

# General Knowledge Sample Paper - 1

## SECTION-III : GENERAL TEST

1. Chemical formula of washing soda is
  - (a)  $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$
  - (b)  $\text{NaHCO}_3$
  - (c)  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
  - (d)  $\text{Ca}(\text{OH})_2$
2. Hydrochloric acid is also known as
  - (a) Galic acid
  - (b) Picric acid
  - (c) Muriatic acid
  - (d) Chloric acid
3. Kanchenzunga National Park is located at
  - (a) Uttar Pradesh
  - (b) West Bengal
  - (c) Sikkim
  - (d) Jammu and Kashmir
4. Biosphere Reserve of India Nanda Devi (UNESCO) is located in the state of
  - (a) Uttarakhand
  - (b) Sikkim
  - (c) Meghalaya
  - (d) Himachal Pradesh
5. The first oil refinery in India was set up at
  - (a) Barauni
  - (b) Vishakhapatnam
  - (c) Digboi
6. The chemical name of baking soda is
  - (a) Sodium carbonate
  - (b) Sodium bicarbonate
  - (c) Sodium chloride
  - (d) Sodium nitrate
7. The fourteen major banks in India were nationalised in the year
  - (a) 1967
  - (b) 1968
  - (c) 1969
  - (d) 1971
8. One rupee notes are issued by the
  - (a) Reserve Bank of India
  - (b) State Bank of India
  - (c) President of India
  - (d) Government of India
9. The name of the train "Shatabdi Express" refers to the centenary of
  - (a) Mahatma Gandhi
  - (b) Indian National Congress
  - (c) India's War of Independence
  - (d) Jawaharlal Nehru
10. Which one of the following is not a rabi crop?
  - (a) Mustard
  - (b) Rice
  - (c) Wheat
  - (d) Gram
11. India opened Zokhawthar immigration check-post in Mizoram on September 1, 2018. This check post has been set up along the border of which country?
  - (a) China
  - (b) Bangladesh
  - (c) Nepal
  - (d) Myanmar
12. "Mumbai High" is associated with
  - (a) Steel
  - (b) Petroleum
  - (c) Mausoleum
  - (d) Jute
13. How much of India's total geographical area is forest land?
  - (a) 20%
  - (b) 23%
  - (c) 26%
  - (d) 28%
14. What is the maximum gap permissible between two sessions of Parliament?
  - (a) One month
  - (b) Three months
  - (c) Six months
  - (d) Twelve months
15. When were the Fundamental Duties incorporated in the Constitution?
  - (a) 1975
  - (b) 1976
  - (c) 1977
  - (d) 1979
16. Where was the 4th Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) Summit held on 30th and 31st August 2018?
  - (a) Kathmandu, Nepal
  - (b) Beijing, China
  - (c) New Delhi, India
  - (d) Moscow, Russia
  - (e) None of these
17. Varahamihira was
  - (a) An Astronaut
  - (b) A Space Shuttle
  - (c) A Power Station
  - (d) An Ancient Astronomer
18. Rift Valley is formed
  - (a) between two anticlines
  - (b) between two faults
  - (c) erosion of synclinal basin
  - (d) due to volcanic eruption
19. How many judges are there in Supreme Court?
  - (a) 25
  - (b) 26
  - (c) 30
  - (d) 31
20. During the reign of Bindusara there was unrest at
  - (a) Ujjayani
  - (b) Pushkalavati
  - (c) Taxila
  - (d) Rajagriha
21. Resin is a product of
  - (a) Grapes
  - (b) Coniferous trees
  - (c) Rubber tree
  - (d) Banyan tree
22. An instrument used to measure the density of milk is
  - (a) Galactometer
  - (b) Lactometer
  - (c) Calciometer
  - (d) Polarimeter
23. While ascending a hill, the driver of the vehicle keeps the gear ratio
  - (a) equal to 1
  - (b) less than 1
  - (c) greater than 1
  - (d) either equal to or greater than 1
24. Which component is mainly responsible for doing calculation in computer?
  - (a) Random access memory
  - (b) Control unit
  - (c) Arithmetic logic unit
  - (d) Hard disk
25. A wire of resistance R is cut into 'n' equal parts. These parts are then connected in parallel. The equivalent resistance of the combination will be
  - (a) nR
  - (b)  $\frac{R}{n}$
  - (c)  $\frac{n}{R}$
  - (d)  $\frac{R}{n^2}$

Directions (Q. 26-29): Select the related word/letters/number from the given alternatives.

26. School : Teacher :: Hospital : ?  
 (a) Clerk (b) Doctor  
 (c) Student (d) Patient
27. JY : 35 :: RT : ?  
 (a) 48 (b) 38  
 (c) 35 (d) 24
28. AD : N :: BD : ?  
 (a) P (b) X  
 (c) Y (d) Z
29. 97 : 2 :: 84 : ?  
 (a) 4 (b) 3  
 (c) 6 (d) 5

Directions (Q. 30-33) : Select the odd word/letters/number/number pair from the given alternatives.

30. (a) Niece (b) Nephew  
 (c) Aunt (d) Sister
31. (a) AE (b) IM  
 (c) UA (d) GK
32. (a) 17 (b) 23  
 (c) 29 (d) 33
33. (a) 7214 (b) 3618  
 (c) 3519 (d) 9436

Directions (Q. No. 34-36): A series is given with one term missing. Choose the correct alternative from the given ones that will complete the series.

34. ?, HI, OP, WX  
 (a) AB (b) BC  
 (c) DE (d) EF
35. 144, 256, 400, ?  
 (a) 441 (b) 576  
 (c) 625 (d) 289
36. 5, 7.5, 12.5, 22.5, ?  
 (a) 42.5 (b) 42  
 (c) 44 (d) 43.5

37. In the following question, two statements are given each 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, follows from the given statements.

Statements:

- (I) All shawls are carpets.  
 (II) No carpet is a pullover.

Conclusion:

- (I) No shawls are pullovers.  
 (II) All carpets are shawls.  
 (a) Conclusion I follows  
 (b) Conclusion II follows  
 (c) Neither I nor II follows  
 (d) Both I and II follows
38. Vineet is taller than Raman but shorter than Jyoti. Sumit is the shortest. Deepak is taller than Sumit but shorter than Raman. Who is the tallest?  
 (a) Jyoti (b) Raman  
 (c) Vineet (d) Deepak
39. Arrange the given words in the sequence in which they occur in the dictionary.  
 i. Rainbow ii. Rancour  
 iii. Rattle iv. Rainy  
 (a) i, iii, ii, iv (b) i, iv, ii, iii  
 (c) i, iv, iii, ii (d) ii, i, iv, iii
40. In a certain code language, "BORROW" is written as "769965" and "BOMB" is written as "7647". How is "WOMB" written in that code language?  
 (a) 5647 (b) 5467  
 (c) 5677 (d) 5776

41. In the following question, select the missing number from the given series.

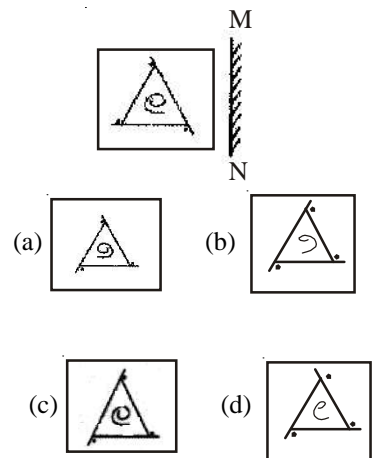
5	15	10
4	17	9
10	?	10

- (a) 11 (b) 12  
 (c) 15 (d) 10

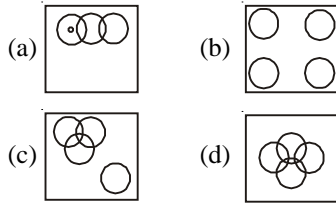
42. If "A" denotes "multiplied by", "B" denotes "subtracted from", "C" denotes "added to" and "D" denotes "divided by", then

$$7 B 17 C 88 D 11 A 6 = ?$$

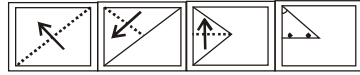
- (a) 27 (b) 28  
 (c) 38 (d) 26
43. Which set of letters when sequentially placed at the gaps in the given letter series shall complete it?  
 A \_ B C \_ B B C \_ B B \_  
 (a) BAAC (b) BBBC  
 (c) BABA (d) ABBC
44. Rahul moves 5 km towards south and then takes a left turn to move 5 km more. Again, he takes a left turn and moves 10 km and finally, he moves 5 km towards west. In which direction is he now from his initial position?  
 (a) West (b) East  
 (c) South (d) North
45. Johnny's father is the brother-in-law of Nisha's only sister. How is Johnny related to Nisha?  
 (a) Son (b) Grandson  
 (c) Father (d) Cousin
46. If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?



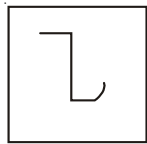
47. The diagram that identifies best representation of the relationship among the given classes.  
 Doctor, Smoker, Indian, Non-Smoker



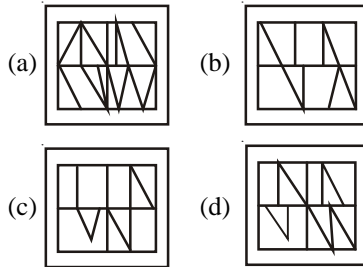
48. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.



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



Answer figures:



50. A word is represented by only one set of number as given in any one of the alternatives. The sets of numbers given in the alternative are represented by two classes of alphabets as shown in the given two matrices. 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, for example, 'N' can be represented by 21, 43 etc. and 'R' can be represented by 66, 57 etc., Similarly, you have to identify the set for the word 'JOIN'.

Matrix-I						Matrix-II					
	0	1	2	3	4		5	6	7	8	9
0	J	H	J	K	A	5	X	Z	R	P	A
1	E	J	O	J	O	6	Z	R	I	I	S
2	J	N	P	O	S	7	I	C	F	K	N
3	T	F	O	H	D	8	N	I	G	N	M
4	Q	O	W	N	F	9	M	V	N	P	N

- (a) 00,43,32,79 (b) 02,67,14,57  
(c) 11,32,66,79 (d) 20,23,86,97
51. If  $3.352 - (9.759 - x) = 7.052$ , then what is the value of  $x$ ?  
(a) -6.181 (b) 13.581  
(c) 33.099 (d) 39.803
52. Square of  $(7 - 4x)$  is:  
(a)  $16x^2 - 28x + 49$   
(b)  $49 - 28x - 16x^2$   
(c)  $49 - 56x - 16x^2$   
(d)  $16x^2 - 56x + 49$
53. On a certain principal if the simple interest for two years is ₹ 3000 and compound interest for two years is ₹ 3225, what is the rate of interest?  
(a) 7.5 percent (b) 30 percent  
(c) 15 percent (d) 22.5 percent
54. At 10% discount the selling price of a toaster is ₹ 18000, what is the selling price if the discount is 37.5%?  
(a) ₹ 7,812.5 (b) ₹ 12,500  
(c) ₹ 8,593.75 (d) ₹ 15,468.75
55. An engineering student has to secure 24% marks to pass. He gets 61 and fails by 29 marks. What is the maximum marks for that exam?  
(a) 375 marks (b) 400 marks  
(c) 425 marks (d) 450 marks
56. The third proportional of two numbers 9 and 15 is :  
(a) 21 (b) 30  
(c) 25 (d) 45
57. What will be the roots of the quadratic equation  $x^2 - 25x + 156 = 0$ ?  
(a) 12, 13 (b) 25, 1  
(c) 9, 16 (d) 31, 6
58. If a cone of radius 3.5 cm and height 9.6 cm is melted and constructed into a cylinder of the same radius, what will be the height of this cylinder? (Take  $\pi = 22/7$ )  
(a) 3.2 cm (b) 6.4 cm  
(c) 1.6 cm (d) 4.8 cm

59. A shopkeeper by selling 9 Rolex watches, earns a profit equal to the selling price of 4 Rolex watches. His profit percentage is :  
(a) 44.4 percent (b) 88.8 percent  
(c) 80 percent (d) 8.8 percent
60. A circle is inscribed in a square. If the length of the diagonal of the square is  $14\sqrt{2}$  cm, what is the area (in sq. cm.) of the circle?  
(a) 308 (b) 462  
(c) 154 (d) 616
61. In  $\Delta PQR$ , S and T are points on side PQ and PR respectively. ST is parallel to QR. If S divides PQ in the ratio 4:1 and length of QR is 15 cm, what is the length of ST?  
(a) 3 cm (b) 5 cm  
(c) 12 cm (d) 10 cm
62. If  $1/(1 + \cos A) + 1/(1 - \cos A) = x$ , then value of  $x$  is :  
(a)  $2 \sec^2 A$  (b)  $2 \operatorname{cosec} A$   
(c)  $2 \operatorname{cosec}^2 A$  (d)  $2 \sec A$
63. Of the 3 numbers whose average is 64, the first number is  $1/3$  times the sum of other 2. The first number is  
(a) 72 (b) 32  
(c) 96 (d) 48
64. Ajit is two times as good a workman as Badrinath and therefore is able to finish a job in 30 days less than Badrinath. Working together, they can do it in :  
(a) 10 days (b) 30 days  
(c) 15 days (d) 20 days
65. The length of the diagonal of a square is 10 cm. What is the area of this square?  
(a) 50 sq cm (b) 100 sq cm  
(c) 200 sq cm (d) 25 sq cm
66. A car travels a certain distance at 32 km/h and comes back at 68 km/h. What is the average speed for total journey?  
(a) 50 km/hr (b) 37.04 km/hr  
(c) 43.52 km/hr (d) 56.48 km/hr
67. What is the compound interest (in ₹) for 1 year on a sum of ₹ 20000 at the rate of 40% per annum compounded half yearly ?  
(a) 8000 (b) 8650  
(c) 8750 (d) 8800

68. A train of length 100 metre crosses another train of length 150 metre running on a parallel track in the opposite direction in 9 seconds. If the speed of train having length 150 metre is 40 km/hr, then what is the speed (in km/hr) of the other train ?

- (a) 30 (b) 48  
(c) 50 (d) 60

69. The present population of a town is 26010. It increases annually at the rate of 2%. What was the population of town two years ago ?

- (a) 25000 (b) 25100  
(c) 25200 (d) 25500

70. While selling an article for ₹ 18450, a person suffered a loss of 50%. At what price he could have sold the article (in ₹) to earn a profit of 50% ?

- (a) 13837 (b) 52000  
(c) 55350 (d) 56775

71. The average of three consecutive even numbers is A. If next five even numbers are added, what is the average of these eight numbers ?

- (a)  $A + 3$  (b)  $A + 4$   
(c)  $A + 5$  (d)  $A + 7$

72. A man has 3 sons, 2 daughters and a wife. They divided a sum of ₹ 19000 among themselves such that each daughter got 1.5 times the amount received by each son and his wife received ₹ 600 less than each son. What is the total amount (in ₹) received by the three sons together ?

- (a) 2800  
(b) 3600  
(c) 5600  
(d) 8400

Directions (73-75) : The table given below represents the marks obtained by 5 students in 4 different subjects. Each student was given marks out of 100 in each of the given subjects.

Student	English	Mathematics	Science	Hindi
1	87	96	90	81
2	74	99	94	89
3	89	99	99	92
4	62	89	96	91
5	95	92	92	86

73. In which subject the total marks of all the students is highest ?

- (a) English (b) Mathematics  
(c) Science (d) Hindi

74. Which student scored the maximum marks in all the 4 subjects taken together ?

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

75. A new subject is added in which all the students have scored 100 marks. If total marks are calculated as sum of the marks of highest 4 subjects, then who will be second in terms of total marks ?

- (a) Student 3  
(b) Student 2  
(c) Student 5  
(d) Student 4

### SECTION-III : GENERAL TEST

1. (c) Washing Soda is essentially Sodium Carbonate, a sodium salt of carbonic acid (soluble in water). The molecular formula of washing soda is  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ . It is used as an agent to soften hard water. It reacts with the calcium and magnesium bonds present in water, enabling the detergent to work.

2. (c) Hydrochloric acid was historically called acidum salis, muriatic acid, and spirits of salt because it was produced from rock salt and green vitriol and later from the chemically similar substances common salt and sulfuric acid. Hydrochloric acid is found naturally in gastric acid.

3. (c) Kanchenjunga National Park is located in Sikkim. The park gets its name from the mountain Kanchenjunga which is 8,586 metres tall, the third-highest peak in the world. The park is known for animals like musk deer, snow leopard and Himalayan Tahr.

4. (a) The Nanda Devi National Park (Biosphere Reserve) is situated around the peak of Nanda Devi, in Uttarakhand. It was established in 1982. Along with the adjoining Valley of Flowers National Park, it was inscribed a World Heritage Site by UNESCO in 1988.

5. (c) Digboi in Tinsukia district of Assam has the distinction of having the oldest oil refinery of India and Asia as well. It was here that the first commercially viable well in India, well No.1, was successfully drilled in September 1889 and first modern refinery in India was built and commissioned in December 1901 by Assam Oil Company Ltd.

6. (b) Sodium bicarbonate ( $\text{NaHCO}_3$ ) is also known as baking soda. It is a chemical leavening agent which is

added to baked goods before cooking to produce carbon dioxide and cause them to 'rise'.

7. (c) In 1969, 14 major private commercial banks were nationalized. This was followed by a second phase of nationalization in 1980, when Government of India acquired the ownership of 6 more banks, thus bringing the total number of nationalized Banks to 20.

8. (d) While the Reserve Bank of India (RBI) has the authority to issue bank notes of denominational values of ₹ 2, ₹ 5, ₹ 10, ₹ 20, ₹ 50, ₹ 100, ₹ 500, ₹ 1,000, ₹ 5,000 and ₹ 10,000, the one rupee note was printed and issued by the central government. The Government of India also has the sole right to mint coins of all denominations.

9. (d) The word "Shatabdi" means centenary in Sanskrit, Hindi and several Indian languages. The first Shatabdi train was started in 1988 to commemorate the centenary of Pandit Jawahar Lal Nehru's Birthday (the First Prime Minister of India) by Madhav Rao Scindia, minister for railways. It operated from New Delhi to Jhansi, later extended to Bhopal.

10. (b) Rabi refers to agricultural crops sown in winter and harvested in the spring. Examples of Rabi Crops: Wheat, Gram, Pea, Mustard, Linseed, Barley. Rice is a Kharif crop, cultivated and harvested during the rainy (monsoon) season in the South Asia.

11. (d) On September 1, 2018, India opens Zokhawthar immigration check-post in Mizoram along Myanmar border. It is the second immigration check-post in Mizoram, after Zorinpui check post which was opened in 2017. It is one of the largest trading centres after the state capital Aizawl. Myanmar also opened the land border crossing at Zokhawthar-Rih.

12. (b) Bombay High, also known as Mumbai High, is an offshore oilfield 162 kilometres off the coast of Mumbai about 75 m of water. The oil operations are run by India's Oil and Natural Gas Corporation (ONGC).

13. (b) Forest area (% of land area) in India was last measured at 23.07% in 2011, according to the World Bank. Forest area is land under natural or planted stands of trees of at least 5 meters in situ, whether productive or not, and excludes tree stands in agricultural production systems.

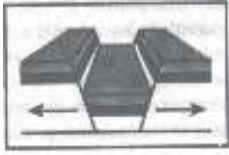
14. (c) The Constitution empowers the President to summon each House at such intervals that there should not be more than 6-month's gap between the two sessions. Hence the Parliament must meet at least twice a year. In India, the parliament conducts three sessions each year.

15. (b) The Forty Second Constitution Amendment Act, 1976 has incorporated ten Fundamental Duties in Article 51(a) of the constitution of India. This was done in accordance with the recommendation of the Sardar Swaran Singh Committee. India adopted Fundamental Duties from the Constitution of erstwhile USSR.

16. (a) On August 30-31, 2018, the 4th Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) Summit was held for 2 days in Kathmandu, Nepal. Nepal is the current chair of the BIMSTEC. The theme of the 4th meeting was: "Towards a Peaceful, Prosperous and Sustainable Bay of Bengal Region". The Nepalese Prime Minister handed over the chairmanship of BIMSTEC to the President of Sri Lanka, Maithripala Sirisena.

17. (d) Varahamihira was an Indian astronomer, mathematician, and astrologer who lived in Ujjain in the 6th century A.D. He is considered to be one of the nine jewels (Navratnas) of the court of legendary ruler Yashodharman Vikramaditya of Malwa.

18. (b) A rift valley is a linear shaped lowland between several highlands or mountain ranges created by the action of a geologic rift or fault. It is formed by the subsidence of a segment of the Earth's crust between dip-slip, or normal, faults.



19. (d) As originally enacted, the Constitution of India provided for a Supreme Court with a Chief Justice and 7 judges. As the work of the Court has increased, the present sanctioned strength has swelled to 31.

20. (c) During the reign of Bindusara, Chandragupta Maurya's son and successor, there was unrest at Taxila in the north-western province of Sindh. He sent Asoka (his son) to quell the uprising. Taxila was a highly volatile place because of the Indo-Greek presence and mismanagement of Governor Susima.

21. (b) Resin in the most specific use of the term is a hydrocarbon secretion of many plants, particularly coniferous trees. It is distinct from other liquid compounds found inside plants or exuded by plants, such as sap, latex, or mucilage.

22. (b) Lactometer is used for measuring the density (creaminess) of milk. It is essentially a hydrometer which is an instrument used to measure the specific gravity (or relative density) of liquids; that is, the ratio of the density of the liquid to the density of water.

23. (d) While ascending a hill Gear Ratio should be "Either equal to or greater than 1". Gear Ratio is the ratio between angular velocity of input gear to the angular velocity of output gear. It prevents the vehicle from stalling.

24. (c) An arithmetic-logic unit (ALU) is the part of a computer processor (CPU) that carries out arithmetic and logic operations on the operands in computer instruction words. It performs all arithmetic computations, such as addition and multiplication, and all comparison operations.

25. (d) Since  $R$  is directly proportional to length of the wire when wire is cut into equal parts, then Resistance of each part =  $R/n$ .

When the wires are connected in parallel, then the equivalent resistance of combination is

$$1/R_2 = n/R + n/R + n/R \dots n \text{ times}$$

$$\text{or, } 1/R_2 = n/R$$

$$\text{or, } R_2 = R/n^2$$

26. (b) As, teacher is related to school. Similarly, doctor is related to hospital.

27. (b) As,

J Y

$$10 \quad 25 \rightarrow (10 + 25) = 35$$

Similarly,

R T

$$18 \quad 20 \rightarrow (18 + 20) = 38$$

Finally, the missing term is 38.

28. (b) As,

A D  $\rightarrow$  N

1 4 14

Similarly,

B D  $\rightarrow$  X

2 4 24

Finally, the missing letter is X.

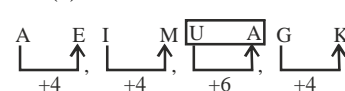
29. (a) As,  $97 \rightarrow (9 - 7) \rightarrow 2$

Similarly,  $84 \rightarrow (8 - 4) \rightarrow 4$

Finally, the missing number is 4.

30. (b) Nephew is odd word from the group niece, aunt and sister.

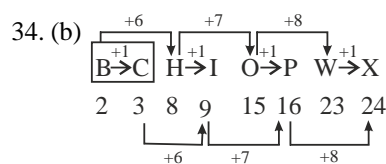
31. (c)



So, UA is odd word.

32. (d) 17, 23 and 29 are prime numbers and 33 is a composite number.

33. (c) 3519 is odd number and 7214, 3816 and 9436 are even numbers.



Hence, the missing term is BC.

$$35. (b) 144 = (12)^2 \rightarrow (8 + 4) = 12$$

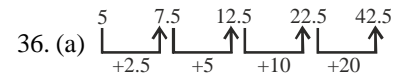
$$256 = (16)^2 \rightarrow (12 + 4) = 16$$

$$400 = (20)^2 \rightarrow (16 + 4) = 20$$

Similarly

$$576 = (24)^2 \rightarrow (20 + 4) = 24$$

Hence, the missing term is 576.



Finally, the missing term is 42.5.

37. (a) According to statements, option (a) is correct.

38. (a) According to question, the sequence is :

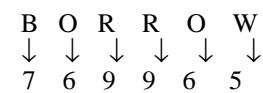
Jyoti > Vineet > Raman > Deepak > Sumit.

39. (b) According to dictionary, the arrangement of words is

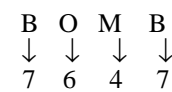
(i) Rainbow, (iv) Rainy,

(ii) Rancour, (iii) Rattle.

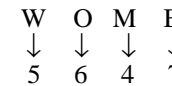
40. (a) If,



and



Then,



Hence, WOMB is written in code language as 5647.

$$41. (d) 5 + 15 + 10 = 30$$

$$\Rightarrow 4 + 17 + 9 = 30$$

$$\Rightarrow 10 + ? + 10 = 30$$

$$\Rightarrow ? + 20 = 30$$

$$\therefore ? = (30 - 20) = 10$$

42. (c) Given expression =  $7B17C$   
88D11A6

$$= 7 - 17 + 88 \div 11 \times 6$$

$$= 7 - 17 + 8 \times 6$$

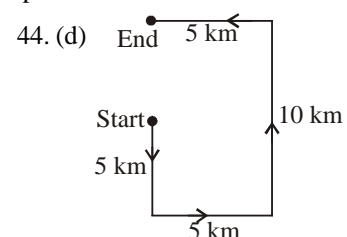
$$= 7 - 17 + 48$$

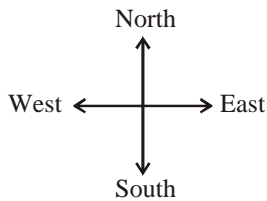
$$= 55 - 17 = 38$$

43. (a) A BBC/ A BBC/ A BB C   

The series ABBCABBCABBC

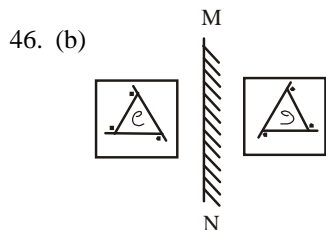
So, the set of letters BAAC completes the series.



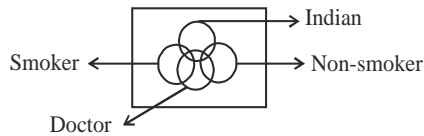


So, Rahul is now in north direction from his initial position.

45. (a) According to question, Johnny is son of Nisha.



47. (d) The Indian can be doctor and doctor can be smoker or not. So the best relationship among these is:



48. (a) A piece of paper is folded and punched, when opened it will appear as given below:



49. (a)

50. (d) J = 00, 02, 11, 13, (20)

O = 12, 14, (23), 32, 41

I = 67, 68, 75, (86)

N = 21, 43, 79, 85, 88, (97), 99

For JOIN, the set of word is, 20, 23, 86, 97.

51. (c)  $3.352 - 9.759 - x - 19.64 = 7.052$

$$\Rightarrow 3.352 + x - 29.399 = 7.052$$

$$\Rightarrow x = 7.052 - 3.352 + 29.399$$

$$= 33.099$$

52. (d) Square of  $(7 - 4k)$

$$= (7 - 4k)^2 = (7)^2 + (-4k)^2 + 2 \times 7 \times (-4k)$$

$$= 49 + 16k^2 - 56k$$

$$= 16k^2 - 56k + 49$$

53. (c) Let principal be  $x$  in time  $t$  at rate of  $R$ .

By tricky formula

Difference in S.I. and C.I.,

$$I_D = \frac{R \times I_s}{200},$$

where  $I_s$  = Simple Interest

$$3225 - 3000 = \frac{R \times 3000}{200}$$

$$\Rightarrow R = \frac{225 \times 200}{3000}$$

$$\Rightarrow R = \frac{75 \times 2}{10}$$

$$\Rightarrow R = \frac{15 \times 2}{2} \Rightarrow R = 15\%$$

54. (b) Discount is always given on marked price, let it be  $x$ .

$$S.P. = \frac{x \times 90}{100}$$

$$90x = 100 \times 18000$$

$$x = \frac{100 \times 18000}{90} = ₹ 20,000$$

S.P. on 37.5% discount

$$= \frac{x \times (100 - 37.5)}{100}$$

$$= \frac{20,000 \times 62.5}{100}$$

$$= 200 \times 62.5 = ₹ 12,500.0$$

55. (a) Let total marks be  $x$ .

According to question,

$$\Rightarrow \frac{x \times 24}{100} = (61 + 29)$$

$$\Rightarrow x = \frac{90 \times 100}{24} = \frac{15 \times 100}{4}$$

$$= 15 \times 25$$

$$\therefore x = 375 \text{ marks}$$

56. (c) Let third proportion be  $x$ .

$$9 : 15 :: 15 : x$$

Then, according to questions,

$$\frac{9}{15} = \frac{15}{x}$$

$$9x = 15 \times 15$$

$$x = \frac{15 \times 15}{9} = 5 \times 5 = 25$$

Hence, third proportion is 25.

$$57. (a) \quad x^2 - 25x + 156 = 0$$

$$\Rightarrow x^2 - 12x - 13x + 156 = 0$$

$$\Rightarrow x(x - 12) - 13(x - 12) = 0$$

$$\Rightarrow (x - 12)(x - 13) = 0$$

$$\Rightarrow x - 12 = 0 \text{ or } x - 13 = 0$$

$$x = 12, \text{ or } x = 13$$

Hence, the roots are 12, 13.

58. (a) Volume of cylinder = Volume of cone

$$\pi R^2 H = \frac{1}{3} \pi r^2 h$$

$$\Rightarrow \pi \times 3.5 \times 3.5 \times H$$

$$= \frac{1}{3} \times \pi \times 3.5 \times 3.5 \times 9.6$$

$$H = \frac{1}{3} \times 9.6 = 3.2 \text{ cm}$$

Hence, the height of cylinder is 3.2 cm.

59. (c) Let S.P. of one Rolex watch be ₹  $x$

S.P. of 9 watches = ₹  $9x$ .

$$(SP - CP) = \text{Profit}$$

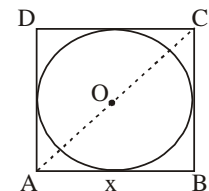
$$(9x - CP) = 4x$$

$$(9x - 4x) = CP$$

$$C.P. = 5x$$

$$\text{Profit percent} = \frac{4x \times 100}{5x} = 80\%$$

60. (c) Let side of a square be  $x$ .



$$AB^2 + BC^2 = AC^2$$

$$x^2 + x^2 = (14\sqrt{2})^2$$

$$2x^2 = 196 \times 2$$

$$x^2 = 196$$

$$x = 14 \text{ cm}$$

Because, the circle is touching both

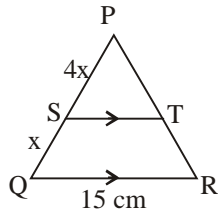
sides of a square so radius =  $\frac{14}{2} = 7 \text{ cm}$

$$\text{Area of circle} = \pi r^2$$

$$= \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$$



61. (c) Let sides be  $4x$  and  $x$



$$\frac{PQ}{PS} = \frac{QR}{ST} \Rightarrow \frac{5x}{4x} = \frac{15}{ST}$$

$$ST = \frac{15 \times 4}{5} = 12 \text{ cm}$$

62. (c)  $\frac{1}{1 + \cos A} + \frac{1}{(1 - \cos A)} = x$

$$\Rightarrow \frac{1 - \cos A + 1 + \cos A}{(1 + \cos A)(1 - \cos A)} = x$$

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

$$\Rightarrow x = \frac{2}{\sin^2 A} = 2 \operatorname{cosec}^2 A$$

63. (d) Let three numbers be  $x_1$ ,  $x_2$  and  $x_3$

Total sum of three numbers

$$x_1 + x_2 + x_3 = 64 \times 3 = 192 \quad \dots(i)$$

$$\Rightarrow x_1 = \frac{1}{3}(x_2 + x_3)$$

$$\Rightarrow 3x_1 = x_2 + x_3 \quad \dots(ii)$$

On putting,  $x_2 + x_3 = 3x_1$  in (i)

$$\Rightarrow x_1 + 3x_1 = 192$$

$$\Rightarrow 4x_1 = 192$$

$$\therefore x_1 = \frac{192}{4} = 48$$

64. (d) Ajit is able to finish a job in 30 days.

He is able to work in 1 day

$$= \frac{1}{30} \text{ part}$$

Badrinath will complete it in 60 days.

Badrinath will complete it in

$$1 \text{ day} = \frac{1}{60} \text{ part}$$

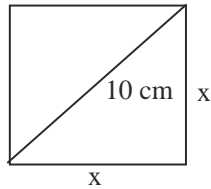
Both will complete in 1 day

$$= \frac{1}{30} + \frac{1}{60} \text{ part}$$

$$= \frac{2+1}{60} = \frac{3}{60} = \frac{1}{20} \text{ part}$$

Hence, time taken by both together = 20 days

65. (a) Let side of a square be  $x$ .



Length of a diagonal = 10 cm

According to question,

$$(10)^2 = x^2 + x^2$$

$$2x^2 = 100$$

$$\Rightarrow x^2 = \frac{100}{2} = 50$$

Area of square =  $x^2 = 50 \text{ cm}^2$

Hence, area of square is  $50 \text{ cm}^2$ .

66. (c) Average speed of a car

$$= \left( \frac{2ab}{a+b} \right) \text{ km/hr}$$

Here,  $a = 32 \text{ km/hr}$ ,

$b = 68 \text{ km/hr}$

$$= \frac{2 \times 32 \times 68}{32 + 68}$$

$$= \frac{2 \times 32 \times 68}{100}$$

$$= 43.52 \text{ km/h}$$

67. (d) Rate of interest = 20% per half yearly

Equivalent rate for 1 year

$$= \left( 20 + 20 + \frac{20 \times 20}{100} \right) \% = 44\%$$

$$\therefore \text{C. I.} = \frac{20000 \times 44}{100} = ₹ 8800$$

68. (d) Speed of first train 150 metre long = 40 kmph

Speed of second train =  $x$  kmph

Total length of both trains

$$= (100 + 150) \text{ metre}$$

$$= 250 \text{ metre} = \frac{1}{4} \text{ km}$$

According to the question,

$$\frac{\text{Total length of trains}}{\text{Relative speed}} = \text{Time}$$

$$\Rightarrow \frac{\frac{1}{4}}{x+40} = \frac{9}{3600} = \frac{1}{400}$$

$$\Rightarrow 4(x+40) = 400$$

$$\Rightarrow x+40 = 100$$

$$\Rightarrow x = 100 - 40 = 60 \text{ kmph.}$$

69. (a) The population of city 2 years ago

$$= \frac{P}{\left(1 + \frac{R}{100}\right)^2}$$

$$= \frac{26010}{\left(1 + \frac{2}{100}\right)^2} = \frac{26010}{\left(1 + \frac{1}{50}\right)^2}$$

$$= \frac{26010}{\left(\frac{51}{50}\right)^2} = \frac{26010 \times 50 \times 50}{51 \times 51}$$

$$= 25000$$

70. (c) C.P. of article

$$= ₹ \left( \frac{100}{50} \times 18450 \right) = ₹ 36900$$

To gain 50%, S.P. of article

$$= ₹ \frac{(36900 \times 150)}{100} = ₹ 55350$$

71. (c) New average will increase by 5.

i.e., New average =  $A + 5$

Illustration:

$$\frac{2+4+6}{3} = \frac{12}{3} = 4;$$

$$\frac{2+4+6+8}{4} = \frac{20}{4} = 5;$$

$$\frac{2+4+6+8+10}{5} = \frac{30}{5} = 6.$$

72. (d) Let each son's share be = ₹  $x$

Each daughter's share = ₹  $1.5x$

Wife's share = ₹  $(x - 600)$



According to the question,

$$3x + 2 \times 1.5x + x - 600 = 19000$$

$$\Rightarrow 3x + 3x + x = 19000 + 600 = 19600$$

$$\Rightarrow 7x = 19600$$

$$\Rightarrow x = \frac{19600}{7} = ₹ 2800$$

∴ Total share of three sons

$$= ₹ (3 \times 2800) = ₹ 8400$$

73. (b) Marks obtained by all students  
in Math

$$= 96 + 99 + 99 + 89 + 92 = 475$$

$$\text{In Science} = 90 + 94 + 99 + 96 \\ + 92 = 471$$

$$74. (c) \text{ Total marks of student 3} = 89 + \\ 99 + 99 + 92 = 379$$

75. (b) Sum of four maximum marks

$$\text{Student-3} = 100 + 99 + 99 + 92 = 390$$

$$\text{Student-2} = 100 + 99 + 94 + 89 = 382$$

$$\text{Student-5} = 100 + 95 + 92 + 92 = 379$$

$$\text{Student-4} = 100 + 96 + 91 + 89 = 376$$

