

CHOITHRAM SCHOOL MANIKBAGH INDORE**CLASS XII Session: 2017-18****Subject: MATHEMATICS**
Allotment Date: 18/08/17**Assignment No: 3**
Submission Date: 23/08/17

| 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 \mathbf{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 strictly increasing and 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 | value |
| 10 | Show that the right circular cylinder of given surface and maximum volume is such that its 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 |