INTSO EDUCATION

MATHEMATICS TALENT SEARCH OLYMPIAD(MTSO) 2016 - 2017

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. If $\frac{1}{4}\times\frac{2}{6}\times\frac{3}{8}\times\frac{4}{10}\times\frac{5}{12}\times....\times\frac{31}{64}=\frac{1}{2^x}$, then the value of x is [ ]

   1) 24 2) 12 3) 36 4) 46

2. Among the following fractions, which is the largest [ ]

   1) $\frac{13}{16}$ 2) $\frac{7}{8}$ 3) $\frac{31}{40}$ d) $\frac{63}{80}$

3. If $x=\dfrac{2+\dfrac{1}{3\frac{4}{5}}}{2+\dfrac{1}{3+\dfrac{1}{1+\frac{1}{4}}}}$, then the value of x is [ ]

   1) 1 2) $\frac{3}{7}$ 3) $\frac{1}{7}$ 4) $\frac{8}{7}$

4. There exists positive integers x, y such that (3x + 2y) and (4x – 3y) are exactly divisible by

   1) 11 2) 7 3) 23 4) 17 [ ]

5. The G.C.D of $\frac{3}{16},\frac{5}{12},\frac{7}{18}$ is [ ]

   1) $\frac{105}{48}$ 2) $\frac{1}{4}$ 3) $\frac{1}{48}$ 4) $\frac{1}{144}$

6. What is missing figure given below $\frac{16}{7}\times\frac{16}{7}-\frac{\square}{7}\times\frac{9}{7}+\frac{9}{7}\times\frac{9}{7}=1$ [ ]

   1) 1 2) 7 3) 457 4) 32

7. Suppose a = $\frac{2}{3}b, b=\frac{2}{3}$c and c =$\frac{2}{3}d$. What would be the value of b as a fraction of d =

   1) $\frac{2}{3}$ 2) $\frac{4}{3}$ 3) $\frac{4}{9}$ 4) $\frac{8}{27}$ [ ]

8. The greatest number which divides 261, 933 and 1381 leaving remainder 5 in each case is
1) 128 2) 64 3) 32 4) 16 [ ]

9. If the L.C.M and H.C.F of two numbers are 1530 and 51. Then the number of such pairs are possible is [ ]
1) 2 2) 3 3) 4 4) 1

10. $2.8\overline{768}$ expressed as a rational number is [ ]

1) $2\frac{878}{999}$ 2) $2\frac{9}{10}$ 3) $2\frac{292}{333}$ 4) $2\frac{4394}{4995}$

11. The value of $0.\bar{2}+0.\bar{3}+0.\bar{4}+0.\bar{9}+0.\overline{39}$ is [ ]

1) $0.\overline{57}$ 2) $1\frac{20}{33}$ 3) $2\frac{1}{3}$ 4) $2\frac{13}{33}$

12. If N = $\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}+.......+\frac{1}{156}$, then the value of N is [ ]

1) $\frac{13}{12}$ 2) $\frac{12}{13}$ 3) $\frac{14}{13}$ 4) $\frac{13}{14}$

13. If a man spends $\frac{5}{6}^{th}$ part of money and then earns $\frac{1}{2}$ part of the remaining money. Then the part of the money with him now is [ ]

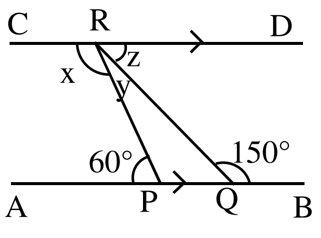
1) $\frac{1}{3}$ 2) $\frac{1}{2}$ 3) $\frac{1}{6}$ 4) $\frac{1}{4}$

14. The least fraction that must be added to $1\frac{1}{3}\div 1\frac{1}{2}\div 1\frac{1}{9}$ to make the result an integer is [ ]

1) $\frac{1}{5}$ 2) $\frac{2}{5}$ 3) $\frac{3}{5}$ 4) $\frac{4}{5}$

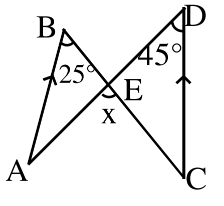
15. Two supplementary angles are in the ratio 2 : 7. The largest angle is [ ]
1) 100° 2) 120° 3) 140° 4) 40°

16. In the following figure AB || CD the value of y is [ ]



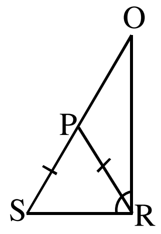
1) 115°
2) 35°
3) 30°
4) 75°

17. In the adjoining diagram, AB || CD. The value of x is [ ]



1) 70°
2) 60°
3) 50°
4) 110°

18. PSR is an isosceles triangle in which PS = PR.SP is produced to 'O' such tht PO = SP, then $\angle SRO$ = [ ]

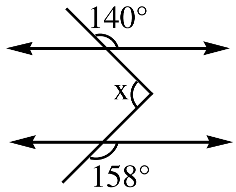


1) 60°
2) 70°
3) 120°
4) 90°

19. In $\Delta ABC, \angle ACB$ = 20° and $\angle CAB$ = 40° AC is extended to P such that AP = AC + 2CB. The measure of $\angle ABP$ is [ ]

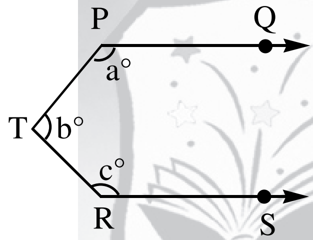
1) 100° 2) 90° 3) 110° 4) 80°

20. If p ‖ q in the figure shown, then x = [ ]



1) 18°
2) 22°
3) 62°
4) 55°

21. If ray PQ and RS are parallel as given in figure, then a + b + c = [ ]



1) 90°
2) 180°
3) 270°
4) 360°

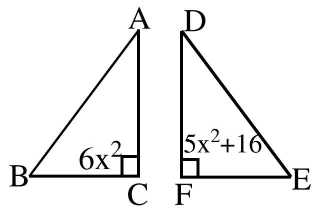
22. If P and Q are the mid points of sides CA and CB respectively of a ΔABC right angled at C then $4(AQ^2 + BP^2)$ = [ ]

1) $4AB^2$ 2) $2AB^2$ 3) $3AB^2$ 4) $5AB^2$

23. If the sides of a right angled triangle are x, x + 1 and x – 1, then the hypotenuse is [ ]

1) 5 2) 4 3) 1 4) 0

24. If $\Delta ACB \cong \Delta DFE$, then $\angle F$ = [ ]

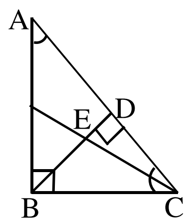


1) 4°
2) 96°
3) 100°
4) 60°

25. The degree measure of each of the three angles of a triangle is an integer. Which of the following could not be the ratio of their measures? [ ]

1) 2 : 3 : 4 2) 3 : 4 : 5 3) 5 : 6 : 7 4) 6 : 7 : 8

26. $AB \perp BC, BD \perp AC$ and CE bisects $\angle C.\angle A$ = 30°, then $\angle CED$ = [ ]



1) 30°
2) 60°
3) 45°
4) 65°

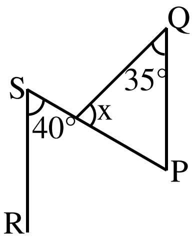
27. In ΔABC medians BE and CF intersect at G. If the straight line AGD meets BC in D, in such a way that GD = 1.5cm, then the length of AD is [ ]

1) 2.5cm 2) 3cm 3) 4cm 4) 4.5cm

28. In a ΔABC, if $\angle C = 110°$ which one of the following statement is correct? [ ]

1) $AB^2 > AC^2 + BC^2$ 2) $AB^2 < AC^2 + BC^2$
3) $AC^2 > AB^2 + BC^2$ 4) $BC^2 > AB^2 + AC^2$

29. In the given figure PQ || RS. $\angle RSF = 40°$, $\angle PQF = 35°$ and $\angle QFP = x°$, then the value of x is [ ]



1) 75°
2) 105°
3) 135°
4) 140°

30. If in ΔABC, AB = 2, AC = 4 and the median from A to BC is equal to BC. Then the length of BC

1) $\sqrt{7}$ 2) $\sqrt{8}$ 3) $\sqrt{10}$ 4) $\sqrt{18}$ [ ]

31. If 15, 17, 25 are the lengths of two sides of a triangle and the altitude to the 3rd side. Then the area of the triangle is [ ]

1) 210 2) 300 3) 180 4) 220

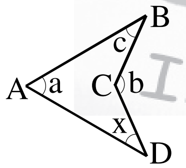
32. The sum of the interior angles of a polygon is 1620°. The number of sides of the polygon are

1) 9 2) 11 3) 15 4) 12

33. ABCD is a parallelogram . If P be a point on CD such that AP = AD, then the measure of $\angle PAB + \angle BCD$ is [ ]

1) 180° 2) 225° 3) 240° 4) 135°

34. In the given figure what is the value of x [ ]



1) b – a – c
2) b – a + c
3) b + a – c
4) a + b + c

35. The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87. What is the lowest score [ ]

1) 30 2) 35 3) 40 4) 38

36. If Laxmi's father is 49 years old. He is 4 years older than three times laxmi's age then the laxmi's age is [ ]

1) 15 2) 16 3) 20 4) 22

37. The sum of 3 times a number and 12 is 33. Then the number is [ ]

1) 7 2) 8 3) 9 4) 12

38. The sum of 3 consecutive integers is 12 more than twice the smallest integer then the smallest number is [ ]

1) 8 2) 9 3) 7 4) 11

39. What is the greatest positive integer n which makes $n^3 + 100$ divisible by n + 1 is [ ]

1) 890 2) 790 3) 900 4) 90

40. a, b, c, d are natural numbers such that a = bc, b = cd, c = ad and d = ab then (a + b)(b + c)(c + d)(d + a) is equal to [ ]

1) $(a + b + c + d)^2$ 2) $(a + b)^2 + (c + d)^2$
3) $(c + d)^2 + (b + c)^2$ 4) $(a + c)^2 + (b + d)^2$

41. If $(x - 7)^2 - (x + 8)^2 = 75$. The value of x is [ ]

1) 3 2) 1 3) – 3 4) – 1

42. The value of $a^2b(a^3 - a + 1) - ab(a^4 - 2a^2 + 2a) - b(a^3 - a^2 - 1)$ is [ ]

1) ab 2) ab^2 3) a 4) b

43. If 2n is an even number what are the odd numbers each side of it and the sum of two consecutive odd numbers is [ ]

1) 41, 43 2) 57, 59 3) 47, 49 4) 31, 33

44. The solid cube of sides 1cm, 6cm and 8cm are melted together to form a new cube the total surface area of the cube so formed is [ ]

1) 486cm^2 2) 386cm^2 3) 286cm^2 4) 490cm^2

45. A rectangular water reservoir contains18000 litres of water, if its base measures 4.5m by 2.5 m. The depth of water in it is [ ]

1)2.6m 2) 3.6m 3) 1.6m 4) 1.4m

46. Area of four walls of a room 10m long, 5m wide and 4m height is [ ]

1) 120m^2 2) 140m^2 3) 90m^2 4) 100m^2

47. Five cubes each of 5cm are placed adjascent to each other. The surface area of resulting cuboid is

1) 550cm^2 2) 540cm^2 3) 440 cm^2 4) 450 cm^2 [ ]

48. The size of a wooden block is 5cm by 10cm by 20cm. The number of such blocks will be required to construct a solid wooden cube of minimum size [ ]

1) 10 2) 9 3) 8 4) 7

49. A rectangular card board sheet measures 48cm × 36cm from each of its corners a square of 8cm is cut off. An open box is made of the remaining sheet. The volume of box is [ ]

1) 5120cm^3 2) 6400 cm^3 3) 8960 cm^3 4) 2560 cm^3

50. If the area of a circle and square are equal. Then the ratio of their perimeters is [ ]

1) 1 : 1 2) 2 : π 3) π : 2 4) $\sqrt{\pi}$: 2