Plk brilliants

ALGEBRA
UNIT TEST

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

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

1. A system of three linear questions in three variables is inconsistent if their planes
   (A) Intersect only at a point (B) intersect in a line
   (C) coincides with each other (D) do not intersect
2. If (x-6 is the HCF of x^2-2x-24 and x^2-kx-6 then the value of k is
   (A) 3 (B) 5 (C) 6 (D) 8
3. $y^2 + \frac{1}{y^2}$ is not equal to
   (A) $\frac{y^4+1}{y^2}$ (B) $\left(y+\frac{1}{y}\right)^2$ (C) $\left(y-\frac{1}{y}\right)^2+2$ (D) $\left(y+\frac{1}{y}\right)^2-2$.
4. The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to
   (A) $\frac{16}{5}\left\lvert\frac{x^2y^4}{y^2}\right\rvert$ (B) $16\left\lvert\frac{y^2}{x^2z^4}\right\rvert$ (C) $\frac{16}{5}\left\lvert\frac{y}{xz^2}\right\rvert$ (D) $\frac{16}{5}\left\lvert\frac{xz^2}{y}\right\rvert$.
5. The solution of $(2x-1)^2 = 9$ is equal to
   (A) -1 (B) 2 (C) -1,2 (D) None of these
6. The number of points of intersection of the quadratic polynomial x^2+4x+4 with the X axis is (A) 0 (B) 1 (C) 0 (D) 2
7. If the roots of the equation $q^2x^2+p^2x+r^2=0$ are the squares of the roots of the equation $qx^2+px+r=0$, then q,p,r are in ------
   (A) A.P. (B) G.P. (C) both A.P and G.P (D) None of these

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

8. Find the LCM of the given expression: $p^2 - 3p + 2$, $p^2 - 4$
9. Reduce the rational expression to its lowest form $\frac{x^2-16}{x^2+8x+16}$.
10. Find the excluded values of the following expressions (if any): $\frac{7p+2}{8p^2+13p+5}$.
11. Simplify: $\frac{4x}{x^2-1}-\frac{x+1}{x-1}$.
12. Find the values of 'k' for which the quadratic equation kx^2-(8k+4)x+81 = 0 has real and equal roots?
13. If the difference between the roots of the equation x^2-13x+k = 0 is 17 find 'k'.
14. Write down the quadratic equation in general form for which sum and product of the roots are given below: 9, 14

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

15. Solve the following system of linear equations in three variables:
    x + y + z = 5; 2x - y + z = 9; x - 2y + 3z = 16
16. Find the GCD of the given polynomials:$3x^4 + 6x^3 -12x^2 - 24x$, $4x^4 + 14x^3 + 8x^2 - 8x$
17. If $A = \frac{2x+1}{2x-1}$, $B = \frac{2x-1}{2x+1}$ find $\frac{1}{A-B}-\frac{2B}{A^2-B^2}$.
18. Find the values of m and n if the following polynomials are perfect squares:
    $36x^4$-$60x^3$+$61x^2$-mx+n
19. A passenger train takes 1 hr more than as express train to travel a distance of 240km from Chennai to Virudhachalam. The speed of the express train is more than that of the passenger train by 20 km per hour. Find the average speed of both the train?
20. Prove that the equation $x^2(p^2+q^2) + 2x(pr+qs) + r^2+s^2 = 0$ has no real roots. If ps = qr, then show that the roots are real and equal.
21. If α and β are the roots of x^2+7x+10 = 0 find the value of (i)$\alpha - \beta$ (ii)$\alpha^2 + \beta^2$ (iii) $\alpha^3 - \beta^3$

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

22. Draw a circle of radius 4 cm. At a point L on it draw a tangent to the circle using alternate segment. (OR)

Graph the following linear function $y = \frac{1}{2}x$. Identify the constant of variation and verify it with the graph. Also (i) find y when x = 9 (ii) find x when y = 7.5.