Roll No. .....

# 1034-B

# Class 10th Quarterly Examination 2022-23

# MATHEMATICS-100

(English Medium)

[Total No. of Questions: 23]
[Time: 03 Hours]

[Total No. of Printed Pages: 08]
[Maximum Marks: 75]

***Instructions-***

*(1) All questions are compulsory.*

*(2) Allotted marks for the questions are mentioned against them.*

*(3) Questions from Q.1 to Q.5 are objective type questions.*

*(4) The internal choice has been provided in each question from Q.6 to Q.23.*

Q.1 Choose the correct option - [1×6]

(1) The HCF of 96 and 404 is -

(a) 120 (b) 4

(c) 10 (d) 3

(2) If $\alpha$ and $\beta$ are the zeros of quadratic polynomial $ax^2 + bx + c$ then the value of $\alpha.\beta$ will be -

(a) $\frac{c}{a}$ (b) $\frac{b}{c}$

(c) $\frac{-b}{a}$ (d) $-\frac{a}{c}$

(3) If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ then the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ -

(a) has a unique solution

(b) has no solution

(c) has infinitely many solutions

(d) None of these

(4) If the roots of the quadratic equation $ax^2 + bx + c = 0$ are equal then the value of the discriminant of the equation will be -

(a) 0 (b) 1

(c) 2 (d) 3

(5) $11^{th}$ term of the A.P. $-3, -\frac{1}{2}, 2, \ldots\ldots$is -

(a) 28 (b) 22

(c) $-38$ (d) $-48\frac{1}{2}$

(6) If the ratio of the sides of two similar triangles is 9:4, then what will be the ratio of the areas of the triangles?

(a) 2:3 (b) 4:9

(c) 81:16 (d) 16:81

Q.2 Fill in the blanks - [1×6=6]

(1) $3\sqrt{2}$ is a/an.....number.

(rational/irrational)

(2) The polynomial of degree one is called a.....polynomial.

(linear/quadratic)

(3) If in the equation x - 2y = k, x = 2, y = -1 then the value of k will be..... (-4 / 4)

(4) The zero of the linear polynomial ax + b is ..... $\left(-\frac{b}{a} / \frac{b}{a}\right)$

(5) If a, b, c are in A.P., the b is called the.....of a and c.

(arithmetic mean / geometric mean)

(6) Corresponding angles of similar triangles are.....

(unequal / equal)

Q.3 Match the correct column - [1×6=6]

| Column – A | Column - B |
|---|---|
| (1) HCF of 9 and 27 is | (a) equal |
| (2) Degree of cubic polynomial | (b) 9 |
| (3) In x + 2y + 3 = 0 if x = 0 then y = | (c) 27 |
| (4) Discriminant of quadratic equation $x^2 + x + 1 = 0$ | (d) 3 |
| (5) $n^{th}$ term of an A.P. | (e) $-\frac{3}{2}$ |
| (6) All the equilateral triangles are | (f) -3 |
| | (g) $a_n = a + (n-1)d$ |
| | (h) similar |

Q.4 Answer in one word / sentence - [1×6=6]

(1) If the value of the discriminant of a quadratic equation is positive, then what will be the nature of its roots?

(2) What will be the sum of 8 terms of the A.P. 5, 10, 15 .....?

(3) Will the triangle formed with sides 6 cm, 8 cm and 10 cm be a right angled triangle?

(4) Write the statement of basic proportionality theorem.

(5) What will be the coordinates of the midpoint of the line joining the points A (2, 3) and B (4, 5)?

(6) The coordinates of the vertices of a triangle are (3, 2), (1, -4) and (-4, 4), what will be the coordinates of its centroid?

Q.5 Write True / False - [1×6=6]

(1) The product of two numbers is equal to the product of their HCF and LCM. 

(2) $ax^2 + b = 0, a \neq 0$ is a quadratic equation.

(3) If two triangles are equiangular then they are similar.

(4) If the ordinate of a point is zero and the abscissa is.3 then it will lie on the x-axis.

(5) If the coordinates of a point Q are (2, 5), then 2 is called the ordinate of Q.

(6) The point (-8, 6) will lie in the second quadrant.

Q.6 Express the number 3825 as the product of its prime factors. [2]

**OR**

Explain, why 7×11×13+13 and 7×6×5×4×3×2×1+5 are composite numbers?

Q.7 Find the HCF and LCM of the numbers 6, 72 and 120 by the prime factorization method. [2]

**OR**

Consider the numbers $4^n$, where n is a natural number. Check whether there is any value of n for which $4^n$ ends with the digit zero.

Q.8 Find the zeros of the polynomial $t^2 - 15$. [2]

**OR**

If the sum of the zeroes of a quadratic polynomial is $-3$ and the product is 3, then find the polynomial.

Q.9 Find the sum of the zeros of the polynomial $x^2 + 4x + 8$. [2]

**OR**

If one of the zeros of the polynomial $(k-1)\,x^2 + kx + 1$ is $-3$, then find the value of k. 

Q.10 The cost of two kg of apples and one kg of grapes is ₹ 160. The cost of four kg of apples and two kg of grapes is ₹ 320. Construct algebraic equation. [2]

**OR**

Write an example of a pair of linear equations in two variables by which the lines represented are parallel lines.

Q.11 Check whether the equation $(2x-1)(x-3) = (x+5)(x-1)$ is a quadratic equation or not. [2]

**OR**

Express the following situation in mathematical form –

A train covers a distance of 480 km with uniform speed. Had its speed been 8 km/h less, it would have taken 3 hours more to cover the same distance. We have to find the speed of the train.

Q.12 Find the first term and common difference of the arithmetic progression $\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3}, \ldots\ldots$ [2]

**OR**

Find the sum of first 10 positive integers which are divisible by 5.

Q.13 A flower bed has 23 rose plants in the first row, 21 rose plants in the second row, 19 rose plants in the third row, and so on. There are 5 rose plants in its last row. How many rows are there in the flower bed? [2]

**OR**

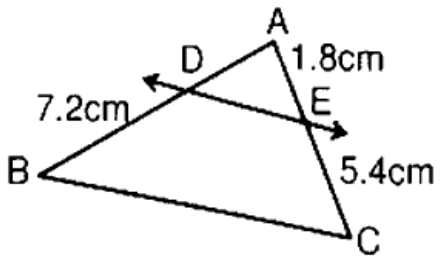
Which term of the A.P. 21, 18, 15, ..... is -81?

Q.14 For which value of n the $n^{th}$ term of both the A.P.'s 63, 65, 67, ..... and 3, 10, 17, ..... will be equal. [2]

**OR**

The $17^{th}$ term of an arithmetic progression is 7 more than its $10^{th}$ terms. Find its common difference.

Q.15 In the figure DE || BC. Find AD. [2]




**OR**

A ladder rest on a wall in such a way that its lower end is at a distance of 2.5 m from the wall and its upper end reaches a window made at a height of 6 m above the ground. Find the length of the ladder.

Q.16 In two similar triangles $\Delta ABC$ and $\Delta DEF$, if $\angle A = 47°$ , $\angle E = 83°$, then find value of $\angle C$. [2]

OR

Let $\Delta ABC \sim \Delta DEF$ and their areas are 64 $cm^2$ and 121 $cm^2$ respectively. If EF = 15.4 cm, then find the value of BC.

Q.17 Find the distance between the points (3, –2) and (–4, 1). [2]

OR

Find the centroid of the triangle whose vertices are (1, 4), (–1, –1) and (3, –2).

Q.18 Find the zeros of the quadratic polynomial $x^2 + 7x + 10$ and verify the relationship between the zeros and the coefficients. [3]

OR

If $\alpha$ and $\beta$ are the zeros of the polynomial $x^2 - x + 1$ then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.

Q.19 Solve the equation $2x^2 - 7x + 6 = 0$ by factorization method. [3]

OR

Find two consecutive positive integers whose sum of squares is 365.

Q.20 Find the relationship between x and y, so that the point (x, y) is equidistant from (3, 6) and (–3, 4). [3]

OR

If the points A(6, 1), B(8, 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram in the same order, then find the value of P.

Q.21 Prove that $5-\sqrt{3}$ is an irrational number. [4]

**OR**

Find the HCF and LCM of the numbers 26 and 91 and check that product of two numbers = HCF × LCM.

Q.22 Solve by substitution method - [4]

$x + 3y = 6$

$2x - 3y = 12$

**OR**

The difference of two numbers is 26 and one number is three times the other. Find them.

Q.23 Solve $2x + 3y = 11$ and $2x - 4y = -24$ and find m for which $y = mx + 3$? [4]

**OR**

A fraction becomes $\frac{1}{3}$ when one is subtracted from its numerator and becomes $\frac{1}{4}$ when 8 is added to the denominator. Find that fraction.