

BANGABASI COLLEGE

Dept. of Mathematics

First year Assignment(Classical Algebra)

Full Marks-25—Time-40 min

Answer the following questions:(any five)

1. Find the values of k for which the equation $x^4 + 4x^3 - 2x^2 - 12x + k = 0$ has four real and unequal roots.
2. Find the number of real roots of the equation $x^4 + 4x^3 - x^2 - 2x - 5 = 0$.
3. If α, β, γ be the roots of the equation $x^3 + px^2 + qx + r = 0$, find the value of (i) $\sum \alpha^2 \beta^2 \gamma$ and $\sum (\alpha - \beta)^2 \gamma$.
4. If α, β, γ be the roots of the equation $x^3 + qx + r = 0 (r \neq 0)$, find the equation whose roots are $\frac{\beta}{\gamma} + \frac{\gamma}{\beta}, \frac{\gamma}{\alpha} + \frac{\alpha}{\gamma}, \frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.
5. Solve the equations by Ferrari's method $x^4 - 2x^2 + 8x - 3 = 0$.
6. Solve by Cardan's method $x^3 - 12x + 8 = 0$.

