PART – A

Answer all the questions (10 X 2 = 20)

1. Write down the nth derivative of *cos25x*.
2. Show that for *y2=4ax*, the subnormal at any point is a constant.
3. Give the formula for the radius of curvature in Cartesian form.
4. Define evolute.
5. If α, β , γ are the roots of *x3+px2+qx+r=0* find the value of **.**
6. Give the number of positive roots of *x3+2x+3=0*.
7. Show that *sin ix =i sinh x*.
8. Evaluate 
9. Find the polar of *(3, 4)* with respect to *y2 = 4ax*.
10. Define an asymptote of a hyperbola.

PART – B

Answer any FIVE questions. (5 X 8 = 40)

1. Show that in the curve *by2=(x+a)3* the square of the subtangent varies as the subnormal .
2. Find the radius of curvature at ‘θ’ on *x = a(cos* θ*+* θ *sin* θ*), y=a(sin* θ *–* θ *cos* θ*).*
3. Find the p-r equation of *r sin* θ *+ a = 0*.
4. Solve: *x4+2x3-5x2+6x+2=0* given that *(1+i)* is a root.
5. Remove the second term from the equation *x3-6x2+11x-6=0*.
6. Separate into real and imaginary parts *tanh (x+iy)*.
7. Find the locus of poles with respect to *y2=4ax* of tangents to *x2+y2=c2*.
8. Derive the polar equation*=1 + e cos* θ of a conic.

PART –C

Answer any TWO questions. 2 X 20 = 40

1. a) If ****, show that ***(1-x2)yn+2 - (2n+1)xyn+1 - (n2+a2)yn=0***.

b) Find the slope of *=cos(*θ*-α) + ecos* θ. (12 + 8)

 20. a) Show that the radius of curvature at any point on r = aeθ cot α is r cosec α.

 b) Solve *6x5-x4-43x3+43x2+x-6 = 0.* (10 +10)

 21. a) Calculate to two places of decimals, the positive root of x3+6x-2 = 0 by Horner’s method.

 b) Expand *cosh*8θ in terms of hyperbolic cosines of multiples of θ. (12 + 8)

 22. a) Sum of infinity : …

 b) If e and e1 are two extremities of hyperbola and its conjugate show that 

 (10 +10)