CRPF PUBLIC SCHOOL, ROHINI

THIRD InTRa ScHool MaTHeMaTIcS olyMplaD 2012

CLASS XI

Max. Marks: 50 **Max. Time: 1 hour 30 minutes**

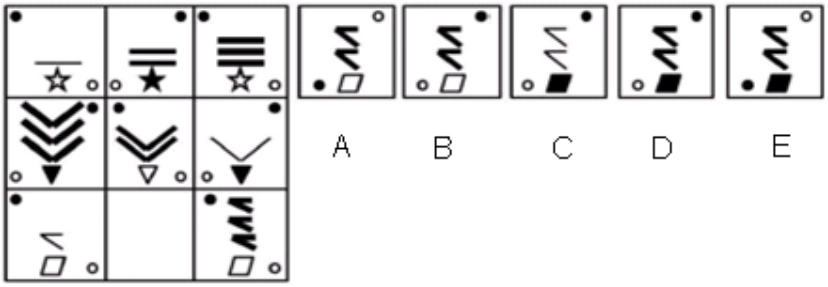
General Instructions:

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. Which of the five boxes on the right completes the empty box on the left?

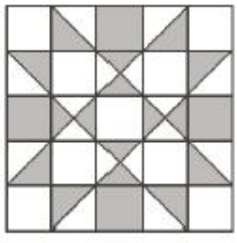


Q2. The greatest number of Fridays that can occur in a 75 day period is:

(A) 15 (B) 13 (C) 12 (D) 11 (E) 9

Q3. The diagram shows a square quilt that is made up of identical squares and two sizes of right angled isosceles triangles. What percentage of quilt is shaded?

(A) 36% (B) 40% (C) 44% (D) 48% (E) 50%



Q4. There are 30 people in a room, 60% of whom are men. If no men enter or leave the room, how many women must enter the room so that 40% of the total number of people in the room is men?

(A) 10 (B) 6 (C) 20 (D) 12 (E) 15

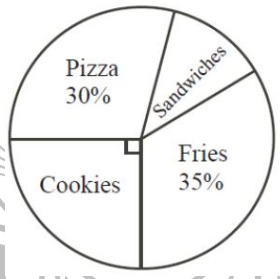
Q5. Oranges are placed in a Pyramid like stack with each layer completely filled. The base is a rectangle that is 5 oranges wide and 7 oranges long. Each orange, above the first layer rests in a pocket formed by four oranges in the layer below, as shown .The last layer is a single row of oranges. The Total number of oranges in the stack is:

(A) 53 (B) 80 (C) 82 (D) 85 (E) 105

Q6. If $x^2 = 8x + y$ and $y^2 = x + 8y$ with $x \neq y$, then value of $x^2 + y^2$ is:

(A) 9 (B) 49 (C) 63 (D) 21 (E) 56

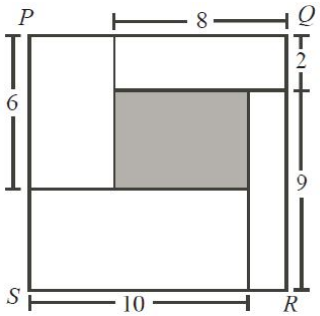
Q7. The circle graph shown illustrates the results of a survey taken to determine favourite cafeteria food. How many of the 200 students surveyed said that their favourite food was sandwiches?



(A) 10 (B) 20 (C) 35 (D) 50 (E) 70

Q8. In the diagram PQRS is a square. Square PQRS is divided into 5 rectangles as shown. The area of the shaded rectangle is:

(A) 49 (B) 28 (C) 22 (D) 57 (E) 16



Q9. If m and n are consecutive positive integers and $n^2-m^2 > 20$, then the minimum possible value of $n^2 + m^2$ is:

(A) 29 (B) 181 (C) 265 (D) 23 (E) 221

Q10. Three real numbers a, b, and c have a sum of 114 and a product of 46656. If b= ar and $c = ar^2$ for some real number r, then the value of a + c is:

(A) 78 (B) 76 (C) 24 (D) 54 (E) 36

Q11. Fifty numbers have an average of 76. Forty of these numbers have an average of 80. The average of the other ten numbers is :

(A) 60 (B) 4 (C) 72 (D) 40 (E) 78.

Q12. The number of positive integers p for which $-1 < \sqrt{p} - \sqrt{100} < 1$ is:

(A) 19 (B) 21 (C) 38 (D) 39 (E) 78 .

Q13. Rohan ate a total of 120 peanuts over four consecutive nights. Each night he ate 6 more peanuts than the night before. How many peanuts did he eat on the fourth night?

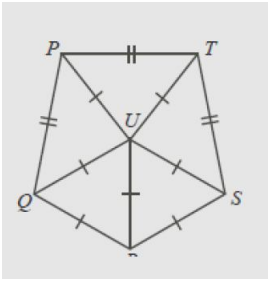
(A) 42 (B) 39 (C) 30 (D) 36 (E) 33

Q14. If $\frac{x-y}{z-y} = -10$, then the value of $\frac{x-z}{y-z}$ is:

(A) 11 (B) -10 (C) 9 (D) -9 (E) 10

Q15. In the diagram, ΔQUR and ΔSUR are equilateral triangles. Also ΔQUP, ΔPUT and ΔTUS are isosceles triangles with PU = QU = SU = TU and QP= PT = TS. The measure of $\angle$UST in degrees is:

(A) 50 (B) 54 (C) 60 (D) 70 (E) 80



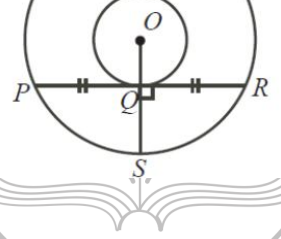
SECTION – B

Q16. Mini and Saloni were once the same height. Since then, Saloni grew 20% taller and Mini's height increased by half as many centimetres as Saloni's height increased. Saloni is now 180 cm tall. How tall in cm is Mini now?

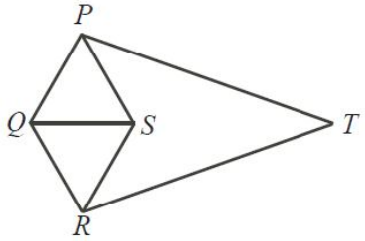
Q17. There is one odd integer N between 400 and 600 that is divisible by both 5 and 11. Find the sum of the digits of N.

Q18. If $x+1=(Ax+B)(x-1)+C(x^2+1)$ holds true for all x, find the value of $A+B+C$.

Q19. In the diagram, the two circles are centred at O, point S is on the larger circle .Point Q is the point of intersection of OS and the smaller circle. Line segment PR is a chord of the larger circle and touches (ie is tangent to) the smaller circle at Q, note that OS is the perpendicular bisector of PR, if PR = 12 and QS = 1, then find the radius of the larger circle.



Q20. In the diagram PQ = QR = RS = SP = SQ = 6 and PT = RT = 14. Find the length of ST.



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

NOTE: The **Solution Key** of this paper will be available on School's blog **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.