St. ID - 19101573

Name - Zuhair Hossain

Sec - 03

Q4)

1)

Here,

$x_0 = 0 \quad ; \quad f(x_0) = 1$

$x_1 = 0.6 \quad ; \quad f(x_1) = 1.8221$

$\therefore \quad a_0 + a_1 x_0 = 1$

$\Rightarrow \quad a_0 + a_1 \times 0 = 1$

$\Rightarrow \quad a_0 = 1 \quad \text{---} \quad (i)$

Again,

$a_0 + a_1 x_1 = 1.8221$

$\Rightarrow \quad a_0 + a_1 \times 0.6 = 1.8221$

$\Rightarrow \quad a_0 + 0.6\, a_1 = 1.8221 \quad \text{---} \quad (ii)$

~~$\therefore P_1(x) = a_0 + a_1 x$~~

$\Rightarrow \quad 1 + 0.6\, a_1 = 1.8221$

$\Rightarrow \quad a_1 = 1.3701666$

$$\therefore P_1(x) = a_0 + a_1 x$$

$$= 1 + 1.37x$$

2]

$$P_1(x) = 1 + 1.3x$$

$$\therefore P_1(0.75) = 1 + 1.3(0.75)$$

$$= \cancel{1.975}\ 2.0275$$

3]

if $f(x) = e^x$;

then,

$$|f(x) - P_1(x)| = \cancel{0.75} \text{ at } x = 0.75$$

$$\therefore \Rightarrow e^x - (a_0 + a_1 x)$$

$$\Rightarrow e^{0.75} - \{1 + (1.37 \times 0.75)\}$$

$$= 0.0895$$

4)

According to Weierstrass theorem, ~~we~~ if would like to reduce ~~the~~ error we should ~~choo~~ consider more nodes in the previous part.