Assignment-1 Part2

ee24btech11064 - Harshil Rathan

1. The maximum distance from origin of a point on the curve
   x = a sin(t-b) sin($\frac{at}{b}$)
   y = a cos(t-b) cos($\frac{at}{b}$), both a, b > 0 [2002]
   a) a-b
   b) a+b
   c) $\sqrt{a^2+b^2}$
   d) $\sqrt{a^2-b^2}$

2. If 2a+3b+6c=0, (a,b,c ∈ R) then the quadratic equation ax^2+bx+c has [2002]
   a) at least one root in [0,1]
   b) at least one root in [2,3]
   c) at least one root in [4,5]
   d) none of these

3. If the function $f(x) = 2x^3 - 9ax^2 + 12a^2x + 1$, where a >0, attains its maximum and minimum at p and q respectively such that $p^2 = q$, then a equals [2003]
   a) $\frac{1}{2}$
   b) 3
   c) 1
   d) 2

4. A point on the parabola $y^2 = 18x$ at which the ordinate increases at twice the rate of the abscissa is [2004]
   a) $(\frac{9}{8}, \frac{9}{2})$
   b) $(2, -4)$
   c) $(\frac{-9}{8}, \frac{9}{2})$
   d) $(2, 4)$

5. A function y=$f(x)$ has a second order derivative f"$(x) = 6(x-1)$.If its graph passes through the point (2,1) and at that point the tangent to the graph y=3x-5, then the function is [2004]
   a) $(x+1)^2$
   b) $(x-1)^3$
   c) $(x+1)^3$
   d) $(x-1)^2$

6. The normal to the curve x=a(1+cosθ), y=a$sin\theta$ at θ always passes through the fixed point [2004]
   a) (a,a)
   b) (0,a)
   c) (0,0)
   d) (a,0)

7. If 2a+3b+6c=0, then atleast one root of the equation ax^2+bx+clies in the interval [2004]
   a) (1,3)
   b) (1,2)
   c) (2,3)—
   d) (0,1)

8. Area of the greatest rectangle that can be inscribed in the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$is
   a) 2ab
   b) ab
   c) $\sqrt{ab}$
   d) $\frac{a}{b}$

9. The normal to the curve $x = a\cos\theta + \sin\theta$, y=$a\sin\theta - \cos\theta$)at any point $\theta$is such that
   a) it passes through the origin
   b) it makes an angle $\frac{\pi}{2}+\theta$ with the x axis
   c) it passes through $(a\frac{\pi}{2}, -a)$
   d) it is at a constant distance from the origin