

# **Sample Paper**

Class 8

**Unicus Mathematics Olympiad (UMO)** 

Section	Total Questions	Marks per Questions	Total Marks
Classic Section	40	1	40
Scholar Section	10	2	20
Grand Total	50		60



# **Classic Section (Each Question is 1 Mark)**

1. Ruhel spent \$7x on buying stationary items, \$28 in canteen and was left with \$14. How much money did he have initially? (Express in terms of x)

a.	\$(7x + 42)	b.	\$(7x + 14)
C.	\$2,744x	d.	\$(7x + 28)

2. The given figure ABCD is a parallelogram. If angle QPB = 84° and angle AQP is one-fourth of angle QPB, find angle AQD:



3. Which of the following is not a rational number?

a.	4	b3	
~	9	d <sup>3</sup>	
C.	0	u. — <u>-</u> 5	

4. Simplify the following:  $2\frac{1}{2} - 3\frac{1}{2} + 7\frac{1}{2}\left(4\frac{1}{2} - \frac{1}{2}\right)$ 

a. $10\frac{8}{15}$ c. $16\frac{17}{30}$ b. 12 d. 28	$1\frac{14}{15}$ $3\frac{8}{15}$

 If Robert buys 1 kg of orange from three different fruit vendors at the price of \$60, \$75 and \$80 per kg respectively, then find the average rate of 1 kg of oranges:

a.	\$67.67	b.	\$69.33
C.	\$71.67	d.	\$75.33

6. Look at the image given below. The lines m and n are perpendicular bisector of each other. Find the values of  $\angle$ (12y - 19) and  $\angle$ (6y + 1), respectively:



7. Find the value of angles x and y respectively from the figure given below:



8. Fill in the blank: Triangles ABD and ACD are congruent because of \_\_\_\_\_\_ congruence property.



a. SAS

9.	Simplify the following: $5^{0} + 5^{1} + 25^{4} \div 5^{3}$	
	a. 625 c. 3125	b. 631 d. 3131
10	. Simplify the following: $(3 \times 7^2 \times 11^5) / (21 \times 11^2)$	
	a. 11 <sup>3</sup> c. 7 <sup>2</sup> x 11 <sup>3</sup>	b. 7 x 11 <sup>3</sup> d. 7 <sup>2</sup> x 11 <sup>10</sup>

11. The value of [-243 + 121 - (-122) + 4 (124 ÷ 12)] is equal to:

a.	80.67	b. 41.33
C.	-202.67	d41.33

12. In the following expression, find the value of x: (x - 3)/4 + (x - 7)/5 - (x - 2)/7 = 7/10

a.	$8\frac{15}{43}$	b. $7\frac{16}{43}$
C.	$7\frac{22}{43}$	d. $6\frac{39}{43}$

13. Find the area of the trapezium:



#### 14. Find the area of the given parallelogram:



15. Arya bowled 7 games in a tournament. 149, 160, 180, 155, 160, 137, 158 What is the mode of his scores?	The list shows his scores in the 7 games:
a. 155	b. 158
c. 160	d. 156.5
16. Four sheets of 50 cm X 5 cm are to be a formed. What will be the area of inner particular to the area of inner particular to the area.	arranged in such a manner that a square could be art of the square so formed?
a. 2000 cm²	b. 2025 cm <sup>2</sup>
c. 1800 cm²	d. 2500 cm <sup>2</sup>
17. In statistics, a suitable graph for represe	enting the partitioning of total into sub parts is:
a. A bar graph	b. A pictograph
c. A pie chart	d. A line graph
18. What % of 40 is 16?	
a. 100%	b. 60%
c. 40%	d. 50%
<ol> <li>Plantation G has q durian trees of grade grade v. The total number of durian tree</li> </ol>	r, s durian trees of grade t and u durian trees of s in plantation G is:
a. p+q+r+s+t+u+v	b. p+r+u+v
c. q+s+u	d. r+t+v
20. A lends \$2,500 to B and a certain sum to	o C to the same time at 7% p.a. simple interest. If after
4 years, A altogether receives \$1,120 as	s interest from B and C, then the sum lent to C is:
a. \$700	b. \$1,500
c. \$4,000	d. \$6,500
21. A cistern can be filled up by one pipe in are kept open for 2 $1/_2$ hours. The part of	12 hours and by another in 8 hours. Both the pipes f the cistern filled up is:

a.	25 48	b.	5 6
C.	<u>25</u> 36	d.	12 25

22. The diagram given below shows two isosceles triangles. What is the sum of a and b?



23. The image given below shows a regular hexagon. The value of angles x, y and z are respectively:



24. A rectangular plank  $\sqrt{2}$  m wide is placed symmetrically on the diagonal of a square of side 8 metres as shown. What is the area of the plank?



25. The diameter of a bullock cart wheel is 14/11 m. This wheel makes 10 complete revolutions per minute. What would be the speed of the cart in km per hour?

a.	4.8	b.	9.6
C.	8.8	d.	2.4

26. Each edge of a cube is increased by 50%. The percentage increase in the surface area of the cube is:

a.	50	b.	125
C.	150	d.	225

27. A box contains 50 coloured stones. What is the total number of orange stones in the box if the probability of selecting an orange stone is 0.4?

a.	. 20	b.	15
C.	. 10	d.	40

28. From the following frequency table, find out how many students failed if the pass marks are 40:

Mark	0-19	20-39	40-49	50-59	60-89	90-100
Number of students	8	6	15	13	18	7
a. 29 c. 8			b. 7 d. 14	Ļ		

29. A man has a hundred dollars. He bought vegetables for \$26.75 and fruits for \$25.45. How much money he has left?

a.	\$47.80	b.	\$52.40
C.	\$73.25	d.	\$37.80

30. A bag contains 25 cents, 10 cents, and 5 cent coins in the ratio 1 : 2 : 3. If the total value of these is \$36, then what is the number of 25 cent coins?

a.	40	b. 45
C.	50	d. 60

31. The ratio of land to water for the whole earth is 1 : 2 and 2 : 3 in the northern hemisphere. What is the ratio of land to water in the southern hemisphere?

a. 4: 11	b. 1:3
c. 1:4	d. 4:7

32. Two equal sums of money were invested, one at 4% and the other at 4 1/2%. At the end of 7 years, the simple interest received from the latter exceeded that received from the former by \$31.50. The sum of money that was invested is:

a. \$1,000	b. \$500
c. \$750	d. \$900

33. Peter purchased a new car for \$750,000. After 2 years, he sold the car for 20% less than the original price. Find the selling price of the car:

a.	\$400,000	b.	\$500,000
C.	\$600,000	d.	\$650,000

34. In a rhombus DEMO,  $\angle$ DEO = 70°. What is the measure of  $\angle$ EMO?

a.	20°	b.	140º
c.	70°	d.	40°

35. If x: y = 5 : 3, then find the value of (8x - 5y)/(8x + 5y):

a.	7: 11	b.	11: 13
C.	5: 11	d.	13: 15

36. Look at the image given below. The measure of  $\angle$ XYC is equal to:



37. Which of the following fractions is less than  $\frac{7}{8}$  and greater than  $\frac{1}{3}$ ?

a.	$\frac{1}{4}$	b. $\frac{23}{24}$
C.	$\frac{11}{12}$	d. $\frac{17}{24}$

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38. If p = 3/5, q = 7/9 and r = 5/7, then which of the following options is correct?

a. p < q < r	b. q < r < p
c. p < r < q	d. r < q < p

39. The selling price of an article is 4/3 times its cost price. The gain per cent is:

a.	$20\frac{1}{3}\%$	b. $20\frac{1}{2}\%$
C.	$25\frac{1}{4}\%$	d. $33\frac{1}{3}\%$

40. The total number of girls from colleges D and E together are approximately what per cent of the total number of girls from colleges A, B and C together?



## Scholar Section (Each Question is 2 Marks)

41. Fill in the blank:

If 11 is subtracted from 5 times a number and it becomes the same as 4 subtracted from 7 times the number, then this fact can be represented as \_\_\_\_\_.

a. 5x - 11 = 4x - 7	b. 5x - 11 = 7x - 4
c. 11x - 5 = 4x - 7	d. 11x - 5 = 7x - 4

42. A rectangular garden is of dimension 60 m × 40 m. There are two roads 5 m wide each running in the middle of the garden, one parallel to the length and the other parallel to its breadth. If the cost of gravelling the road is \$5 per m<sup>2</sup>, then find the cost of gravelling both roads:

a. \$1,000	b. \$1,500
c. \$2,500	d. \$2,375

43. In the given figure, if ∠BOC =  $7x + 20^{\circ}$  and ∠COA =  $3x^{\circ}$ , then the value of x for which AOB becomes a straight line is:



44. A number is divided by three and multiplied by the square of a second number. The product is then divided into three. Write the algebraic term for the given statements using p as the first number and q as the second number:

a. 9pq²	b. pq²/3
c. pq²/9	d. 3pq <sup>2</sup>

45. Match Column A with Column B:

Colu	imn A	Column B			
a.	x:5::2:3	(p)	6/5		
b.	2:x::4:3	(q)	15/2		
C.	2:5::x:3	(r)	10/3		
d.	2:5:3:x	(s)	3/2		

a. (a) - (p), (b)- (q), (c) - (r), (d) - (s) c. (a) - (q), (b)- (s), (c) - (p), (d) - (r) b. (a) - (r), (b)- (p), (c) - (s), (d) - (q) d. (a) - (r), (b)- (s), (c) - (p), (d) - (q)

b. Only B and C d. A, B and C

- 46. Which of the following is true?
  - A. Triangle is a polygon.
  - B. An isosceles triangle can be obtuse.
  - C. All scalene triangles are acute.

c. Only A and B

<ul> <li>47. Following are steps while constructing a line set the following steps is/are INCORRECT?</li> <li>Step 1. First mark a point A on paper.</li> <li>Step 2. Place a ruler in such a way that its zero Step 3. Draw a line from point A of the measure Step 4. Now, name the endpoints as Q.</li> <li>Step 5. AB is the required line segment.</li> </ul>	gment of length 5 cm using a ruler. Which of point coincides with point A. s of 4.5 cm on the ruler.
a. Step 1	b. Step 3
c. Both Steps 3 and 4	d. Both Steps 4 and 5
48. Rubi decided to donate 16% of her monthly sala changed her mind and donated \$6567 which wa much is Rubi's monthly salary?	ary to an NGO. On the day of donation, she as 75% of what she had decided earlier. How
a \$50,000	b \$54,000
c. \$54,725	d. \$60,000
<ul> <li>49. The population of a town increases at a certain population of the town is 3600 and in 5 years' time 10 years' time?</li> <li>a. 5000</li> <li>c. 6400</li> </ul>	rate per cent per annum. The present me, it will become 4800. How much will it be in b. 6000 d. 7000

50. The simple interest on a certain sum for 8 months at 4% per annum is \$129 less than the simple interest on the same sum for 15 months at 5% per annum. The sum is:

a.	\$2,530	b.	\$2,400
c.	\$2,529	d.	\$3,600

# **Answer Key**

1.	а	2.	С	3.	С	4.	d	5.	С	6.	а	7.	а
8.	b	9.	d	10.	b	11.	b	12.	а	13.	а	14.	а
15.	С	16.	b	17.	С	18.	С	19.	С	20.	b	21.	а
22.	С	23.	С	24.	d	25.	d	26.	b	27.	а	28.	d
29.	а	30.	d	31.	а	32.	d	33.	С	34.	d	35.	С
36.	b	37.	d	38.	С	39.	d	40.	а	41.	b	42.	d
43.	а	44.	С	45.	d	46.	С	47.	С	48.	С	49.	С
50.	d												