Total No. of Questions: 3

Enrollment No.....

Faculty of Engineering

Mid Sem I Examination March - 2023

EN3BS12 Engineering Mathematics- II (Physics Group)

Programme: B.Tech. Branch/Specialisation: All

Duration: 1.5 Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	Laplace transformation of t^3 is given by a) $\frac{1}{s^4}$ b) $\frac{6}{s^4}$ c) $\frac{6}{(s-2)^4}$ d) None of these	1	BL01	CO1	PO1	
	ii.	Value of $L^{-1}\{\frac{1}{s^2-4}\}$ is a) sin2t b)2sin2t c)$\frac{1}{2}$sin2t d) None of these	1	BL01	CO1	PO1	
	iii.	Laplace transformation of f(t)=sinh2t, is a) $\frac{2}{s(s^2+4)}$ b) $\frac{2}{s(s^2-4)}$ c) $\frac{1}{(s^2-4)}$ d) None of these	1	BL01	CO1	PO1	
	iv.	Which of the following is a period of $tanx$ function a)π b)2π c)3π d) None of these	1	BL01	CO1	PO1	
	v.	Which of the following is correct a) $\int_{-\pi}^{\pi} sinmt = 0$ b) $\int_{-\pi}^{\pi} sinmt = \pi$ c) $\int_{-\pi}^{\pi} sinmt = m\pi cosmt$ d) none of these	1	BL01	CO1	PO1	
	vi.	Let f(x) be a periodic function with period	1	BL01	CO1	PO1	

2π defined in the interval $(c, c+2l)$ then $\frac{1}{2\pi}\int_c^{c+2l}[f(x)]^2\,dx$ equal to

a) $\frac{a_0}{4}+\frac{1}{2}\sum_{n=1}^{\infty}(a_n{}^2+b_n{}^2)$

b) $\frac{a_0}{4}+\frac{1}{2}\sum_{n=1}^{\infty}(a_n{}^2 b_n{}^2)$

c) $\frac{a_0{}^2}{4}+\frac{1}{2}\sum_{n=1}^{\infty}(a_n{}^2+b_n{}^2)$

d) None of these

2	i.	State and prove first shifting theorem of Laplace transformation	2	BL02	CO1 PO2
	ii.	Evaluate $L^{-1}\{\frac{s}{(s+1)^5}\}$	2	BL04	CO1 PO2
	iii.	Express the following function in terms of unit step functions	3	BL02	CO1 PO2
		a) $f(x)=\begin{cases} sint & 0\le t<\pi \\ sin2t & 0\le t<2\pi \\ sin3t & 2\pi\le t \end{cases}$			
		b) $f(x)=\begin{cases} 8 & 1\le t<3 \\ 6 & 3\le t<5 \end{cases}$			
	iv.	State and Prove convolution theorem	5	BL03	CO1 PO2
R	v.	Solve $(D^2+9)y=cos2t$ if $y(0)=1, y(\frac{\pi}{2})=-1$	5	BL03	CO4 PO2
3	i.	Find the value of a_0 in the expansion of Fourier series of $f(x)=x^2$ in (-1, 1)	2	BL01	CO1 PO2
	ii.	Find the Fourier series expansion of $f(x)=e^{-x}$ in the interval $-\pi<x<\pi$	4	BL02	CO1 PO2
	iii.	Represent the following function by a Fourier sine series $f(t)=\begin{cases} t & ,0<t\le\frac{\pi}{2} \\ \frac{\pi}{2}, & \frac{\pi}{2}<t\le\pi \end{cases}$	6	BL01	CO1 PO2
OR	iv.	Find the Fourier sine transform of $f(x)=\frac{e^{-ax}}{x}$	6	BL04	CO1 PO2

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