 48$$

5. (c) When 2nd train starts i.e. at 7 AM (1 hr after 6 AM), distance covered by first train is 60 km (i.e. in 1 hr).

Now 2nd train also starts and distance between them is now $(480-60) = 420$ km

Both coming in opposite direction, so relative speed $= (60+80) = 140$ km/hr

So time $= 7:00 \text{ AM} + (420/140) = 7:00 \text{ AM} + 3 \text{ hrs} = 10:00 \text{ AM}$

6. (d) Cost price of TV when discount is not offered

$$= 11250 \times \frac{100}{90} = ₹12500$$

Total cost of TV after transport and installation

$$= 12500 + 800 + 150 = ₹13450$$

To earn 15% profit, he must sell at

$$13450 \times \frac{115}{100} = ₹15467.50$$

7. (b) Given, $P:Q = \frac{3}{5} : \frac{5}{7}$... (i)

$$Q:R = \frac{3}{4} : \frac{2}{5} \quad \dots \text{(ii)}$$

From Eq. (i),

$$P:Q = \frac{3}{5} \times \frac{3}{4} : \frac{5}{7} \times \frac{3}{4}$$

$$= \frac{9}{20} : \frac{15}{28} \quad \dots \text{(iii)}$$

From Eq. (ii),

$$Q:R = \frac{3}{4} \times \frac{5}{7} : \frac{2}{5} \times \frac{5}{7}$$

$$= \frac{15}{28} : \frac{2}{7} \quad \dots \text{(iv)}$$

From equations (iii) and (iv),

$$P:Q:R = \frac{9}{20} : \frac{15}{28} : \frac{2}{7}$$

8. (d)

9. (a) $\frac{2}{3} \times \frac{3}{4} \times \frac{1}{5} \times a = 15$; $a = \text{Number}$

$$\Rightarrow a = 150$$

$$\text{Then } 30\% \text{ of } a = \frac{30}{100} \times 150 = 45$$

10. (c) Circumference of the circle $= \pi \times \text{diameter}$

$$= \frac{22}{7} \times 56 = 176 \text{ cm}$$

$\therefore$ Perimeter of the square

$$= (272 - 176) = 96 \text{ cm}$$

$\therefore$ Side of the square

$$= \left(\frac{96}{4} \right) = 24 \text{ cm}$$

$\therefore$ Area of the square

$$= (24 \times 24) = 576 \text{ sq cm}$$

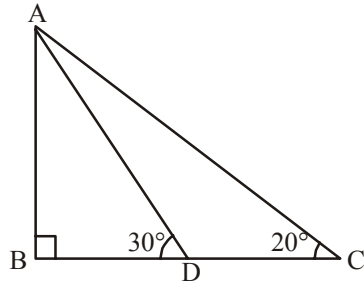
$\therefore$ Area of the circle $= \pi r^2$

$$= \frac{22}{7} \times 28 \times 28 = 2464 \text{ sq cm.}$$

$\therefore$ Required sum

$$= (576 + 2464) \text{ sq cm} = 3040 \text{ sq cm}$$

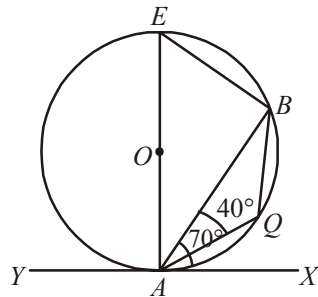
11. (a) In
- $\triangle ADC$
- ,



$$\angle ADC = 180^\circ - 30^\circ = 150^\circ$$

$$\therefore \angle DAC = 180^\circ - (150^\circ + 20^\circ) = 10^\circ$$

12. (b) Given,
- $\angle BAX = 70^\circ$
- and
- $\angle BAQ = 40^\circ$



$$\angle QAX = 70^\circ - 40^\circ = 30^\circ$$

$$\therefore \angle EAX = 90^\circ$$

$$\Rightarrow \angle EAB = 90^\circ - 70^\circ = 20^\circ$$

Since, $AQBE$ is a cyclic quadrilateral.

$$\therefore \angle EAQ + \angle EBQ = 180^\circ$$

$$\Rightarrow \angle EBQ = 180^\circ - 60^\circ = 120^\circ$$

$$\text{But } \angle EBA = 90^\circ$$

$$\therefore \angle ABQ = 120^\circ - 90^\circ = 30^\circ$$

13. (c) Here,
- $r_1 = 9$
- cm and
- $r_2 = 4$
- cm

$$r_1 + r_2 = 9 + 4 = 13 \text{ cm}$$

$$\text{and } r_1 - r_2 = 9 - 4 = 5 \text{ cm}$$

$$\text{Also, } d = 13 \text{ cm}$$

$$\text{Here, } d = r_1 + r_2 = 13 \text{ cm}$$

Hence, two circles touch each other externally, so there are three common tangents.

14. (c) If a parallelogram and a rectangle stand on the same base and on the same side of the base with the same height, then perimeter of parallelogram is greater than perimeter of rectangle.

$$\therefore I_1 > I_2$$

15. (c) Given,
- $3.7^x = 0.037^y = 10000$

$$\Rightarrow 3.7^x = 10^4 \text{ and } 0.037^y = 10^4$$

$$\Rightarrow 37 \cdot 10^{\frac{4}{x}} = 1 \text{ and } 37 \cdot 10^{\frac{4}{y}} = 3$$

$$\Rightarrow 10^{\frac{4}{x}} = 10^{\frac{4}{y}} \Rightarrow \frac{4}{x} = \frac{4}{y} \Rightarrow \frac{4}{x} = \frac{4}{y} \Rightarrow \frac{4}{x} = \frac{4}{y}$$

$$\therefore \frac{4}{x} - \frac{4}{y} = 3 - 1 \Rightarrow \frac{1}{x} - \frac{1}{y} = \frac{1}{2}$$

16. (c) Given,
- $3^x + 27(3^{-x}) = 12$

$$\text{Let } 3^x = y$$

$$\therefore y + \frac{27}{y} = 12$$

$$\Rightarrow y^2 - 12y + 27 = 0$$

$$\Rightarrow y^2 - 9y - 3y + 27 = 0$$

$$\Rightarrow (y - 3)(y - 9) = 0 \Rightarrow y = 3, 9$$

$$\text{when } y = 3;$$

$$\text{when } y = 9$$

$$\Rightarrow 3^x = 3$$

$$3^x = 9$$

$$\therefore x = 1$$

$$x = 2$$

$x = 1, 2$ are value of x .

17. (c) Given that,
- $\sin^2 x + \cos^2 x - 1 = 0$

$$\Rightarrow \sin^2 x + \cos^2 x = 1$$

which is an identity of trigonometric ratio and always true for every real value of x .

Therefore, the equation has an infinite solution.

18. (c)
- $\cos A = \tan B$

Squaring on both sides

$$\cos^2 A = \tan^2 B$$

$$\Rightarrow \tan^2 B = \frac{\sin^2 B}{\cos^2 B} = \frac{1 - \cos^2 B}{\cos^2 B}$$

$$\therefore \cos^2 A = \frac{1 - \cos^2 B}{\cos^2 B}$$

$$\cos^2 A = \frac{1 - \tan^2 C}{\tan^2 C}$$

$$\therefore \cos B = \tan C$$

$$\Rightarrow \cos^2 A \tan^2 C = 1 - \tan^2 C = 1 - \frac{\sin^2 C}{\cos^2 C}$$

$$\Rightarrow \cos^2 A \frac{\sin^2 C}{\cos^2 C} = \frac{\cos^2 C - \sin^2 C}{\cos^2 C}$$

$$\Rightarrow \cos^2 A (1 - \cos^2 C) = 2 \cos^2 C - 1$$

$$\Rightarrow \cos^2 A (1 - \tan^2 A) = 2 \tan^2 A - 1$$

$$\cos^2 A - \sin^2 A = \frac{2 \sin^2 A}{\cos^2 A} - 1$$

$$\Rightarrow 1 - 2 \sin^2 A = \frac{2 \sin^2 A - \cos^2 A}{\cos^2 A}$$

$$\Rightarrow \cos^2 A (1 - 2 \sin^2 A) = 2 \sin^2 A - \cos^2 A$$

$$\Rightarrow \cos^2 A (1 - 2 \sin^2 A) = 2 \sin^2 A - 1 + \sin^2 A$$

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

$$\Rightarrow 1 - 2 \sin^2 A - \sin^2 A + 2 \sin^4 A = 3 \sin^2 A - 1$$

$$\Rightarrow 1 - 3 \sin^2 A + 2 \sin^4 A = 3 \sin^2 A - 1$$

$$\Rightarrow 2 \sin^4 A - 6 \sin^2 A + 2 = 0$$

$$\Rightarrow \sin^4 A - 3 \sin^2 A + 1 = 0$$

This is quadratic equation in $\sin^2 A$

$$(\sin^2 A)^2 - 3 (\sin^2 A) + 1 = 0$$

$$\sin^2 A = \frac{3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot 1}}{2}$$

$$\frac{3 \pm \sqrt{5}}{2}$$

$$\sin^2 A = \frac{3 \pm \sqrt{5}}{2} \text{ not possible because}$$

$$\sin^2 A \neq 1$$

$$\text{So } \sin^2 A = \frac{3 - \sqrt{5}}{2}$$

So none of the options are correct.

19. (b) $\sin x + \cos x = c$ (i)

Squaring both sides.

$$\Rightarrow \sin^2 x + \cos^2 x + 2 \sin x \cos x = c^2$$

$$\Rightarrow \sin x \cos x = \frac{c^2 - 1}{2} \quad \dots \text{(ii)}$$

Now, cubing eqn (i) both sides

$$\Rightarrow \sin^3 x + \cos^3 x + 3 \sin x \cos x (\sin x + \cos x) = c^3$$

$$\Rightarrow \sin^3 x + \cos^3 x + 3 \cdot \frac{(c^2 - 1)}{2} \times c = c^3$$

$$\Rightarrow \sin^3 x + \cos^3 x = c^3 - \frac{3}{2} (c^2 - 1) c$$

$$\Rightarrow \sin^3 x + \cos^3 x = c^3 - \frac{3c^3 - 3c}{2}$$

$$\sin^3 x - \cos^3 x = \frac{3c - c^3}{2} \quad \dots \text{(iii)}$$

On squaring both sides.

$$\Rightarrow \sin^6 x + \cos^6 x + 2 \sin^3 x \cos^3 x = \frac{(3c - c^3)^2}{4}$$

$$\Rightarrow \sin^6 x + \cos^6 x + 2$$

$$\left\{ \frac{(c^2 - 1)}{2} \right\}^3 \frac{9c^2 - c^6 - 6c^4}{4}$$

$$\Rightarrow \sin^6 x + \cos^6 x =$$

$$\frac{9c^2 - c^6 - 6c^4 - c^6 - 1 - 3c^2(c^2 - 1)}{4}$$

$$\sin^6 x + \cos^6 x = \frac{1 - 6c^2 + 3c^4}{4}$$

20. (d) No of persons from village C
= 32% of 5800 = 1856
From village C 50% of 1856 = 928 persons
favourite fruit is mango.
28% of 5800 = 1624 people's favourite fruit
is mango

$$\therefore \text{Required \%} = \frac{928}{1624} \times 100 \approx 57\%$$

21. (d) People in village D = 25% of 5800 = 1450

$$\therefore \text{Required no. of people} \\ = \{100 - (20 + 12)\} \% \text{ of } 1450 \\ = 68\% \text{ of } 1450 = 986$$

22. (c) Required no. = 15% of 5800 = 870

23. (a) $\therefore$ Volume of pipe, $V = \pi r_1^2 - r_2^2 \times h$

$$= \frac{22}{7} [(3.5)^2 - (2.5)^2] \times 140$$

$$= \frac{22}{7} (12.25 - 6.25) \times 140$$

$$= 22 \times 6 \times 20 = 2640 \text{ cu cm}$$

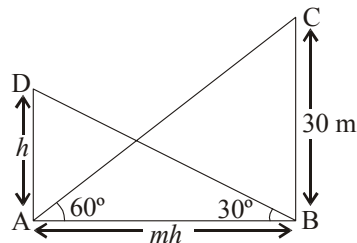
24. (c) Volume of solid cube = $(4)^3 = 64 \text{ cm}^3$

$$\text{Volume of recast cube} = (1)^3 = 1 \text{ cm}^3$$

$\therefore$ Total surface area of cube : Total surface area of recast cube = $x : y$

$$\Rightarrow x : y = 6(4)^2 : 6(1)^2 \times 64 = 1 : 4$$

25. (b) Let the height of shorter tower be h then distance between two tower = hm .



- In $\triangle ABD$, $\tan 30^\circ = \frac{h}{mh} \Rightarrow \frac{1}{\sqrt{3}} = \frac{1}{m}$
 $\therefore m = \sqrt{3}$
26. (b) Let the number be x .
 Then $x - 60\%$ of $x = 60$
 $\Rightarrow x - 0.60x = 60 \Rightarrow 0.4x = 60$
 $\Rightarrow x = \frac{60}{0.4} \Rightarrow x = \frac{600}{4}$
 $x = 150$
 $\therefore$ The number is 150.
27. (b) $\therefore \sqrt{110.25} \times \sqrt{0.01} \div \sqrt{0.0025} - \sqrt{420.25}$
 $= 10.5 \times \frac{0.1}{0.05} - 20.5 = \frac{1.05}{0.05} - 20.5 = 21 - 20.5$
 $= 0.5$
28. (c) The traffic lights will again change at three different road crossings simultaneously after the LCM of 48, 72 and 108
 i.e., after every (432 sec) 7 minutes and 12 seconds, i.e. the earliest at 8 : 27 : 12 hours.
29. (b) Actual average marks
 $= \frac{65 \times 150 + 152 - 142}{65} = \frac{9750 - 10}{65} = 150.15$
30. (d) C. P. for 50 pencils = ₹ 100
 $\therefore$ C. P. for 45 pencils = $\frac{100}{50} \times 45 = ₹ 90$
 $=$ S.P. of 45 pencils
 $\therefore$ No gain, no loss
31. (c) $x : \frac{1}{27} = \frac{3}{11} : \frac{5}{9}$ or, $27x = \frac{3 \times 9}{11 \times 5} \therefore x = \frac{1}{55}$
32. (b) Ratio of times taken by A and B = 100 : 130 = 10 : 13.
 Suppose B takes x days to do the work.
 Then, 10 : 13 :: 23 : x
 $\Rightarrow x = \left(\frac{23 \times 13}{10} \right) \Rightarrow x = \frac{299}{10}$
 A's 1 day's work = $\frac{1}{23}$; B's 1 day's work
 $= \frac{10}{299}$
 (A + B)'s 1 day's work
 $= \left(\frac{1}{23} + \frac{10}{299} \right) = \frac{23}{299} + \frac{1}{13}$
 $\therefore$ A and B together can complete the job in 13 days.
33. (c) After 5 minutes (before meeting), the top runner covers 2 rounds i.e., 400 m and the last runner covers 1 round i.e., 200 m.
 $\therefore$ Top runner covers 800 m race in 10 minutes.
34. (c) Clearly, we have : $l = 9$ and $l + 2b = 37$ or $b = 14$.
 $\therefore$ Area = $(l \times b) = (9 \times 14)$ sq. ft. = 126 sq. ft.
35. (c) Retailer price = list price
 $\left(1 - \frac{d_1}{100} \right) \left(1 - \frac{d_2}{100} \right)$
 $\Rightarrow 122.40 = 160 \left(1 - \frac{10}{100} \right) \left(1 - \frac{d_2}{100} \right)$
 $\Rightarrow 1 - \frac{d_2}{100} = \frac{122.40 \times 100}{160 \times 90} = 0.85$
 $\Rightarrow d_2 = (1 - 0.85) \times 100 = 15\%$
36. (d) Let the time be t hours after 6 am.
 $\therefore \frac{1}{15} \times t = \frac{(t-1)}{20} = \frac{(t-2)}{30} = \frac{(t-3)}{60} = 1$
 $\therefore 4t + 3(t-1) + 2(t-2) + (t-3) = 60$
 $\therefore t = 7$ hours $\therefore$ It is filled at 1 pm
37. (c) Let the speed of the cars be x km/h and y km/h, respectively.
 Their relative speeds when they are moving in same direction = $(x - y)$ km/h.
 Their relative speeds when they are in opposite directions = $(x + y)$ km/h.
 Now, $\frac{70}{x - y} = 1$ or $x + y = 70$ (i)
 and $\frac{70}{(x - y)} = 7$ or $x - y = 10$ (ii)
 Solving (i) and (ii), we have
 $x = 40$ km/h and $y = 30$ km/h.
38. (b) $3x + 7 = 7x + 5 \Rightarrow 7x - 3x = 2 \Rightarrow 4x = 2$
 $\Rightarrow x = \frac{1}{2}$
 Now, $3x + 7 = x^2 + P$
 $\Rightarrow \frac{3}{2} + 7 = \frac{1}{4} + P$
 $\Rightarrow P = \frac{17}{2} - \frac{1}{4} = \frac{33}{4} = 8\frac{1}{4}$
39. (b) $x^2 - 3x + 1 = 0$
 $\Rightarrow x^2 + 1 = 3x \Rightarrow x + \frac{1}{x} = 3$

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

$$= 27 - 3 \times 3 = 18$$

40. (d) Given, $x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta$... (i)
and $x \sin \theta - y \cos \theta = 0$... (ii)

From Eq. (ii),

$$x \sin \theta = y \cos \theta$$

From Eq. (i)

$$y \cos \theta \cdot \sin^2 \theta + y \cos^3 \theta = \sin \theta \cos \theta$$

$$y \cos \theta (\sin^2 \theta + \cos^2 \theta) = \sin \theta \cos \theta$$

$$y = \sin \theta$$

From Eq. (i)

$$x = \cos \theta$$

$$\therefore x^2 + y^2 = \sin^2 \theta + \cos^2 \theta = 1$$

41. (d) A palace is the official home of a King.
Similarly,
An igloo is a small round house of an Eskimo.

42. (c) $A \xrightarrow{5} F \xrightarrow{5} K \xrightarrow{5} P$
 $D \xrightarrow{5} I \xrightarrow{5} N \xrightarrow{5} S$
 $W \xrightarrow{5} B \xrightarrow{5} G \xrightarrow{5} L$
 $O \xrightarrow{5} T \xrightarrow{5} Y \xrightarrow{5} D$

43. (d) $12 : 20 :: \boxed{30} : \boxed{42}$
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
 $(3 \times 4) \quad (4 \times 5) \quad (5 \times 6) \quad (6 \times 7)$

44. (a) All others except (a) are prime numbers.
45. (b) Lotus grows in the water but rest grow on the land.

46. (c) $B \xrightarrow{+2} D \xrightarrow{+2} F, C \xrightarrow{+3} F \xrightarrow{+3} I, D \xrightarrow{+4} H \xrightarrow{+4} L,$
 $E \xrightarrow{+5} J \xrightarrow{+5} O$

47. (b) Each of the numbers is doubled and 1, 2, 3, 4, 5, 6 is added in turn, so $89 \times 2 + 6 = 184$.

48. (a) $\begin{array}{cccc} 1 & 2 & 3 & 4 \\ \boxed{DEPU} & \boxed{TA} & \boxed{TI} & \boxed{ON} \end{array}$
Coded $\rightarrow \begin{array}{cccc} \boxed{ON} & \boxed{TA} & \boxed{DEPU} & \boxed{TI} \\ 4 & 2 & 1 & 3 \end{array}$

Similarly,

$\begin{array}{cccc} 1 & 2 & 3 & 4 \\ \boxed{DERI} & \boxed{VA} & \boxed{TI} & \boxed{ON} \end{array}$

Coded $\rightarrow \begin{array}{cccc} \boxed{ON} & \boxed{VA} & \boxed{DERI} & \boxed{TI} \\ 4 & 2 & 1 & 3 \end{array}$

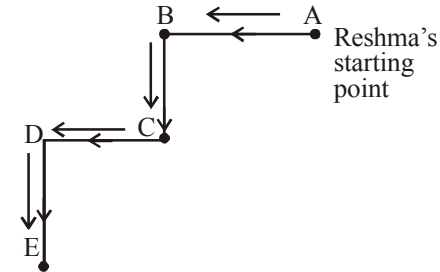
49. (b)

$\begin{array}{ccccccccc} 5 & & 1 & & 3 & & 2 & & 4 \\ \text{Force} & \rightarrow & \text{Forecast} & \rightarrow & \text{Foreign} & \rightarrow & \text{Forget} & \rightarrow & \text{Forsook} \end{array}$

50. (a) The sequence is : $\underline{a} \underline{b} \underline{c} \underline{d} \underline{d} \underline{a} \underline{b} \underline{c} \underline{d} \underline{d} \underline{a} \underline{b} \underline{c}$.

51. (d) Clearly, number of students in the class
 $= (6 + 1 + 25) = 32$

52. (b)



Now, Reshma is going to south direction

53. (b) Seema > Sohan > Seeta ... (i)
Deepti > Sweta > Seema ... (ii)

Combining (i) and (ii) we get

Deepti > Sweta > Seema > Sohan > Seeta

54. (b) 3 represents the area common to all types.

55. (b) $24 \div 6 \times 4 + 9 - 8$

$$4 \times 4 + 9 - 8$$

$$16 + 9 - 8$$

$$25 - 8 = 17$$

56. (b) Mani's Age = 60 years
Prabhu's Age = $60/2 = 30$ years
Romana's Age = $30/2 = 15$ years

57. (d) $14 + 9 = 23$

$$9 \times 5 = 45$$

$$23 + 45 = 68$$

58. (d) $3 + 4 + 3 = 10$

$$4 + 6 + 4 = 14$$

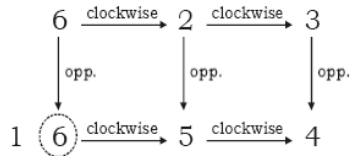
$$8 + 6 + 6 = 20$$

$$8 + 3 + 8 = 19$$

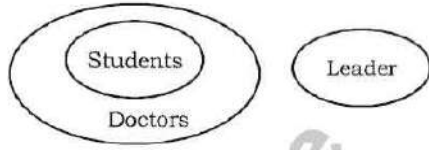
59. (a)

These are twelve triangles in the above figure – ABE, AFE, DFE, DGE, GCE, CBE, ABC, DBC, DAB, ADC, AED and CED

60. (c) According to the dice I and III



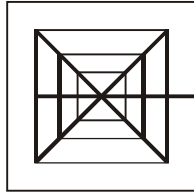
61. (b)



Conclusion- I. x
II. ✓

62. (c) 63. (c)

64. (a)



65. (c) F A I T H
↓ ↓ ↓ ↓ ↓
31 34 23 76 79

66. (d) As L → 8 and H → 7
A → & I → *
T → 4 R → 3
E → \$ E → \$

Similarly,

H → 7
A → &
I → *
L → 8

67. (b) Others related to 'parts of tree'.
68. (d) Since 'Potato' is called Banana. Thus, 'Banana' grows underground.
69. (d) EI, EG, GI and NL.
70. (a) $P + S \rightarrow P$ is daughter of S.
 $S - T \rightarrow S$ is father of T.
Therefore, P is sister of T.
71. (d) $P \times Q \rightarrow P$ is wife of Q.
 $Q - T \rightarrow Q$ is father of T.
T is child of P and Q.
The gender of T is not known.
T is either son or daughter of P.

72. (d) $P \times S \rightarrow P$ is wife of S.
 $S \div T \rightarrow S$ is son of T.
T is either father-in-law or mother-in-law of P.
 $P \div S \rightarrow P$ is son of S.
 $S \times T \rightarrow S$ is daughter of T.
Therefore, T is father of P.
 $P - S \rightarrow P$ is father of T.
 $P + T \rightarrow P$ is daughter of T.
 $T \div S \rightarrow T$ is son of S.
Therefore, T is father of P.

73. (a) 74. (b) 75. (c) 76. (c)
77. (b) 78. (a) 79. (d) 80. (c)
81. (b) The Theosophical Society was formed by Helena Petrovna Blavatsky, Henry Steel Olcott, William Quan Judge and others in November 1875 in New York. The aim of the society was to promote spiritual principles and search for truth known as Theosophy.
82. (c) Chlorofluoro carbon (CF_2Cl_2) is also known as freon. It is used as refrigerants in refrigerators and air conditions. It is also used as propellant in aerosols and foams.
83. (c) The amount of water vapour in the air at any given time is usually less than that required to saturate the air. The relative humidity is the percent of saturation humidity, generally calculated in relation to saturated vapour density.

$$\text{Relative Humidity} = \frac{\text{actual vapor density}}{\text{saturation vapor density}} \times 100\%$$

84. (a) The country's first railway, built by the Great Indian Peninsula Railway (GIPR), opened in 1853 between Bombay and Thane.
85. (d) Tansen, who was one of the nine jewels or navaratnas in the court of Emperor Akbar, was born in a Hindu family at Behat near Gwalior in the Madhya Pradesh state. Father of Tansen was Makarand Pande, who named him Ramtanu Pandey.
86. (d) Cyclical unemployment is unemployment that results when the overall demand for goods and services in an economy cannot support full employment. It occurs during periods of slow economic growth or during periods of economic contraction.

87. (b) According to Article 243 (I) the governor of the state shall set up the Finance Commission within the period of one year. State Finance Commissions receive grants from the Finance Commission that is set up by the central government.
88. (c) Muhammad Ali Jinnah drafted the constitution of Muslim league 'The green Book'.
89. (a) Bluetooth technology allows wireless communications between equipments.
90. (c) The Arthasastra 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.
91. (c) Lord Dufferin was the Viceroy of India at the time of the formation of Indian National Congress.
92. (c) Diamond occurs in its purest form of carbon black in nature.
93. (b) Shankaracharya philosophy is called Advaita. The Advaita Vedanta focuses on the basic concepts as Brahman, atman, vidya (knowledge), avidya (ignorance), maya, karma and moksha.
94. (d) Special Drawing Rights (SDRs) are an international type of monetary reserve currency, created by the International Monetary Fund (IMF) in 1969, which operate as a supplement to the existing reserves of member countries.
95. (b) Inferior goods have a negative (less than 0) income elasticity of demand meaning that demand falls as income rises.
96. (c) 7th Schedule gives allocation of powers and functions between Union & States. It contains 3 lists:
Union List (97 Subjects)
States List (66 Subjects)
Concurrent List (52 Subjects)
97. (b) Details of Citizenship are mentioned in part II (Article 5-11) of the constitution.
98. (c) The origins of the game in Manipur are traced to early precursors of Sagol Kangjei. This was one of three forms of hockey in Manipur, the other ones being field hockey (called Khong Kangjei) and wrestling-hockey (called Mukna Kangjei). In Manipur, polo is traditionally played with seven players to a side.
99. (c) This is the autobiography of Naseeruddin Shah.
100. (c) Influenza is caused by virus and all other three diseases are bacterial, Influenza, generally called flu, is an infectious disease caused by RNA viruses of family Orthomyxoviridae.
101. (b) 102. (d) 103. (a) 104. (a)
105. (d) 106. (b) 107. (b) 108. (d)
109. (b) 110. (c) 111. (b) 112. (b)
113. (c) 114. (a) 115. (b)
116. (a) The Surrogacy (Regulation) Bill, 2016 was introduced by Health Minister JP Nadda in the Lok Sabha on November 21, 2016 to ban commercial surrogacy, aimed to protect women from exploitation and ensure the rights of the child born through surrogacy.
117. (b) Uttar Pradesh Chief Minister Akhilesh Yadav on November 21, 2016, inaugurated the six-lane Greenfield Agra-Lucknow Expressway at Bangarmau in Unnao district of Uttar Pradesh in presence of Samajwadi Party chief Mulayam Singh Yadav.
118. (a) National Geographic Traveler magazine announced its annual Best of the World list in 3 categories such as Cities, Nature, or Culture. India has been named under the category of nature in the list.
119. (c) Google with the help of its cultural arm Google Arts & Culture launched a virtual artwork and exhibition on November 19, 2016, 'Women in India: Unheard Stories', a special project consisting of about 50 artworks and virtual exhibitions on the life of Indian women in history from past 2,500 years and from 26 cultural institutions across the country with more than 1,800 artworks, showcasing the achievements of the Indian women in the country.
120. (d) The Indore-Patna Express train derailed in Kanpur Dehat district of Uttar Pradesh early morning about 3.10am on November 21, 2016 with nearly 133 people killed and more than 200 injured when 14 coaches of the express train derailed near Pukhrayan, about 100 km from Kanpur.