Section – A (1 Mark Each) (5 Marks)

Q. 1. The equation of tangent to the curve $y = 4xe^x$ at $\left(-1, \dfrac{-4}{e}\right)$ is

(a) $x = 0$ 　　　　(b) $y = 0$ 　　　　(c) $x = \dfrac{-4}{e}$ 　　　　(d) $y = \dfrac{-4}{e}$

Q. 2. The function $f(x) = 2 - 3x + 3x^2 - x^3$, $x \in R$ is

(a) neither increasing nor decreasing 　　　　(b) increasing

(c) Decreasing 　　　　(d) none

Q. 3. The approximate value of $\sqrt{8.95}$ is

(a) 2.9916 　　　　(b) 2.9917 　　　　(c) 2.9619 　　　　(d) 2.1969

Q. 4. At $x = 1$, the angle between the tangents to the curve $x^2 = 2y$ & $6y = 5 - 2x^3$ is

(a) 0º 　　　　(b) 45º 　　　　(c) 90º 　　　　(d) 60º

Q. 5. The approximate value of tan44º, if 1º = 0.0175 is

(a) 0.09825 　　　　(b) 0.9825 　　　　(c) 0.0965 　　　　(d) 0.965

Section – B (3 Marks Each) (12 Marks)

Q. 6. The radius of a circle is increasing at the rate of 0.5 cm/sec. Find the rate of increase of it circumference if radius is 4 cm.

Q. 7. Show that $f(x) = e^x$ is increasing on R.

Q. 8. Find hte equationi of normal at the point (am^2, am^3) for the curve $ay^2 = x^3$.

Q. 9. Find the intervals in which the function f is given by

$f(x) = \sin x + \cos x$, $0 \le x \le 2\pi$ is strictly increasing or strictly decreasing.

OR

The volume of a cube is increasing at the rate of 8 cm³/sec. How fast is the surface area increasing when the length of an edge is 12 cm.

Section – C (4 Marks Each) (8 Marks)

Q. 10. Find the maximum volume of right circular cylinder it the sum of its radius and height is 6 cm.

Q. 11. Find the maximum and minimum values if any, of the functions, $f(x) = x^3 + 1$

OR

A car starts from point P at tune 't' = 0 seconds and stops of point Q. The distance x in mettres covered at t seconds is given by

$x = t^2\left(2 - \dfrac{t}{3}\right)$. Find the tune taken by it to reach Q and also distance between P & Q.