LAKSHYA ACADEMY

RASHTRIYA INDIAN MILITARY COLLEGE, DEHRADUN
SCHOLARSHIP & ADMISSION TEST
SUBJECT : MATHEMATICS

TIME : 1 Hr 30 Mins   **MM : 200**

NAME : _____   **DATE : ___/___/_____**

Instructions:

1. Attempt all 20 questions. Write your answers separately on the answer sheet provided at the exam centre.
2. Part 'A' contains 10 questions and each question in this part carries 'Eight marks'.
3. Part 'B' contains 10 questions and each question in this part carries 'Twelve marks'.
4. Use of calculator is prohibited. Complete written justification is required for each question. Marks will be awarded for correct steps to reach the solution. Answers without justification will not have any credit.
5. Take the value of π as $\frac{22}{7}$.
6. Use blue/black ball pen to answer the questions.
7. The question paper can be retained by the candidates post examination.

PART A ($10 \times 8 = 80$ MARKS)

1. Between 1 and 2009, how many numbers are multiples of 5 or 7?

2. A triangle has side lengths 10, 10, and 12. A rectangle has width 4 and area equal to the area of the triangle. What is the perimeter of this rectangle?

3. Lucas multiplies his month of birth by 31. He then multiplies his day of birth by 12. The sum of the two products is 213. When is his birthday?

4. A man walked 15 kms from A to B at a uniform speed. If he were to increase his speed by 4 km/h he would have saved 60 min on the journey. Find his speed in km/h.

5. In a hostel mess there is enough food provisions for 1200 boarders for a month. After 15 days half of them leave due to vacations. How long will the food provisions now last?
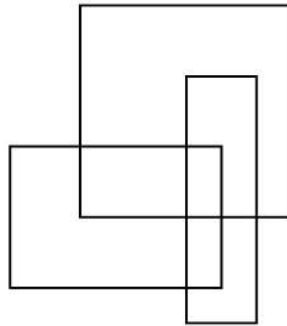
"LIFE IS TOO SHORT TO WAIT"
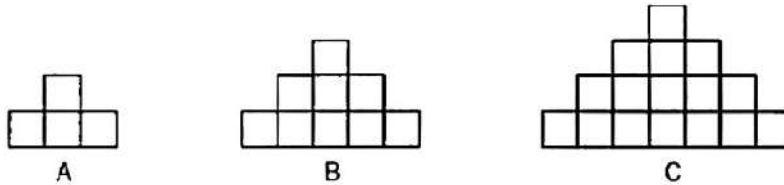
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6. A teacher has a bag of sweets. If she gives every student 4 sweets, she is left with 48 sweets. If she gives every student 6 sweets, she needs another 8 sweets. How many students does she give the sweets to?

7. How many rectangles are in the figure below?

8. Figure A, formed by 4 squares, has a perimeter of 30 cm. What is the perimeter of the figure formed by 64 squares?

9. Kelly and Jessy have 100 beads altogether. $\frac{1}{3}$ of the number of beads Jessy has is 16 more than $\frac{1}{10}$ of the number of beads Kelly has. How many beads does each girl have?

10. A rectangular floor, 9 feet by 11 feet, is covered completely by tiles. Each tile is either a 2-foot by 3-foot rectangle or a square 1-foot on a side. No tiles overlap. What is the least total number of tiles that could have been used to cover the floor?

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PART A $(10 \times 12 = 120$ MARKS$)$

11. Find the value of the following.

$$20082009 \times 20092008 - 20082008 \times 20092009$$

12. The diagram shows a rectangle being divided into 3 smaller rectangles and a square. If the perimeter of the unshaded rectangle is 16 cm and the area of the square is 9 cm², find the total area of the shaded rectangles.

13. Two groups consisting of 234 boys and 286 girls are to participate in a drill. In how many minimum rows can all the students be divided so that any given row either consists of only boys or only girls?

14. Find the smallest positive integer greater than 123456789 that is
(a) divisible by 3
(b) divisible by 4
(c) divisible by 8
(d) divisible by 9

15. Find the smallest positive integer that has exactly 9 positive divisors.

16. Compute:

$$(1 + 2 + 3 + \dots + 99 + 100) - 2(1 + 3 + 5 + \dots + 99).$$

17. The average of the numbers $1, 2, 3, \dots, 98, 99,$ **and** x **is** $100x.$ **What is** x?

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18. The digits 1, 2, 3, 4, 5, 6, 7, 8, and 9 are to be written in the squares so that every row and every column with three numbers has a total of 13. Two numbers have already been entered. What is the number in the square marked?
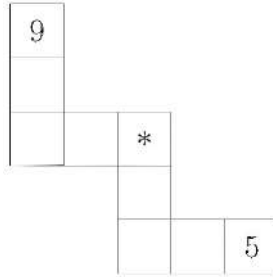
19.   (a) Choose any three letters from a, b, c, and d. In how many ways can we arrange the three letters?

(b) A teacher wants to choose a captain and vice-captain among 12 volleyball players. In how many ways can he do so?

20. A total of 9 regions are formed by 5 circles. Two such regions have the numbers, 12 and 15.
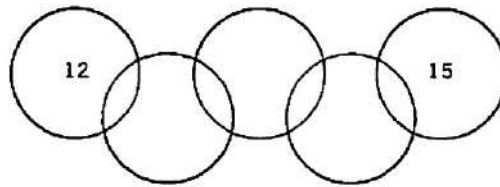
Use the numbers 3, 4, 5, 6, 8, 9 and 11 once only for the rest of the regions so that the sum of numbers in each circle is 20.

ALL THE BEST

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