**ASSIGNMENT NO.- 5[Ch-6 (Applications of Derivatives)]**

**Class -XII**

1. The volume of a cube is increasing at the rate of 9 cm3/sec.How fast is the surface area

 increasing,when the length of an edge is 10 cm ?

2. Find the interval for which function $f\left(x\right)=(x+1)^{3}(x-3)^{3}$ is strictly increasin or decreasing.

3. Find the intervals in which the function $f$ given by $f\left(x\right)=2x^{3}-3x^{2}-36x+7$ is

 (a) strictly increasing (b) strictly decreasing

4. Find the angle of intersection of curves $y=4-x^{2}$ and $y=x^{2}.$

5. Find the approximate value of $f\left(2.01\right),$where $f\left(x\right)=x^{3}-4x+7.$

6. Find the approximate value of $(26.57)^{\frac{1}{3}}$.

7. Find the values of $x$ for which the function $x^{4}-8x^{3}+22x^{2}-24x+5$ attains maximum or

 minimum.

8. Show that the right circular cone of least curved surface area and given volume has an altitude

 equal to $\sqrt{2}$ times the radius of the base.

9. Show that the semi-vertical angle of the cone of the maximum volume and of given slant height

 is $cos^{-1}\frac{1}{\sqrt{3}}$.

10. Show that the right circular cylinder of given surface area and maximum volume is such that its

 height is equal to the diameter of the base.

11. Show that the volume of the largest cone that can be inscribed in a sphere of radius $R$ is $\frac{8}{27}$ of

 the volume of the sphere.

12. Prove that the rectangle of maximum area inscribed in a circle ,is a square.

13. Find all the points of local maxima and local minima of the function

 $f\left(x\right)=\frac{-3}{4}x^{4}-8x^{3}-\frac{45}{2}x^{2}+105$

14. An open topped box is to be constructed by removing equal squares from each corner of a 3

 metre by 8 metre rectangular sheet of aluminium and folding up the sides.Find the volume of

 the largest such box.