

CRPF PUBLIC SCHOOL, ROHINI

SECOND Intra School Mathematics Olympiad 2011

CLASS IX

Max. Marks: 50

Max. Time: 1 hour 30 minutes

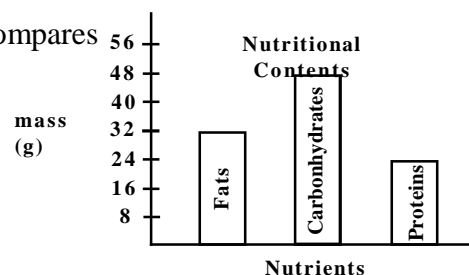
General Instructions:

- 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.
- Q16-20 (Section B) each question carries 4 mark. You are to give the complete solution. Marking will be done stepwise.

SECTION – A

Q.1 The graph shows the nutritional contents of a burger. Which ratio compares the mass of fats to the mass of carbohydrates ?

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



Q.2 If A is greater than B by 20%, then B is less than A by

- (A) 20% (B) $16\frac{2}{3}\%$ (C)) 10%
 (d) $83\frac{1}{3}\%$ (E) 12%

Q.3 If $a^3 + b^3 + c^3 = 3abc$ and $a + b + c \neq 0$, then

- (A) $abc = 0$ (B) $a - b - c = 0$ (C) $a = b = c$
 (D) $a + b - c = 0$ (E) $a + bc = 0$

Q.4 What is 'x' :
$$\frac{1 + \frac{1-x}{2}}{\frac{3}{4}} = 1$$

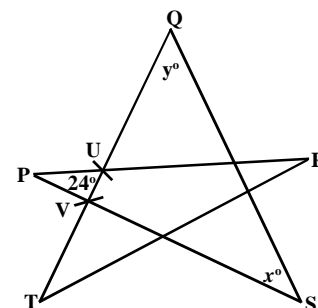
- (A) 21 (B) 200 (C) 31
 (D) 20 (E) none of these

Q.5 The first four terms of a sequence are 1, 4, 2 and 3. Beginning with the fifth term in the sequence, each term is the sum of the previous four terms. Therefore, the fifth term is 10. What is the eighth term ?

- (A) 66 (B) 65 (C) 69
 (D) 134 (E) 129

Q.6 In figure; PR, PS, QS, QT and RT are straight line – segments. QT intersects PR and PS at U and V respectively. If $PU = PV$, $\angle UPV = 24^\circ$, $\angle PSQ = x^\circ$, $\angle TQS = y^\circ$. What is $x + y$?

- (A) 48 (B) 66 (C) 72
 (D) 78 (E) 156



Q.7 In figure; only 'O' may be moved to any unoccupied space. What is the smallest number of O's that must be moved so that each row and each column contains three O's ?

- (A) 1 (B) 2 (C) 3
 (D) 4 (E) 5

O	O	O	O	
O	O	O		O
O	O			
O	O		O	
		O	O	

Q.8 When the number $5.0\overline{76}$, $5.\overline{076}$, 5.076 , 5.07 , $5.\overline{076}$ are arranged in increasing order, the number in the middle is

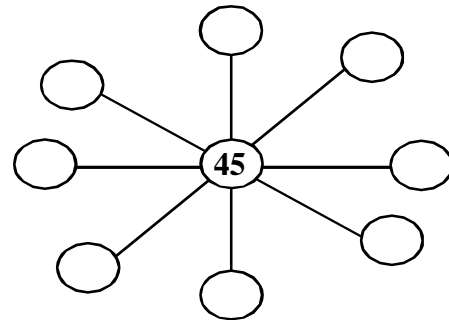
- (A) $5.0\overline{76}$ (B) $5.\overline{076}$ (C) 5.07
 (D) 5.076 (E) $5.\overline{076}$

Q.9 If Raju spends $\frac{1}{3}$ of his day sleeping, $\frac{1}{4}$ of his day studying and $\frac{1}{8}$ of his day eating. How many hours in the day does he has left ?

- (A) 4 (B) 6 (C) 5
 (D) 7 (E) 9

Q.10 Different positive integers can be written in the eight empty circles so that the product of any three integers in a straight line is 3240. What is the largest possible sum of the eight numbers surrounding 45 ?

- (A) 211
 (B) 156
 (C) 239
 (D) 159
 (E) 160



Q.11 If $\sqrt{2^n} = 32$, then $\frac{n-1}{n}$ is equal to

- (A) 9 (B) 0.9 (C) 10
 (D) $\frac{10}{9}$ (E) $\frac{9}{100}$

Q.12 Rani rolls a standard 6 – sides die. Bob rolls a second standard 6 – sides die. Rani wins if the value shown differ by 1. What is the probability that Rani wins ?

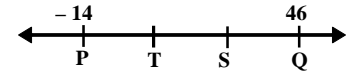
- (A) $\frac{1}{3}$ (B) $\frac{2}{9}$ (Cc) $\frac{5}{18}$
 (D) $\frac{1}{6}$ (E) $\frac{5}{36}$

Q.13 The value of $\frac{.83 \times .83 \times .83 + .17 \times .17 \times .17}{.83 \times .83 - .83 \times .17 + .17 \times .17}$:

- (A) 10 (B) .25 (C) 1
 (D) .66 (E) none

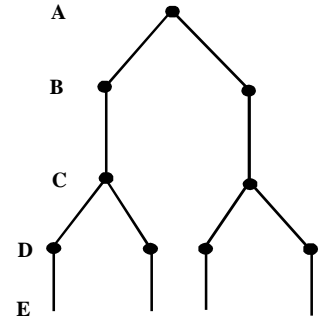
Q.14 On the number line, S is three – quarters of the way from P to Q. Also, T is one – third of the way from P to Q, what is the distance along the number line from T to S ?

- (A) 20 (B) 15 (C) 6
 (D) 25 (E) 31



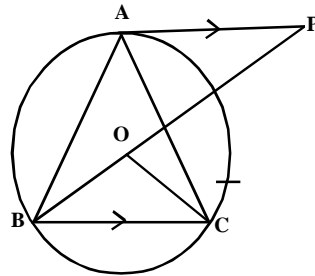
Q.15 In the diagram, there are 26 levels, labelled A, B, C,Z. There is one dot on level A. Each of levels B, D, F, H, J, and Z contains twice as many dots as the level immediately above. Each of levels C, E, G, I, K, and Y contains the same number of dots as the level immediately above. How many dots does level Z contain ?

- (A) 1024
 (B) 2048
 (C) 4096
 (D) 8192
 (E) 16384

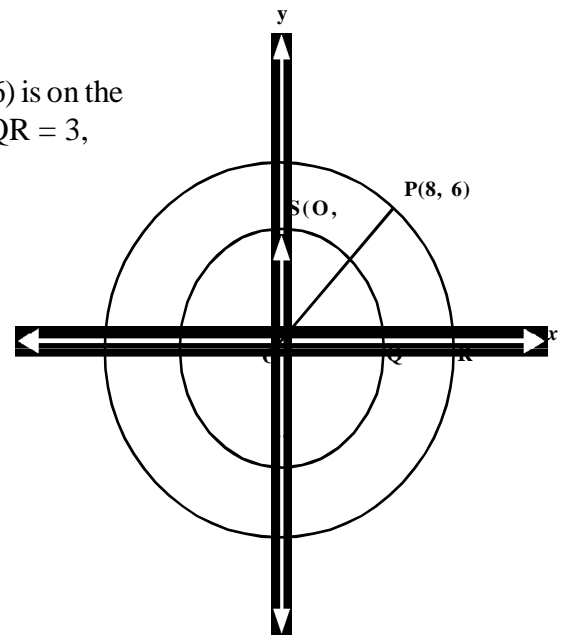


SECTION – B

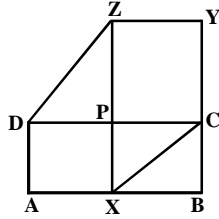
Q.16 In figure, O is the circumcentre of ΔABC , BO produced meets a line through A parallel to BC at P. By joining OC, find the value of $\angle BAC + \angle APB$.



Q.17 Two circles are centered at the origin as shown. The point P (8, 6) is on the larger circle and the point S(O, k) is on the smaller circle. If QR = 3, what is the value of k ?



- Q.18 In the given figure, $\text{ar}(\parallel^{\text{gm}} ABCD) = \text{ar}(\parallel^{\text{gm}} XBYZ)$ parallelograms ABCD and XBYZ have $\angle B$ as common, so that AXB and BCY are straight lines. Then prove that $DZ \parallel XC$



- Q.19 The distance from Delhi to Mathura is 150 km. Ram leaves Delhi at 1 : 00 p.m. and drives at a speed of 80 km / hr for the first 60 km. How fast must he travel for the remainder of the trip to reach Mathura at 3 : 00 p.m. ?
- Q.20 P, Q, R, S and T are five different integers between 2 and 19 inclusive.
- P → P is a two digit prime number whose digits adds up to a prime number.
 - Q → Q is a multiple of 5.
 - R → R is an odd number, but not a prime number.
 - S → S is the square of a prime number.
 - T → T is a prime number that is also the mean of P and Q.
- Which number is largest ?

NOTE: The **Solution Key** of this paper will be available on School's blog www.crpfpsrohini.blogspot.com today after 6 pm. The **Result** will be declared on 22 December (Date of Birth of Great Indian Mathematician Ramanujan) and will be available on School's blog.