



INSTITUTE OF MATHEMATICS EDUCATION
JUNIOR MATHS OLYMPIAD – 2024 (Primary Level)

Std. : V and VI
 Time : 2 Hours

Question Paper

Date : 04.02.2024
 Total Marks : 100

Q.1. Decipher the alphabets for the numbers. Each alphabet represents a unique non negative integer. [Take R = 6] **(6 marks)**

$$\begin{array}{r}
 P O I N T \\
 + \quad Z E R O \\
 \hline
 E N E R G Y
 \end{array}$$

Q.2. Find the highest power of 576 in 200! **(6 marks)**

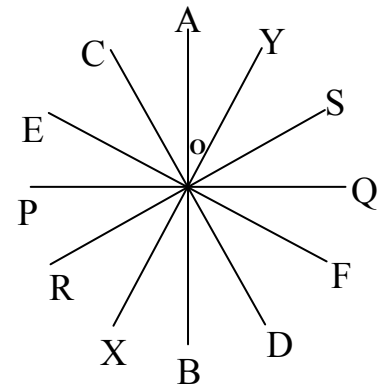
Q.3. Find at least five pairs of 3 digit numbers whose LCM is 1800. **(6 marks)**

Q.4. In ΔABC , M is mid - point of side BC. Prove that $AB + BC + AC > 2 AM$ **(6 marks)**

Q.5. Six seats are vacant on a straight bench. Find the number of ways three students A, B and C occupy three seats so that A and B do not sit together. **(6 marks)**

Q.6. Check whether 1137996457 and 1356830774 are divisible by 7, 13, 27 and 37 using tests of divisibility and find their H.C.F. **(8 marks)**

Q.7. Six lines AB, CD, EF, PQ, RS and XY pass through a given point O. The angles formed by any two adjacent lines are equal. Find the number of
 (i) right angles,
 (ii) acute angles and
 (iii) obtuse angles **(8 marks)**



Q.8.

M	A	T	H	M	A	T	H
+	M	A	T	H	M	A	T
+	M	A	T	H	M	A	
+	M	A	T	H	M		
+	M	A	T	H			
+	M	A	T				
+	M	A					
+	M						
* * * * 5 * * *							

Each of the alphabet M, A, T, H represent different non-zero digits. It is given that
 $M + A + T + H = 11$
 $M + A + H = 10$
 $M + A = H$
 Then find the answer of the sum given below. **(8 marks)**

Q.9. Evaluate : $\frac{7}{4} + \frac{59}{28} + \frac{213}{70} + \frac{523}{130} + \frac{1043}{208} + \frac{1827}{304} = ?$ **(8 marks)**

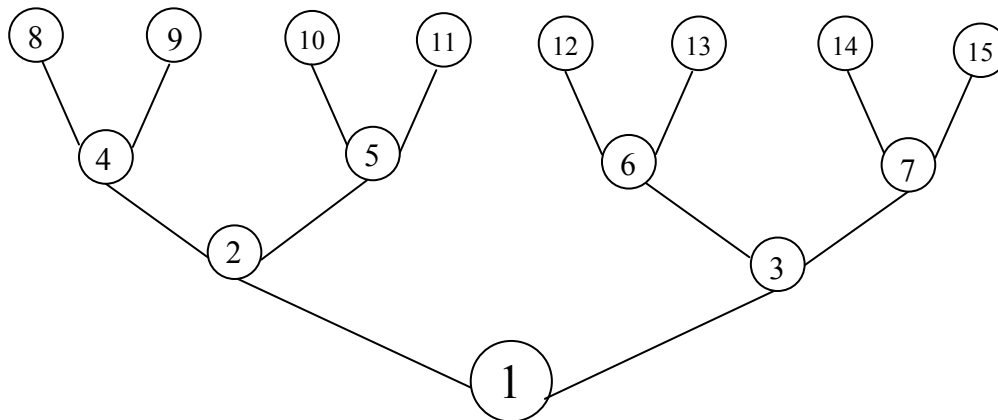
Q.10. The sequence is

$$\left(\frac{1}{5}\right), \left(\frac{1+2}{5}\right), \left(\frac{1+2+3}{5}\right), \left(\frac{1+2+3+4}{5}\right), \dots, \left(\frac{1+2+3+\dots+24}{5}\right), \left(\frac{1+2+3+\dots+25}{5}\right), \dots \text{ so on}$$

$T_1 \qquad T_2 \qquad T_3 \qquad T_4 \qquad \dots \qquad T_{24} \qquad T_{25}$

Find (i) T_{50} and (ii) the sum of first 25 terms of this sequence. **(8 marks)**

Q.11. See the following number tree. The first row contains number 1. The second row contains the numbers 2, 3. The third row contains the numbers 4,5,6,7 and so on. Find the sum of the numbers in the sixth row.



(10 marks)

Q.12. (i) $489_{11} = (X)_5$ and (ii) $728_9 = (Y)_5$ and (iii) $429_{12} = (Z)_5$ is given. If $(X + Y + Z)_5 = (A)_7$, then find value of A.

(10 marks)

Q.13 In the figure given above, ABCD is a quadrilateral and BPDQ is a parallelogram. Let AR = 50 cm, CQ = 70 cm, BR = 60 cm, and PR = 40 cm. Also $AC \perp BP$. If the area of the quadrilateral ABCD is $15,600 \text{ cm}^2$, then find the area of the parallelogram BPDQ (in cm^2).

(10 marks)

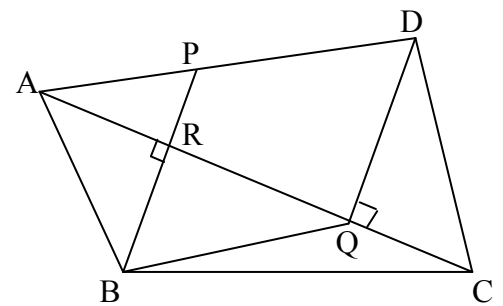


Figure not to scale