UNICUS OLYMPIADS

Sample Paper

(2020-21)

Class 10

Unicus Mathematics Olympiad

Section – Class* *Syllabus covered	Total Questions	Marks per Questions	Total Questions
Classic Section – Class 9	28	1	28
Classic Section – Class 8	12	1	12
Scholar Section – Class 9	7	2	14
Scholar Section – Class 8	3	2	6
Grand Total	**50**		**60**

1. The ratio of milk and water is 3: 2 in a milkman's container. He adds some water in the solution and the volume of the content increases by 50%. Then he replaces 30 L of the resultant solution with. The resultant ratio of milk to water in the final solution is 3:7. Find the original volume of the solution:

a) 80 L
b) 130 L
c) 65 L
d) 160 L

Correct Answer: a *1 Mark*

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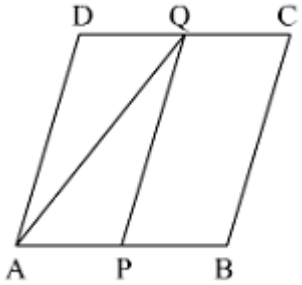
2. The given figure ABCD is a parallelogram. If ∠QPB = 84° and ∠AQP is one-fourth of ∠QPB, then find ∠AQD:



a) 49°
b) 55°
c) 63°
d) 72°

Correct Answer: c *1 Mark*

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3. The sum of the present ages of a person and his daughter is 42 years. Six years hence the ratio of their ages will be 7: 2. Find the difference between their present ages:

a) 38 years
b) 30 years
c) 24 years
d) 20 years

Correct Answer: b *1 Mark*

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4. Shivam went to the market and bought an iron sheet. Using this sheet he made a cylindrical tube open at both ends. The outer diameter is 16 cm and its length is 100 cm. Find how many cubic cm of iron has been used in making the tube if the iron sheet was 2 cm thick?

a) 1,000 cm^3
b) 2,200 cm^3
c) 4,400 cm^3
d) 8,800 cm^3

Correct Answer: d *1 Mark*

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5. Look at the following polynomial given below:
$f(x) = x^4 + 3x^3 + 2x^2 – ax + 3a + 7$
If it is divided by x + 1, then it leaves the remainder 19. Find the value of a and also find the remainder when p(x) is divided by x - 2:

a) 3, 58
b) 5, 31
c) 10, 62
d) 12, 72

Correct Answer: a *1 Mark*

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6. The members of a company went for a picnic. They collected some money for picnic by contribution. The money contributed by each member was equal to the cube of the total number of members. If the total collected amount was Rs. 74,088, then find the total number of members:

a) 22
b) 28
c) 42
d) 58

Correct Answer: c *1 Mark*

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7. Jai’s present age is 2/7th of his father’s present age. Jai’s brother is 3 years older than Jai. The respective ratio between the present ages of Jai’s father and Jai’s brother is 14: 5. Find Jai’s present age:

a) 6 year
b) 12 year
c) 18 year
d) 24 year

Correct Answer: b *1 Mark*

8. Look at the statements given below:

I. Point (3, 0) lies in the first quadrant.
II. The coordinates of point whose ordinate is -1/2 and abscissa is 1 are (-1/2, 1).
III. If we multiply or divide both sides of a linear equation with a non-zero number, then the solution of the linear equation changes in case of multiplication only.
IV. If angles A, B, C and D of a quadrilateral ABCD, taken in order are in the ratio 3: 7: 6: 4, then ABCD is a trapezium.

Which of the following statements is/are correct?

a) Only I and III
b) Only II
c) Only II and IV
d) Only IV

Correct Answer: d *1 Mark*

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9. Let PQRS is a parallelogram. Let x and y be positive integers such that $y < x < 2y$. Let $PR = 2xy$ and $QS = x^2 - y^2$ and $PQ = (x^2 + y^2)/2$?

Statement I. PR > QS
Statements II. PQRS is a rhombus.

Which one of the following is correct in respect of the above statements?

a) Both the statement I and II are true and statement II is the correct explanation of statement I.

b) Both the statement I and II are true but statement II is not the correct explanation of statement I.

c) Statement I is true but statement II is false.

d) Statement II is true but statement I is false.

Correct Answer: b *2 Marks*

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10. Arnav deposits some money in his account. He earns Rs. 540 as simple interest in 3 Years. If he earns a compound interest of Rs. 376.20 at the same rate of interest in 2 years, then find the amount:

a) Rs. 1,600
b) Rs. 1,800
c) Rs. 2,000
d) Rs. 2,100

Correct Answer: c *2 Marks*
