XI | WORKSHEET NO: 7

A.O.D. (Local Max / local Min)

Q.No 1 find the absolute Maximum and Absolute Minimum value of function

$f(x) = \cos^2 x + \sin x \; ; \quad x \in [0, \pi]$

Ans Max = 5/4 ; Min = 1

Q.N. 2 → Find the points at which the function $f(x) = (x-2)^4 (x+1)^5$ has local maxima, local minimon & point of Inflexion

Ans Max at $x = 2/7$; Min at $x = 2$; point of Inflexion at $x = 1$

Q.N. 3 → Find the points of local maxima, point of local Minima, local Max. valu & local min value of following function

(1) $f(x) = \frac{x}{2} + \frac{2}{x} \; ; \; x > 0$

(2) $f(x) = x\sqrt{1-x} \; ; \; x > 0$

(3) $f(x) = \sin x + \frac{1}{2}\cos(2x) \; ; \quad 0 \le x \le \pi/2$

(4) $f(x) = 2\sin x - x \; ; \quad -\frac{\pi}{2} \le x \le \frac{\pi}{2}$

(5) $f(x) = \sin^4 x + \cos^4 x \; ; \quad 0 < x < \frac{\pi}{2}$

Ans

(1) local Minimum value = 2 at $x = 2$

local Max. value = $1/2$ at $x = 0$

(2) local Maximum value = $\frac{2\sqrt{3}}{9}$ at $x = 2/3$

NO local Minimum value

(3) local Max value = $\frac{3}{4}$ at $x = \pi/6$

local Min value = $1/2$ at $x = \pi/2$

(4) local Max value = $\sqrt{3} - \pi/3$ at $x = \pi/3$

local Min value = $-\sqrt{3} + \pi/3$ at $x = -\pi/3$

(5) local Min value = $1/2$ at $x = \pi/4$

NO local Max value

Qn. 4 → Find the absolute Max & absolute Min value of (1) $f(x) = 3x^4 - 8x^3 + 12x^2 - 48x + 1$ on $[1, 4)$

Ans Abs. Max value = 257

Abs- Min value = -59

(2) $f(x) = (x-2)\sqrt{x-1}$; $x \in [1, 9]$

Ans Abs. Max value = 14

Abs Min value = $\frac{-3}{4^{4/3}}$

— x —