

CRPF PUBLIC SCHOOL, ROHINI

THIRD InTRa ScHool MaTHEMaTicS ol yMplaD 2012

CLASS IX

Max. Marks: 50

Max. Time: 1 hour 30 minutes

General Instructions:

1. Q1-15 (Section A) each MCQ carries 2 mark. Each question has five choices (A, B, C, D or E). Select the correct answer to each question and darken the corresponding circle in the Answer Sheet provided to you. **THERE IS NO NEGATIVE MARKING.** Marking of more than one circle for an answer shall be awarded zero mark.
2. Q16-20 (Section B) each question carries 4 mark. You are to give the complete solution. Marking will be done stepwise.

SECTION – A

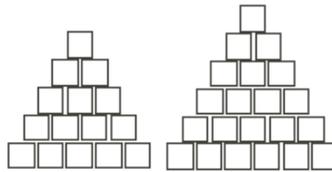
Q1. The value of  $\frac{1996(1997^2 - 9)1998}{2000(1997^2 - 1)}$  is:

- (A) 1994      (B) 1995      (C) 1996      (D) 1997      (E) 1998

Q2. How many different pairs of integers  $(x; y)$  are solutions of the equation  $x^2 - 3y^2 = 1997$  ?

- (A) 1      (B) 2      (C) 3      (D) infinitely many      (E) none

Q3. John knocks over the two stacks of blocks shown in the diagram. He then uses the blocks to build a similar stack whose top layer has one block and each layer below has one more block than the layer above it. If he builds the largest possible stack, how many blocks will be left over?



- (A) 0      (B) 1      (C) 2      (D) 3      (E) 4

Q4. Six friends ate at a restaurant and agreed to share the bill equally. Because Luxmi forgot her money, each of her five friends paid an extra Rs.3 to cover her portion of the total bill. What was the total bill?

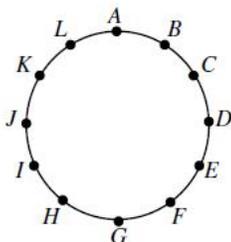
- (A) Rs.90      (B) Rs.84      (C) Rs.75      (D) Rs.108      (E) Rs.60

Q5. In the expression  $\frac{a}{b} + \frac{c}{d} + \frac{e}{f}$  each letter is replaced by a different digit from 1, 2, 3, 4, 5 and 6.

What is the largest possible value of this expression?

- (A)  $8\frac{2}{3}$       (B)  $9\frac{5}{6}$       (C)  $9\frac{1}{3}$       (D)  $9\frac{2}{3}$       (E)  $10\frac{1}{3}$

**Q6.** Twelve balloons are arranged in a circle as shown. Counting clockwise, every third balloon is the first one popped. This continues around the circle until two unpopped balloons remain. The last two remaining balloons are:



- (A) B, H    (B) B, G    (C) A, E    (D) E, J    (E) F, K

**Q7.** If  $1 \times 2 \times 3 \times \dots \times 199 \times 200$  is calculated, then the number of zeros at the end of the product is:

- (A) 42    (B) 43    (C) 46    (D) 49    (E) 52

**Q8.** If the length to breadth ratio is the same whether a book is opened or closed find the ratio of length to breadth:

- (A)  $\sqrt{2}:1$     (B)  $\sqrt{2}:2$     (C) 2:1    (D) 4:1    (E) 8:1

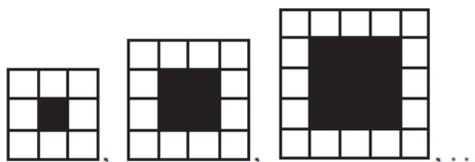
**Q9.** If  $M$  is a square number, then the next immediate square number is:

- (A)  $M+5$     (B)  $M+2\sqrt{M}+1$     (C)  $M^2+2M$     (D)  $M+9$     (E) none of these

**Q10.** Three containers have their volumes in the ratio 3:4:5. They are full of mixtures of milk and water. The mixtures contain milk and water in the ratio of 4:1, 3:1 and 5:2 respectively. The ratio of milk and water in the fourth container contains all the above three mixtures is

- (A) 4:1    (B) 151:48    (C) 157:53    (D) 5:2    (E) 5:4

**Q11.** How many unshaded squares are in the tenth figure of the pattern?



- (A) 38    (B) 40    (C) 42    (D) 44    (E) 46

**Q12.** A student has to secure 40% marks to pass. He got 40 marks and failed by 40 marks. The maximum number of marks is

- (A) 160    (B) 180    (C) 200    (D) 320    (E) 360

**Q13.** The true statement for the data, -1, -1, 0, 2, 3, 5, 5, 6, 8, 10 and 11, is:

- (A) Mean=Median=Mode    (B) Mode=Median=5    (C) Mean=Median=5  
 (D) Mean=Mode=5    (E) Only Mode=5

**Q14.** Find the missing number in the following series

1, 8, 7, 14, 13, 20, \_\_\_\_\_, 26

- (A) 21      (B) 18      (C) 22      (D) 19      (E) 25

**Q15.** 'Buy three, get one free.' What is the percentage of discount being offered here?

- (A) 20%      (B) 28.56%      (C) 33%      (D) 22%      (E) 25%

**SECTION – B**

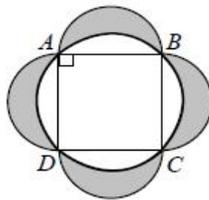
**Q16.** Find the value of  $\sqrt{5+2\sqrt{6}}$  up to 2 places of decimals if  $\sqrt{2} = 1.41$ ,  $\sqrt{3} = 1.73$ .

**Q17.** The polynomial  $p(x) = x^4 - 2x^3 + 3x^2 - ax + b$  when divided by  $(x+1)$  and  $(x-1)$  leaves the remainders 19 and 5 respectively. Find the values of a and b. Hence, determine the remainder when  $p(x)$  is divided by  $(x-2)$ .

**Q18.** A rhombus shaped field has green grass for 18 cows to graze. If each side of the rhombus is 30 m and its longer diagonal is 48 m, how much area of grass field will each cow get?

**Q19.** Two buses start travelling at the same time, bus 1 from city A to city B, and bus 2 from city B to city A using the same road. Both buses travel with their constant speeds. For the first time they meet 7 km from A. After both buses reach their destinations (cities B and A respectively, possibly at different times), they immediately start travelling back along the same road and with same speeds. They meet again 4km from B. Find the distance between the cities A and B.

**Q20.** Square ABCD with side length 2 is inscribed in a circle, as shown. Using each side of the square as a diameter, semi-circle arcs are drawn. Find the area of the shaded region outside and inside the semi-circles.



\*\*\*\*\*END OF PAPER\*\*\*\*\*

NOTE: The **Solution Key** of this paper will be available on School's blog [www.crpfpsrohini.blogspot.in](http://www.crpfpsrohini.blogspot.in) today after 6 pm. The **Result** will be declared on 30 November 2012 and will be available on School's blog.