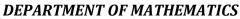


(An Autonomous Institution)



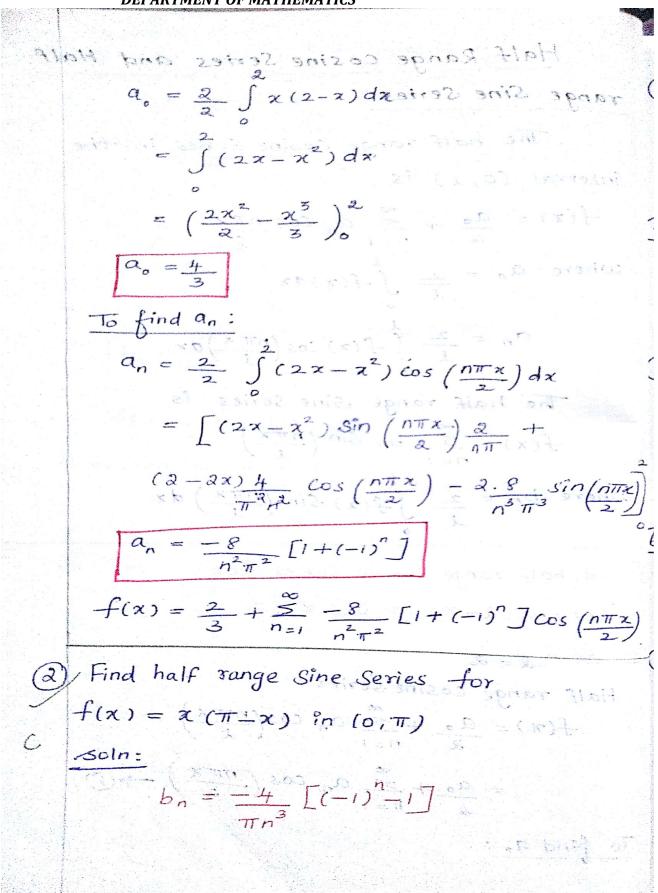


Half Range Cosine Series and Half range Sine Series The half range cosine series in the interval (0,1) is  $f(x) = \frac{a_0}{2} + \frac{s_0}{2} a_n \cos \frac{n\pi x}{2}$ where  $a_0 = \frac{2}{l} \int f(x) dx$  $a_n = \frac{2}{l} \int f(x) \cos\left(\frac{n\pi x}{l}\right) dx$ The half range Sine Series is  $f(x) = \sum_{n=1}^{\infty} b_n \sin\left(\frac{n\pi x}{\ell}\right)$ where  $b_n = \frac{2}{p} \int f(x) \sin\left(\frac{n\pi x}{2}\right) dx$ D) Find half range cosine Series for  $f(x) = x(a - x) in \quad 0 \le x \le 2 = (x)^{2}$ soln: l=2 Half range cosine series spor flad buil (2)  $f(\pi) = \frac{a_0}{2} + \frac{s}{n-1} a_n \cos\left(\frac{n\pi x}{k}\right) = \infty$  $= \frac{a_0}{a} + \frac{z}{n=1} a_n \cos\left(\frac{n\pi x}{2}\right) \longrightarrow (1)$ To find a. :



(An Autonomous Institution) DEPARTMENT OF MATHEMATICS





FOURIER SERIES



(An Autonomous Institution) DEPARTMENT OF MATHEMATICS



(3) Find half trange Casine series for 
$$f(x) = 1 - x$$
  
in  $(0, 1)$ . The LANN  $2MR = 1$   
is  $(0, 1)$ . The LANN  $2MR = 1$   
is  $(0, 1)$ . The LANN  $2MR = 1$   
is  $a_0 = 1$ ,  $a_n = \frac{24}{n^2 \pi^2} \left[ 1 - (-1)^n \right]$   
(4) Find half range Cosine series for  $f(x) = x \sin x$   
in  $(0, \pi)$ .  
Sola:  
 $a_0 = 2$ ,  $a_n = \frac{-2(-1)^n}{n^2 - 1}$ ,  $a_1 = \frac{-1}{4}$ .  
(5) Find half range Fourier Sine Series for  
 $f(x) = \int x$ ,  $0 \le x \le \frac{1}{2}$   
 $(-1)^n = \frac{4}{n^2 \pi^2} Sin(\frac{n\pi}{2})$   
 $b_n = \frac{4}{n^2 \pi^2} Sin(\frac{n\pi}{2})$   
(6) Find half range Sine Series for  $f(x) = 1 - x$  in  
 $(0, 1)$ .  
Sola:  $b_n = \frac{-2}{n\pi}$   
(7) Find the half range Sine Series for  $f(x) = x$  in  
 $0 \le x < 1$  and  
Sola:  $b_n = \frac{-2}{n\pi}$ 





(An Autonomous Institution) DEPARTMENT OF MATHEMATICS

Root MEAN SQUARE VALUE  
IRMS VALUE]  
The root mean soluare value or RMS  
Value of f(x) over the interval (a,b)  
is defined as  

$$MS = \int \frac{d}{dt} (f(x))^{2} dx$$
(To c) a  
(To