TEST PAPER-1 (REAL NUMBER, POLYNOMIALS, LINEAR EQUATIONS)

Class 10 - Mathematics

Time Allowed: 1 hour **Maximum Marks: 30**

Section A

1. The prime factorisation of the number 2304 is **[1]**

   a) $2^8 \times 3^1$ b) $2^8 \times 3^2$

   c) $2^7 \times 3^2$ d) $2^7 \times 3^3$

2. The ratio of HCF to LCM of the least composite number and the least prime number is: **[1]**

   a) 1 : 1 b) 2 : 1

   c) 1 : 2 d) 1 : 3

3. Which of the followings is an irrational number? **[1]**

   a) $(\sqrt{2}-1)^2$ b) $\left(2\sqrt{3}-\frac{1}{\sqrt{3}}\right)^2$

   c) $\frac{(\sqrt{2}+5\sqrt{2})}{\sqrt{2}}$ d) $\sqrt{2}-(2+\sqrt{2})$

4. If the sum of the zeroes of the quadratic polynomial $kx^2 + 2x + 3k$ is equal to their product, then k equals. **[1]**

   a) $\frac{1}{3}$ b) $\frac{2}{3}$

   c) $-\frac{2}{3}$ d) $-\frac{1}{3}$

5. If α, β are the zeros of the polynomial $f(x) = x^2 - p(x + 1) - c$ such that (α +1) (β + 1) = 0, then c = **[1]**

   a) −1 b) 0

   c) 1 d) 2

6. If the pair of equations 3x - y + 8 = 0 and 6x - ry + 16 = 0 represent coincident lines, then the value of **r** is: **[1]**

   a) $\frac{1}{2}$ b) $-\frac{1}{2}$

   c) 2 d) -2

7. The graphs of the equations 2x + 3y - 2 = 0 and x - 2y - 8 = 0 are two lines which are **[1]**

   a) perpendicular to each other b) parallel

   c) intersecting exactly at one point d) coincident

8. **Assertion (A):** The system of linear equations 3x + 5y - 4 = 0 and 15x + 25y - 25 = 0 is inconsistent. **[1]**

   Reason (R): The pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ is inconsistent if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$.

   a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

   c) A is true but R is false. d) A is false but R is true.

Section B

9. If 1 is a zero of the polynomial p (x) = ax^2 - 3(a - 1)x - 1 , then find the value of a. **[2]**

10. Solve the pair of equations x = 5 and y = 7 graphically. **[2]**

OR

Solve for x and y : x + y = 6, 2x - 3y = 4.

Section C

11. Prove that 3 + $\sqrt{2}$ is an irrational number, given that $\sqrt{2}$ is an irrational number. **[3]**

12. If α and β are zeroes of the quadratic polynomial $4x^2$ + 4x + 1, then form a quadratic polynomial whose zeroes are 2α and 2β. **[3]**

OR

Find a quadratic polynomial whose sum and product of the zeroes are $-2\sqrt{3}, -9$ respectively. Also find the zeroes of the polynomial by factorisation.

13. If 2 is added to the numerator of a fraction, it reduces to $\frac{1}{2}$ and if 1 is subtracted from the denominator, it reduces to $\frac{1}{3}$. Find the fraction. **[3]**

Section D

14. **Read the text carefully and answer the questions:** **[4]**

Lokesh, a production manager in Mumbai, hires a taxi everyday to go to his office. The taxi charges in Mumbai consists of a fixed charges together with the charges for the distance covered. His office is at a distance of 10 km from his home. For a distance of 10 km to his office, Lokesh paid ₹ 105. While coming back home, he took another route. He covered a distance of 15 km and the charges paid by him were ₹ 155.

(a) What are the fixed charges?

(b) What are the charges per km?

(c) If fixed charges are ₹ 20 and charges per km are ₹ 10, then how much Lokesh have to pay for travelling a distance of 10 km?

(d) Find the total amount paid by Lokesh for travelling 10 km from home to office and 25 km from office to home. [Fixed charges and charges per km are as in (i) & (ii).

Section E

15. Solve the pair of linear equations x - 2y + 4 = 0 and x + y = 2 graphically. **[5]**