



# INTSO EDUCATION

MATHEMATICS TALENT SEARCH OLYMPIAD(MTSO) 2015 - 2016

STAGE - 1

TIME : 60 min.

CLASS : VII

Max. Marks : 50

### Instructions:

- ⇒ Fill the OMR sheet completely and carefully.
- ⇒ Each question carries one mark and has only one correct answer. No negative marks.
- ⇒ The question paper contains 50 questions to be answered in 60 minutes.

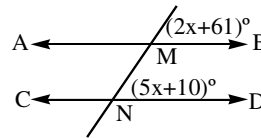
1. Arrange the following fractions in ascending order  $\frac{5}{8}, \frac{5}{6}, \frac{7}{4}, \frac{3}{5}$  [ ]
- 1)  $\frac{3}{5} < \frac{5}{6} < \frac{5}{8} < \frac{7}{4}$     2)  $\frac{5}{6} < \frac{3}{5} < \frac{5}{8} < \frac{7}{4}$     3)  $\frac{5}{8} < \frac{5}{6} < \frac{3}{5} < \frac{7}{4}$     4)  $\frac{3}{5} < \frac{5}{8} < \frac{5}{6} < \frac{7}{4}$
2. Simplifying the value of  $4\frac{5}{6} - 2\frac{3}{8} + 3\frac{7}{12}$  [ ]
- 1)  $\frac{24}{145}$     2)  $\frac{145}{23}$     3)  $\frac{145}{24}$     4)  $\frac{144}{145}$
3. A rectangular sheet of paper is  $12\frac{1}{2}$  cm long and  $10\frac{2}{3}$  cm wide then its perimeter is [ ]
- 1) 130 cm    2)  $\frac{139}{3}$  cm    3)  $\frac{139}{2}$  cm    4) 139 cm
4. Convert  $(169)_{10}$  to in base 7 [ ]
- 1)  $(332)_7$     2)  $(462)_7$     3)  $(331)_7$     4)  $(365)_7$
5. Shikha has read  $\frac{3}{4}$  of a book consisting of 288 pages. How many pages are still left [ ]
- 1) 72    2) 85    3) 82    4) 92
6. If  $24.125 = 24 + \frac{A}{10} + \frac{B}{100} + \frac{C}{1000}$  then  $A + B + C =$  [ ]
- 1) 3    2) 6    3) 13    4) 8
7.  $\left(\frac{125}{8}\right)^5 \times \left(\frac{125}{8}\right)^n = \left(\frac{5}{2}\right)^{18}$  then n = [ ]
- 1) 3    2) 13    3) 1    4) 5
8. A number when divided by 899 gives a remainder 63. The remainder when this number is divided by 29 is [ ]
- 1) 6    2) 7    3) 8    4) 5
9.  $(-1)^{301} + (-1)^{302} + (-1)^{303} + \dots + (-1)^{400} =$  [ ]
- 1) 1    2) 101    3) 100    4) 0

10. The decimal notation of 5 kg 5 g is [ ]  
 1) 5.5                      2) 5.05                      3) 5.005                      4) 5.0005

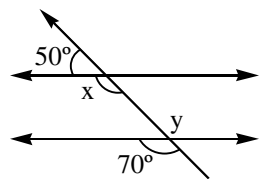
11. An angle when added to one - sixth of its complementary angle equals to  $40^\circ$  then the angle is [ ]  
 1)  $120^\circ$                       2)  $50^\circ$                       3)  $30^\circ$                       4)  $60^\circ$

12. The perimeter of a triangle is [ ]  
 1) greater than sum of its altitudes                      2) less than the sum of its altitudes  
 3) equal to the sum of its altitudes                      4) none of these

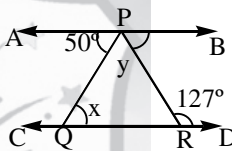
13. What value of x make  $\overline{AB}$  parallel to  $\overline{CD}$  [ ]  
 1)  $x = 20^\circ$                       2)  $x = 25^\circ$   
 3)  $x = 17^\circ$                       4)  $x = 71^\circ$



14. Find the values of x and y from the given figure [ ]  
 1)  $x = 130^\circ, y = 70^\circ$   
 2)  $x = 50^\circ, y = 60^\circ$   
 3)  $x = 180^\circ, y = 50^\circ$   
 4)  $x = 70^\circ, y = 50^\circ$



15. From the given figure  $\overline{AB} \parallel \overline{CD}$  and  $\angle APQ = 50^\circ$  and  $\angle PRD = 127^\circ$  then the values of x and y [ ]  
 1)  $x = 127^\circ, y = 50^\circ$   
 2)  $x = 50^\circ, y = 77^\circ$   
 3)  $x = 63^\circ, y = 130^\circ$   
 4)  $x = 77^\circ, y = 177^\circ$



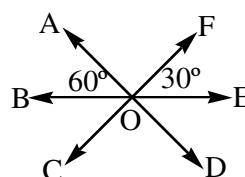
16. If  $3^a + 3^b = 756, 7^a + 2^c = 375$  and  $5^a + 3 = 128$  then the value of  $a+b+c$  is [ ]  
 1) 12                      2) 14                      3) 18                      4) 20

17. The length of the internal angular bisector of  $\angle A$  of  $\Delta ABC$  is [ ]  
 1)  $\frac{2}{b+c} \sqrt{bc(s(s-a))}$                       2)  $\frac{2}{b-c} \sqrt{bc(s(s-b))}$   
 3)  $\frac{2}{b+c} \sqrt{bc(s(s-b))}$                       4)  $\frac{2}{b-c} \sqrt{bc(s(s+b))}$

18. The height of an equilateral  $\Delta ABC$  with side 'a' units is [ ]  
 1)  $\frac{1}{2}a$  units                      2)  $\sqrt{3}a$  units                      3)  $\frac{\sqrt{3}}{2}a$  units                      4)  $\frac{\sqrt{3}}{4}a^2$  units

19. The length of median of  $\Delta ABC$  through vertex 'A' is [ ]  
 1)  $\frac{1}{2} \sqrt{2b^2 + 2c^2 + a^2}$                       2)  $\sqrt{a^2 - 2b^2 - 2c^2}$                       3)  $\frac{1}{2} \sqrt{2b^2 + 2c^2 - a^2}$                       4)  $\sqrt{b^2 + c^2 - a^2}$

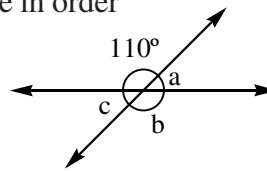
20. In given figure  $\overline{AD}, \overline{BE}$  and  $\overline{CF}$  are three concurrent lines and 'O' is point of concurrency and  $\angle AOB = 60^\circ, \angle FOE = 30^\circ$  then  $\angle COD =$  [ ]



- 1)  $30^\circ$   
 2)  $90^\circ$   
 3)  $60^\circ$   
 4)  $120^\circ$

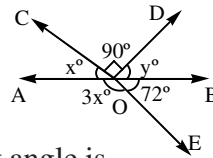
21. In the given figure the values of angles a, b, c are in order [ ]

- 1)  $70^\circ, 110^\circ, 70^\circ$   
 2)  $110^\circ, 70^\circ, 70^\circ$   
 3)  $70^\circ, 70^\circ, 110^\circ$   
 4)  $110^\circ, 110^\circ, 70^\circ$



22. In the adjacent figure given  $\angle COD = 90^\circ$ ,  $\angle BOE = 72^\circ$  and  $\overline{AOB}$  is a straight line then the values of  $\angle AOC$ ,  $\angle BOD$  and  $\angle AOE$  [ ]

- 1)  $36^\circ, 108^\circ, 54^\circ$       2)  $36^\circ, 54^\circ, 108^\circ$   
 3)  $45^\circ, 45^\circ, 108^\circ$       4)  $30^\circ, 60^\circ, 108^\circ$



23. The supplementary angle of four third of a right angle is [ ]

- 1)  $120^\circ$       2)  $135^\circ$       3)  $30^\circ$       4)  $60^\circ$

24. If 'O' is a point inside the triangle then  $OA + OB + OC$  is greater than [ ]

- 1)  $AB + BC + CA$       2)  $\frac{1}{2}(AB + BC + CA)$       3)  $\frac{1}{4}(AB + BC + CA)$       4)  $\frac{1}{3}(AB + BC + CA)$

25. Which of the following figures are not always similar [ ]

- 1) Two line segments      2) Two squares      3) Two triangles      4) Two circles

26. The hypotenuse 'c' and one side 'a' of a right angled triangle are consecutive positive integers, the square of the 3<sup>rd</sup> side is [ ]

- 1)  $c - a$       2)  $ca$       3)  $c+a$       4)  $\frac{c}{a}$

27. In an equilateral triangle  $\triangle ABC$  the side BC is trisected at 'D' then  $AD^2 =$  [ ]

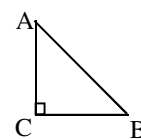
- 1)  $7AB^2$       2)  $\frac{7}{9}AB^2$       3)  $9AB^2$       4)  $\frac{9}{7}AB^2$

28. In a  $\triangle ABC$ ,  $\angle A = 60^\circ, \angle B = 45^\circ, \angle C = 75^\circ$  then which is the greatest side is [ ]

- 1) AB      2) BC      3) CA      4) we can't say

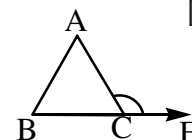
29.  $\triangle ABC$  is a right angled isosceles triangle and right angle at 'C' then [ ]

- 1)  $AB^2 = AC^2$       2)  $AB^2 = BC^2$   
 3)  $AB^2 = 2AC^2$       4)  $AB^2 = 3AC^2$



30. In an equilateral triangle  $\triangle ABC$  BC is produced up to E then  $\angle ACE = ?$  [ ]

- 1)  $60^\circ$       2)  $90^\circ$   
 3)  $100^\circ$       4)  $120^\circ$



31. Given  $(a-5)^2 + (b-c)^2 + (c-d)^2 + (b+c+d-9)^2 = 0$  then  $(a+b+c)(b+c+d)$  is [ ]

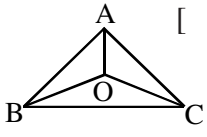
- 1) 0      2) 11      3) 20      4) 99

32. If  $\frac{x}{2} - 1 = \frac{x}{3} + 4$  then x = [ ]

- 1) 10      2) 30      3) 20      4) 15

33. If  $\frac{3x}{10} + \frac{2x}{5} = \frac{7x}{25} + \frac{29}{25}$  then x = [ ]

- 1)  $\frac{58}{21}$       2)  $\frac{21}{58}$       3)  $\frac{49}{21}$       4)  $\frac{47}{22}$

34. Mona's father is thrice as old as Mona. After 12 years he will be just twice his daughter then their present ages are [ ]  
 1) 10, 30                      2) 12, 36                      3) 15, 45                      4) 13, 39
35. A black and white photograph is 70% black & 30% white. It is enlarged 3 times. The percentage of white in the enlargement is [ ]  
 1) 90%                      2)  $66\frac{2}{3}\%$                       3)  $33\frac{1}{2}\%$                       4) 30%
36. Two-thirds of a number is greater than one-third of the number by 5, the number is [ ]  
 1) 10                      2) 5                      3) 15                      4) 12
37. A student has to score 30% marks to get through in an examination. If he gets 30 marks & fails by 30marks the maximum marks set for the examination is [ ]  
 1) 90                      2) 200                      3) 250                      4) 125
38.  $2(2n + 5) = 3(3n - 10)$  then n = [ ]  
 1) 5                      2) 3                      3) 7                      4) 8
39. The length of a rectangle is 3 times its width and its perimeter is 56m, then the length is [ ]  
 1) 7m                      2) 14m                      3) 21m                      4) 28m
40. If supplementary angles are differed by  $40^\circ$ , the measure of the larger angle is \_\_\_\_ [ ]  
 1)  $70^\circ$                       2)  $80^\circ$                       3)  $110^\circ$                       4)  $100^\circ$
41. A cuboid has how many edges [ ]  
 1) 6                      2) 12                      3) 8                      4) 10
42. The name of the figure as shown in the following [ ]  
 1) Triangular prism                      2) triangular pyramid  
 3) equilateral triangle                      4) cylinder
- 
43. A sphere has how many vertices? [ ]  
 1) 1                      2) 2                      3) 3                      4) 0
44. An Isosceles triangle has equal sides 7cm long and the length of the 3<sup>rd</sup> side is an integer. The number of such triangles is [ ]  
 1) 12                      2) 10                      3) 11                      4) 13
45. Which type of dimensional figure is a cube ? [ ]  
 1) 1 dimensional                      2) 2 dimensional                      3) 3 dimensional                      4) 4 dimensional
46. If F,E,V denote respectively the number of faces, edges and vertices of a polyhedron then Eulers formula is [ ]  
 1)  $F - V + E = 2$                       2)  $F + V + E = 2$                       3)  $F - E + V = 2$                       4)  $E - F + V = 2$
47. In a polygon 6 angles are right angles and the remaining all angles are equal to  $200^\circ$  each. Then the number of sides of the polygon is [ ]  
 1) 12                      2) 15                      3) 16                      4) 10
48. The difference between the circumference and radius of a circle is 37 cm. Then the area of the circle is [ ]  
 1)  $111\text{cm}^2$                       2)  $148\text{cm}^2$                       3)  $154\text{cm}^2$                       4)  $258\text{cm}^2$
49. The area of circle is increased by  $22\text{cm}^2$  when its radius is increased by 1 cm the original radius of the circle is [ ]  
 1) 6 cm                      2) 3 cm                      3) 4 cm                      4) 3.5cm
50. The area of the square park whose perimeter is 320m. [ ]  
 1)  $3600\text{m}^2$                       2)  $4900\text{m}^2$                       3)  $6400\text{m}^2$                       4)  $8100\text{m}^2$