Parul University
Faculty of Engineering & Technology
Department of Applied Sciences and Humanities
1st Year B. Tech Programme (All Branches)
Mathematics– 1 (303191101)
Assignment-2

1)	Find the Fourier series for the function $\frac{(\pi - x)^2}{4}$; $0 < x < 2\pi$.
2)	Find Fourier Series of the half-wave rectifier is defined in the period 2π and is given as, $$f(x) = \begin{cases} I_0 Sinx; & 0 \le x \le \pi \\ 0; & \pi \le x \le 2\pi \end{cases}$$
3)	Find the Fourier series on $-\pi \le x \le \pi$ for, $f(x) = \lvert sin\, x \rvert$, an even function.
4)	Find Fourier series expansion of the function f(x) = 4-3x for the limits [– 1, 1].
5)	Find the expansion of the function $1 - \frac{x}{\pi}$ For the limits [– π, π].
6)	Find the Fourier series for the function f(x) = $x - x^2$ in the interval $(-\pi, \pi)$. Hence, deduce that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} \ldots \ldots = \frac{\pi^2}{12}$
7)	Find Fourier series expansion of, $$f(x) = \begin{cases} 1 + \frac{2x}{\pi}; & -\pi \le x \le 0 \\ 1 - \frac{2x}{\pi}; & 0 \le x \le \pi \end{cases}$$
8)	Obtain the Fourier cosine series of the function $$F(x) = \begin{cases} x^2; & 0 \le x \le 2 \\ 4; & 2 \le x \le 4 \end{cases}$$
9)	Find the half-range sine series for the function, $$f(x) = \begin{cases} \left(\frac{1}{4} - x\right), & 0 < x < \frac{1}{2} \\ \left(x - \frac{3}{4}\right), & \frac{1}{2} < x < 1 \end{cases}$$
10)	a) Form the differential equation by eliminating arbitrary constants from $\log\left(\frac{y}{x}\right) = cx$ b) From the differential equation by eliminating arbitrary constants from $y = Ae^{-3x} + Be^{2x}$.