SRM Institute of Science and Technology
DEPARTMENT OF MATHEMATICS
18MAB201T: Transforms and Boundary Value Problems
ACADEMIC YEAR 2021-2022 (ODD)
Tutorial-3 (Unit-2)

1. Define Root Mean Square and find the R.M.S. value of $f(x) = 1 - x$ in $(0, 1)$.
2. State the Parseval's theorem for full range series, half range sine and half range cosine series.
3. Find the R.M.S value of $f(x) = x - x^2$ in $-1 < x < 1$.
4. Find the R.M.S value of $f(x) = x^2$ in $-\pi < x < \pi$.
5. Find the half range sine series of $f(x) = x$ in $(0, \pi)$.
6. Find the half range cosine series of $f(x) = x(\pi - x)$ in $0 < x < \pi$.
7. Find the first three harmonics in the Fourier series of period 8 for the function $y = f(x)$ which is defined by means of the following table.

x:	1	2	3	4	5	6	7	8
y:	365	337	205	80	56	93	184	298

8. Find the Fourier series of $y = f(x)$ in $(0, 2\pi)$ up to the third harmonic, using the definition of y given by the following table.

x:	0	$\pi/3$	$2\pi/3$	π	$4\pi/3$	$5\pi/3$	2π
y:	1.98	1.30	1.05	1.30	-0.88	-0.25	1.98

9. Find the constant term and the first three harmonics in the Fourier cosine series of $y = f(x)$ in $(0, \pi)$ using the following table.

x:	0	$\pi/6$	$\pi/3$	$\pi/2$	$2\pi/3$	$5\pi/6$
y:	10	12	15	20	17	11

10. Find the first three harmonics in the Fourier sine series of $y = f(x)$ in $(0, 180^\circ)$ using the following table.

x° :	0	15	30	45	60	75	90	105	120	135	150	165	180
y:	0	2.7	5.2	7.0	8.1	8.3	7.9	6.8	5.5	4.1	2.6	1.2	0