

SECTION I

QUANTITATIVE APTITUDE

1. Rohan gave his younger sister a puzzle to solve. He says he has thought of a number which gives a perfect square if she added 100 to it and would give another perfect square if she added 152 to it. He asked her to find the number. Help her find the number.
(a) 44 (b) 54
(c) 64 (d) 45
2. Ravi wants to write all the two-digit natural numbers which have their unit's digit greater than their ten's digit. If all these numbers are written one after the other in a series, how many digits are there in the resulting number?
(a) 80 (b) 72
(c) 36 (d) None of these
3. Ram Singh has a rectangular plot of land of dimensions $30\text{ m} \times 40\text{ m}$. He wants to construct a unique swimming pool which is in the shape of an equilateral triangle. Find the area of the largest swimming pool which he can have?
(a) $300\sqrt{3}\text{ sq cm}$
(b) $225\sqrt{3}\text{ sq cm}$
(c) 300 sq cm (d) None of these
4. In Jankaipuram, 55% of the families own air conditioners, 85% own coolers and 75% own generator sets. What is the minimum percentage of families that own all the three objects?
(a) 10 (b) 15
(c) 20 (d) 30

Direction for Questions 5 and 6

Answer the questions based on the following information.

There is a 10 km race held in the Annual College Sports Fest of IET Lucknow. In this race Aditya starts first and is followed later by Yashpal. The speed of Yashpal is 1 m/s more than that of Aditya's. When Yashpal catches up with Aditya, Aditya increases his speed by 2 m/s, while that of Yashpal remains unchanged. As a result, Yashpal finishes 7 min 8 s after Aditya. If the distance had been 500 m more, then Yashpal would have finished 7 min 33 s after Aditya.

5. The time gap between the start of Aditya and Yashpal is
(a) 2.4 min (b) 3.5 min
(c) 2 min (d) 1 min

6. The speed of Yashpal is
(a) 2.4 m/s (b) 4.5 m/s
(c) 3.5 m/s (d) 4 m/s
7. The value of the expression $(x^2 - x + 1)/(x - 1)$ cannot lie between?
(a) (1,3) (b) (-1, -3)
(c) (-1, 3) (d) (-1, 2)
8. A book contains 20 chapters. Each chapter has a different number of pages (each under 21). The first chapter starts on page 1 and each chapter starts on a new page. What is the largest possible number of chapters that can begin on odd page numbers?
(a) 19 (b) 15
(c) 10 (d) 11
9. How many even three-digit integers have the property that their digits, read left to right, are not in a strictly increasing order?
(a) 420 (b) 416
(c) 412 (d) 422
10. The number of rational points $x = p/5$ satisfying $\log(2x - 3/4)/\log x > 2$, where p is an integer and $\gcd(p, 5) = 1$ is/are
(a) 2 (b) 3
(c) 5 (d) 1
11. Two schools play against each other in a grass court tennis tournament. Each school is represented by 8 students. Every game is a doubles game, and every possible pair from the first school must play one game against every possible pair from the second school. How many games will each student play?
(a) 196 (b) 180
(c) 192 (d) 164
12. An unlimited number of coupons bearing the digits 1, 2 and 3 are available. What is the possible number of ways of choosing 4 of these coupons so that they cannot be used to make the number 123?
(a) 15 (b) 18
(c) 21 (d) 24
13. A teacher throws a question in front of his class and says that he will give a chocolate as a prize to the student who solves it. He says, "I have a two-digit number in my mind. If I square the number, then the last digit of both the numbers have the same last digit. None of the digits in the original number is zero. When the digits of the original number is written in the reverse order, the square of the new number obtained has a last digit 6 and is less than 3000. Now find the number of distinct

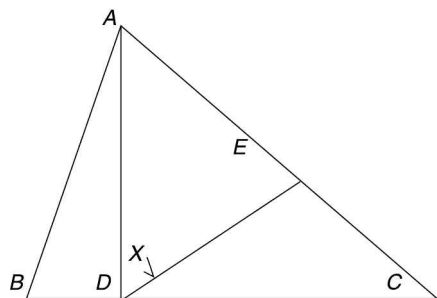
6.4 Model Test Paper

possibilities for the number.” Rajiv found the exact answer. What was his answer?

- (a) 3 (b) 6
(c) 8 (d) 9

14. In figure $AB = AC$, angle $BAD = 30^\circ$, and $AE = AD$. Then x equals:

- (a) 15 (b) 20
(c) 30 (d) none of these



15. The perimeter of a triangle is 105 cm. The ratio of its altitudes is 3 : 5 : 6. Find the sides of the triangle.

- (a) 52, 26, 27 (b) 50, 27, 28
(c) 30, 60, 25 (d) 50, 30, 25

16. There are two spheres and one cube. The cube is inside the bigger sphere and the smaller sphere is inside the cube. Find the ratio of surface areas of the bigger sphere to the smaller sphere.

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

17. Aaj Tak decided to get into the print business and so it started publishing magazines. It printed 7,000 magazines at a cost of Rs. 44,000. It distributed 1000 magazines free to as a part of advertisement and promotion process. It allowed a discount of 20% on the published price and gave one extra copy when a retailer bought 19 copies at a time. It sold all the copies by this scheme. If the published price is Rs. 11.25, find the gain or loss percentage for Aaj tak.

- (a) 16.5% gain (b) 13.5% gain
(c) 30% loss (d) None of these

18. What is the maximum value of the function $y = \min(12 - x, 8 + x)$?

- (a) 12 (b) 10
(c) 11 (d) 8

19. How many integral values for the set (x, y) would exist for the expression $|x - 4| + |y - 2| = 5$?

- (a) 16 (b) 14
(c) 12 (d) 18

20. How many real solutions exist for the equation $3^x - 2x - 1 = 0$?

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