CHOITHRAM SCHOOL MANIKBAGH INDORE
CLASS XII Session: 2018-19

Subject: Mathematics **Assignment No: 3**
Allotment Date: 17/08/18 **Submission Date: 22/08/18**

S.No	QUESTION	MARKS	LEVEL
	VERY SHORT ANSWER TYPE		
1	Find the rate of change of the area of a circle with respect to its radius r when $r = 3$ cm	1 mark	Knowledge
2	The radius of a circle is increasing uniformly at the rate of 3 cm/s. Find the rate at which the area of the circle is increasing when the radius is 10 cm.	1 mark	Understanding
3	Show that the function given by $f(x) = 3x + 17$ is strictly increasing on **R**.	1 mark	H.O.T.
	SHORT ANSWER TYPE I		
4	Find points at which the tangent to the curve $y = 2x^3 - 15x^2 + 36x - 21$ is parallel to the x-axis.	2 Marks	Knowledge
5	The length x of a rectangle is decreasing at the rate of 5 cm/minute and the width y is increasing at the rate of 4 cm/minute. When $x = 8$ cm and $y = 6$ cm, find the rates of change of (a) the perimeter, and (b) the area of the rectangle.	2 Marks	Understanding
6	Find equation of tangent and normal to the curve $x = 1 - \cos\theta$; $y = \theta - \sin\theta$ at $\theta = \frac{\pi}{4}$	2 Marks	logic
7	A ladder 5 m long is leaning against a wall. The bottom of the ladder is pulled along the ground, away from the wall, at the rate of 2 cm/s. How fast is its height on the wall decreasing when the foot of the ladder is 4 m away from the wall?	2 Marks	H.O.T.
	SHORT ANSWER TYPE II		
8	Find the intervals in which the function $f(x) = -x^3 + 6x^2 - 9x + 20$ is: 1) Strictly increasing 2) Strictly decreasing.	3 Marks	Understanding
9	If the radius of a sphere is measured as 9 m with an error of 0.03 m, then find the approximate error in calculating in surface area.	3 Marks	Understanding
10	Show that the right circular cylinder of given surface and maximum volume is such that is heights is equal to the diameter of the base.	3 Marks	Multi concept
	LONG ANSWER TYPE		
11	If the sum of the lengths of the hypotenuse and a side of a right angle triangle is given, show that the area of the triangle is maximum when the angle between them is $\frac{\pi}{3}$.	5 Marks	H.O.T.
12	Show that height of the cylinder of greatest volume which can be inscribed in a right circular cone of height h and semi vertical angle α is one-third that of the cone and the greatest volume of cylinder is $\frac{4}{27}\pi h^3 \tan^2\alpha$	5 Marks	Logic