



# SHIKSHA CLASSES

Subject : Maths- II

**BOARD QUESTION PAPER**

Total Marks : 20

Class : XII

Topic: 2. Application of Derivative

Time : 1 Hr.

## Section A

**Q.1 : Choose the correct option :** 4

- i) A rectangle has an area 25 sq. cm. If its perimeter is least its dimensions are  
a) 5,5                      b) 8, 2                      c) 6, 4                      d) none
- ii) The volume of a ball is increasing at the rate of  $4\pi cm^3 / sec$  Find rate of increase of the radius when the volume is  $288\pi cm^3$   
a)  $\frac{1}{6} cm / sec$               b)  $\frac{1}{36} cm / sec$               c)  $\frac{1}{26} cm / sec$               d)  $6 cm / sec$

**Q.2 : Solve the following questions:** 2

- i) Show that the function  $f(x) = x^3 + 10x + 7$  for  $x \in R$  is strictly increasing.
- ii) Find the value of  $x$  for which the function  $f(x) = x^3 + 12x^2 + 36x + 6$  is monotonically decreasing.

## Section B

**: Solve the following : (ANY2)** 4

**Q.3 :** Find the local maximum and local minimum value of  $f(x) = x^3 - 3x^2 - 24x + 5$ .

**Q.4 :** A wire of length 36 meters is bent in the form of a rectangle. Find its dimensions if the area of the rectangle is maximum.

**Q.5 :** Find the equation of tangent to the curve  $2x^2 + 3y^2 - 5 = 0$  at (1,1)

## Section C

**: Answer the following : (ANY 2)** 6

**Q.6 :** Divide the number 70 in two parts so that their product is maximum.

**Q.7 :** Determine the maximum and minimum value of  $f(x) = 2x^3 - 21x^2 + 36x - 20$

**Q.8 :** The radius of a circle is increasing at the rate of 2 cm/sec. Find the rate at which the area of the circle is increasing, when the radius is 5 cm.

## Section D

**: Answer the following : (ANY 1)** 4

**Q.9 :** An inverted cone of 10m height and 5m base radius is filled with water. Its volume increase at

the rate of  $\frac{3}{2} \text{ cm}^3 / \text{min}$ . find the rate of which the height of the water level increases when the depth 4m.

**Q.10:** A stone, vertically thrown upwards is moving in a live. Its equation of motion is  $S = 294t - 49t^2$  then find the maximum height that the stone reaches.

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