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ALGEBRA
UNIT TEST

CLASS: 10   **MARKS:50**
SUB: MATHS   **TIME: 1.30 Hrs.**

I. Choose the correct answer: **7 x 1 = 7**

1. The solution of the system x+y-3z = -6, -7y+7z=7, 3z=9 is
   (A) x=1, y=2, z=3   (B) x=-1,y=2,z=3   (C) x=-1,y=-2,z=3   (D) x=1,y=-2,z=3

2. $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is   (A) $\frac{9y}{7}$ (B) $\frac{9y^3}{21y-21}$ (C) $\frac{21y^2-42y+21}{3y^3}$ (D)$\frac{7(y^2-2y+1)}{y^2}$.

3. Which of the following should be added to make x^2+64 a perfect square?
   (A) $4x^2$ `(B) $16x^2$ (C) $8x^2$ (D) $-8x^2$.The square

4. The values of a and b if $4x^4-24x^3+76x^2+ax+b$ is a perfect square are
   (A) 100, 120   (B) 10,12   (C)-120,100   (D) 12,10

5. Graph of a linear equation is a
   (A) Straight line   (B) circle   (C) parabola   (D) hyperbola

6. The solution of $(2x-1)^2 = 9$ is equal to
   (B) -1   (B) 2   (C) -1,2   (D) None of these

7. $\frac{x}{x^2-25} - \frac{8}{x^2+6x+5}$ gives
   (A) $\frac{x^2-7x+40}{(x-5)(x+5)}$ (B) $\frac{x^2-7x+40}{(x-5)(x+5)(x+1)}$ (C) $\frac{x^2-7x+40}{(x^2-25)(x+1)}$ (D) $\frac{x^2+10}{(x^2-25)(x+1)}$.

II. Answer any FIVE questions: (Q.No.14 is compulsory)   **5 x 2 = 10**

8. Find the excluded values, if any of the following expressions: $\frac{y}{y^2-25}$.

9. Simplify: $\frac{4x^2y}{2x^2} \times \frac{6xz^3}{20y^4}$

10. Find the square root of the following expression: $\frac{144a^8b^{12}c^{16}}{81f^{12}g^4h^{14}}$.

11. Find the sum and product of the roots for each of the following quadratic equations: (i) $x^2+8x-65 = 0$
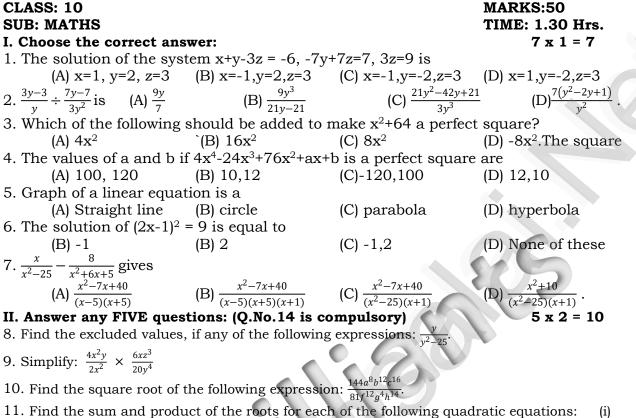
12. Solve the following quadratic equation by factorization method: $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

13. Determine the nature of roots for the following quadratic equation: $9x^2 - 24x+16 = 0$

14. If α, β are the roots of the equation $3x^2+7x-2 = 0$, find the value of $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$

III. Answer any FIVE questions: (Q.No.21 is compulsory)   **5 x 5 = 25**

15. The sum of thrice the first number, second number and twice the third number is 5. If thrice the second number is subtracted from the sum of first number and thrice the third number we get 2. If the third number is subtracted from the sum of twice the first, thrice the second, we get 1. Find the numbers.

16. Find the LCM and GCD for the following and verify that f(x) x g(x) = LCM x GCD.
    $(x^3-1)(x+1), (x^3+1)$

17. Simplify: $\frac{1}{x^2-5x+6} + \frac{1}{x^2-3x+2} - \frac{1}{x^2-8x+15}$.

18. A bus covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hr more it would have taken 30 minutes less for the journey. Find the original speed of the bus.

19. If the roots of the equation $(c^2-ab)x^2-2(a^2-bc)x+b^2-ac = 0$ are real and equal prove that either a = 0 (or) $a^3+b^3+c^3 = 3abc$.

20. If α and β are the roots of $7x^2+ax+2 = 0$ and if $\beta - \alpha =-\frac{13}{7}$. Find the value of α.

21. Find the square root of $64x^4-16x^3+17x^2-2x+1$.

IV. Answer all the question: **1 x 8 = 8**

22. Draw a circle of diameter 6 cm from a point P, which is 8 cm away from its centre. Draw the two tangents PA and PB to the circle and measure their lengths.   (OR)
Varshika drew 6 circles with different sizes. Draw a graph for the relationship between the diameter and circumference of each circle a shown in the table and use it to find the circumference of a circle when its diameter is 6 cm.

Diameter (x) cm	1	2	3	4	5
Circumference (y) cm	3.1	6.2	9.3	12.4	15.5

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