CHAPTER-5[APPLICATION OF DERIVATIVES]

INCREASING& DECREASING:

1. The value(s)of x for which the function $y = x^4 - \frac{4x^3}{3}$ is increasing is

   (a)$(-1, \infty)$ (b)$(1, \infty)$ (c)(0, 1)   (d)$(-1, 0)$

2. The nature of the function $y = \frac{4x^2+1}{x}$,$x \neq 0$ in the interval $\left(\frac{-1}{2}, 0\right)$

   (a)increasing   (b)strictly increasing

   (c)decreasing   (d)strictly decreasing

3. The interval in which the function $f(x) = x^3 - 6x^2 + 9x + 15$ is decreasing

   (a)$(-1, 3)$ (b) $(1, 3)$ (c) $(-\infty, -1)$ (d) $(-\infty, 3)$

4. Critical point for the function $f(x) = \frac{1}{4}x^4 - x^3 - 5x^2 + 24x + 12$, in the domain $[0, 3]$

   (a)3   (b)-3(c)2   (d)4

5. Find the intervals for the following function is increasing and decreasing

   (i)$f(x) = (x - 1)(x - 2)^2$

   (ii) $f(x) = 6 - 9x - x^2$

   (iii) $f(x) = x^4 - 8x^3 + 22x^2 - 24x + 21$

ANSWERS
1. (b) $(1, \infty)$
2. (d)strictly decreasing
3. $(b)(1, 3)$
4. (c)2
5. $(i) \left(-\infty, \frac{4}{3}\right] \cup [2, \infty) \uparrow$ and $[\frac{4}{3}, 2] \downarrow$ $(ii) \left(-\infty, \frac{-9}{2}\right) \uparrow$ and $\left(-\frac{9}{2}, \infty\right) \downarrow$
   $(iii)[1, 2] \cup [3, \infty) \uparrow$