

# TCS Test

## INSTRUCTIONS

1. In all there are 35 questions in the test. Direction for answering the questions is given before each group of questions. There is only one correct answer to each question.
2. Each question carries 1 mark. 0.25 marks will be deducted for every wrong answer.
3. The duration of the test is 1 hour.
4. Follow the instructions of the invigilator. Candidates found violating the instructions will be disqualified.

*Candidates giving assistance or seeking/receiving help from any source in answering questions or copying in any manner in the test will forfeit their chances of being considered for admission. Such candidates will forfeit the right to the scorecard and the Institutes concerned will not issue scorecards to them. The Institutes reserve the right to exclude any question or questions from this test Booklet for final evaluation.*

# Quantitative Aptitude

1. The number of positive integer values of the pair  $(x, y)$ , satisfying  $4x - 17y = 1$  and  $x \leq 1000$  is \_\_\_\_.

- a) 59                                      b) 57                                      c) 55                                      d) 58

2. Total expenses of a boarding house are partly fixed and partly varying linearly with the number of boarders. The average expense per boarder is Rs.700 when there are 25 boarders and Rs. 600 when there are 50 boarders. What is the average expense per boarder when there are 100 boarders?

- a) 550                                      b) 560                                      c) 540                                      d) 530

**Direction for Questions 3 – 5:** Answer the questions based on the following information. These questions are based on the situation given below:

There are fifty integers,  $a_1, a_2, \dots, a_{50}$ , such that not all of them are necessarily different. Let the greatest integer of these fifty integers be referred to as  $G$ , and the smallest integer be referred to as  $L$ . The integers  $a_1$  through  $a_{24}$  form sequence  $S_1$ , and the rest form sequence  $S_2$ . Each member of  $S_1$  is less than or equal to each member of  $S_2$ .

3. All values in  $S_1$  are changed in sign, while those in  $S_2$  remain unchanged. Which of the following statements is true?

- a) Every member of  $S_1$  is greater than or equal to every member of  $S_2$ .  
b)  $G$  is in  $S_1$ .  
c) If all numbers originally in  $S_1$  and  $S_2$  had the same sign, then after the change of sign, the largest number of  $S_1$  and  $S_2$  is in  $S_1$ .  
d) None of the above

4. Elements of  $S_1$  are in the ascending order, and those of  $S_2$  are in the descending order.  $a_{24}$  and  $a_{25}$  are interchanged. Based on this, which of the following statements is true?

- a)  $S_1$  continues to be in the ascending order.  
b)  $S_2$  continues to be in the descending order.  
c)  $S_1$  continues to be in the ascending order and  $S_2$  in the descending order.  
d) None of the above

5. Every element of  $S_1$  is made greater than or equal to every element of  $S_2$  by adding to each element of  $S_1$  an integer  $x$ . Then  $x$  cannot be less than \_\_\_\_.

- a)  $2^{10}$                                       b) the smallest value of  $S_2$   
c) the largest value of  $S_2$                                       d)  $(G - L)$

6. Let  $a, b, c$  be distinct digits. Consider a two-digit number 'ab' and a three-digit number 'ccb', both defined under the usual decimal number system. Now, if  $ab^2 = ccb > 300$  then the value of  $b$  is \_\_\_\_.

- a) 1                                      b) 0                                      c) 5                                      d) 6

7. Ten points are marked on a straight line and eleven points are marked on another straight line. How many triangles can be constructed using vertices from among these points?

- a) 495                                      b) 550                                      c) 1045                                      d) 2475

8. The speed of a railway engine is 42 km per hour when no compartment is attached, and the reduction in speed is directly proportional to the square root of the number of compartments attached. If the speed of the train carried by this engine is 24 km per hour when 9 compartments are attached, then the maximum number of compartments that are carried by the engine is \_\_\_\_\_.

- a) 49                                      b) 48                                      c) 46                                      d) 47

9. Forty percent of the employees of a certain company are men, and 75 percent of the men earn more than Rs. 25,000 per year. If 45 percent of the company's employees earn more than Rs. 25,000 per year, what fraction of the women employed by the company earn less than or equal to Rs. 25,000 per year?

- a)  $\frac{2}{11}$                                       b)  $\frac{1}{4}$                                       c)  $\frac{1}{3}$                                       d)  $\frac{3}{4}$

10. If  $|r - 6| = 11$  and  $|2q - 12| = 8$ , and what is the minimum possible value of  $\frac{q}{r}$  ?

- a)  $-\frac{2}{5}$                                       b)  $\frac{2}{17}$                                       c)  $\frac{10}{17}$                                       d) None of these

11. If  $n = 1 + x$ , where  $x$  is the product of four consecutive positive integers, then which of the following is/are true?

- A.  $n$  is odd                                      B.  $n$  is prime                                      C.  $n$  is a perfect square

- a) A and C only                                      b) A and B only                                      c) A only                                      d) None of these

12. In a survey of political preferences, 78% of those asked were in favour of at least one of the proposals: I, II and III. 50% of those asked favoured proposal I, 30% favoured proposal II and 20% favoured proposal III. If 5% of those asked favoured all three of the proposals, what percentage of those asked favoured more than one of the 3 proposals?

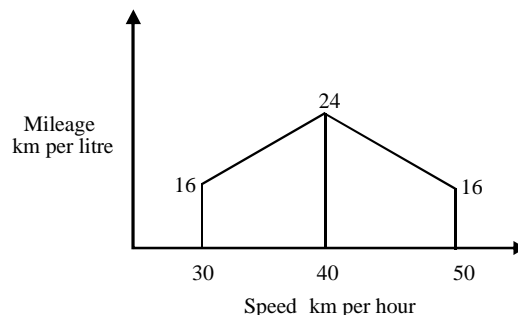
- a) 10                                      b) 12                                      c) 17                                      d) 22

13. For two positive integers  $a$  and  $b$  define the function  $h(a, b)$  as the greatest common factor (G.C.F) of  $a, b$ . Let  $A$  be a set of  $n$  positive integers.  $G(A)$ , the G.C.F of the elements of set  $A$  is computed by repeatedly using the function  $h$ . The minimum number of times  $h$  is required to be used to compute  $G$  is \_\_\_\_\_.

- a)  $\frac{1}{2}n$                                       b)  $(n - 1)$                                       c)  $n$                                       d) None of these

**Direction for Questions 14 and 15:** Answer the questions based on the information given below.

Rajiv reaches city B from city A in 4 hours, driving at the speed of 35 km per hour for the first two hours and at 45 km per hour for the next two hours. Aditi follows the same route, but drives at three different speeds: 30, 40 and 50 km per hour, covering an equal distance in each speed segment. The two cars are similar with petrol consumption characteristics (km per litre) as shown in the figure below.



**14.** The amount of petrol consumed by Aditi for the journey is \_\_\_\_\_.

- a) 8.3 litres                      b) 8.6 litres                      c) 8.9 litres                      d) 9.2 litres

**15.** Zoheb would like to drive Aditi's car over the same route from A to B and minimise the petrol consumption for the trip. The amount of petrol required by him is \_\_\_\_\_.

- a) 6.67 litres                      b) 7 litres                      c) 6.33 litres                      d) 6.0 litres

**16.** A train leaves station X for Y at 8.00 a.m. at a speed of 120 kmph. Another train leaves station Y for X at 10.00 a.m. at a speed of 130 kmph. At what time will the two trains meet if the distance between X and Y is 1,740 km?

- a) 4.00 p.m.                      b) 5.00 p.m.                      c) 4.48 p.m.                      d) 3.48 p.m.

**17.** A train crosses a 250 m long platform. The speed of the train is 36 kmph. The total time taken to cross the platform is 35 seconds. Find the length of the train.

- a) 120 m                      b) 100 m                      c) 120 km                      d) 100 km

**18.** What is the number  $(1000\ 0011\ 0111)_{BCD}$  in decimal?

- a) 837                      b) 2103                      c) 4151                      d) 1992

**19.** There is a leak in the bottom of a tank. This leak can empty the tank in 8 hrs. When the tank is full a tap is opened into the tank, which fills water at the rate of 6 L/hr, and the tank is now emptied in 12 hrs. What is the capacity of the tank?

- a) 28.8 L                      b) 36 L                      c) 144 L                      d) 72 L

**20.**

$$\frac{\text{N.I.N.E.T.E.E.N}}{\text{N.I.N.E.T.Y.F.I.V.E}} = \frac{\text{O.N.E}}{\text{F.I.V.E}}$$

- I. Here '.' (dot) represents multiplication.  
II. Every letter has unique value from 0-10.  
III.  $O < Y$ , and value of 'O' is not equal to 1.

Which of the following can be the value of E?

- a) 2                      b) 3                      c) 8                      d) 9

**21.** A train 110 m long is travelling at 58 kmph. What is the time in which it will pass a man walking in the same direction at 4 kmph?

- a) 6 s                      b) 7.5 s                      c) 7.33 s                      d) 7.33 min

**22.** A thief breaks away from a prison at 3:00 a.m. The police official on duty realizes it at 6:00 a.m and starts chasing the thief. The speed of the thief is 45 kmph, while that of the police is 60 kmph. At what time will the police catch the thief?

- a) 6 : 00 p.m.                      b) 3 : 00 p.m.                      c) 5 : 00 p.m.                      d) 5 : 30 p.m.

**23.** A young girl counted in the following way on the fingers of her left hand. She started by calling the thumb 1, the index finger 2, middle finger 3, ring finger 4, little finger 5, then reversed direction calling ring finger 6, the middle finger 7, index finger 8, thumb 9 and then back to the index finger for 10 and so on. She counted up to 1994. She ended on her:

- a) Middle Finger      b) Index Finger      c) Ring Finger      d) Thumb

**24.** Rakesh goes to his office in the city, every day from his suburban house. His driver Bahadur drops him at the office in the morning and picks him up in the evening. Every evening Rakesh reaches the office at 6 O' Clock. Bahadur also reaches at the same time. One day his office gets over at 5 O' Clock and Rakesh not wanting to wait for the car he started walking home. Bahadur starts at normal time, picks him up on the way and takes him back house, half an hour early. How much time did Rakesh walk?

- a) 30 min      b) 45 min      c) 50 min      d) 60 min

**25.** Let  $N = 1421 \times 1423 \times 1425$ . What is the remainder when N is divided by 12?

- a) 7      b) 9      c) 3      d) 1

**26.** A boy buys eggs at 10 for Rs.1.80 and sells them at 11 for Rs.2. What is his gain or loss percent?

- a) 1% Loss      b) 10% Loss      c) 10% gain      d) No Gain / No Loss

**27.** Abhimanyu has to cover a distance of 80 km in 10 hours. If he covers half of the journey in  $\frac{3}{5}$  of the time, what should be his speed to cover the remaining distance in the time left?

- a) 8 kmph      b) 6.4 kmph      c) 10 kmph      d) 20 kmph

**28.** Ajay covers first two hours of his journey at 30 kmph, the next five hours of his journey at 40 kmph and the last three hours of his journey at 50 kmph. What is his average speed for the entire journey?

- a) 40 kmph      b) 35 kmph      c) 45 kmph      d) 41 kmph

**Direction for questions 29 and 30:** In each of the following questions a set of five numbers are given. You need to use four of these with arithmetic operations  $+$ ,  $-$ ,  $\times$ ,  $\div$ ,  $()$  to attain a RESULTANT answer. You can use the numbers only once, but can use the arithmetic operators as many times as possible. Your answer is the number that you are not using out of the set.

For Example: If the set of numbers is  $\{25, 22, 16, 5, 1\}$  and the RESULTANT desired is 41, then the answer is 16, as  $41 = 25 + 22 - 5 - 1$ .

**29.** RESULTANT = 114, Set =  $\{4, 5, 10, 12, 19\}$

- a) 4      b) 5      c) 19      d) 10

**30.** RESULTANT = 19, Set =  $\{8, 11, 5, 7, 2\}$

- a) 11      b) 7      c) 8      d) 2

**31.** A tap fills a tank in 6 min. at a rate of 3 cu. ft. per min. If the outside length of the tank is 4 ft and the outside width is 1 ft. What is the depth of the tank, if the thickness of the walls is 0.2 ft.?

- a) 80 inches      b) 90 inches      c) 100 inches      d) 110 inches

**32.** A, B and C are three non collinear points. The distance between points A and C is 60 miles, while the distance between B and C is 50 miles and the distance between A and B is 50 miles. What is the shortest distance between the point B and the line joining A and C?

- a) 35 miles                      b) 40 miles                      c) 45 miles                      d) 50 miles

**33.** A is 8 km East of B, B is 10 km North of C, C is 7 km East of D, E is 2 km North of D. What is the shortest distance between A to E?

- a) 17 km                      b) 19 km                      c) 21 km                      d) 23 km

**34.** Cost Price of an article is \$50. A shopkeeper increases the price of the article to 108% of its value, and then sells it at a discount of 10%. What is the selling price of the article?

- a) \$47.4                      b) \$48.6                      c) \$93.6                      d) \$97.2

**35.** Pipe A can alone fill a tank completely in 6 hours, while Pipe B can alone do it in 4 hours. The two Pipes are opened in alternate hours starting with Pipe A in first hour. In how many hours will the tank get full?

- a) 2.4 hours                      b) 4.66 hours                      c) 5 hours                      d) 6 hours