



Shree Sathyam

College of Engineering and Technology

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.
 NH-544, Salem - Coimbatore Highways, Kuppanur, Sankari Taluk, Salem - 637301, TamilNadu, India.
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Internal Assessment-I

DEGREE: BACHELOR OF ENGINEERING										YEAR&SEMESTER: II/III				
BRANCH: MECHANICAL ENGINEERING										REGULATION: 2021				
SUBJECT Code and NAME: MA3351& TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS										DATE & SESSION: 28/9/2024, AN				
TIME: 2Hrs15Minutes										Max.Marks: 60				
Answer The All Questions														
PART A (5x2=10 marks)														
										CO	BL	PO	PI	
1.	Form the partial differential equation by eliminating a& b from $z=(x^2+a^2)(y^2+b^2)$									CO1	L1	1.1	1.4.1	
2.	Eliminate the function ‘f’ from $Z=f(x^2+y^2)$									CO1	L1	1.1	1.1.2	
3.	$(D^3-7DD'^2-6D'^3)Z=0$									CO2	L1	2.3	2.3.1	
4.	Find the particular integral of $(D^2+4DD')Z=e^x$									CO2	L4	2.3	2.3.1	
5.	State Diricheet’s conditions for fourier series.									CO3	L4	3.1	3.1.1	
PART B (5x10=50 marks)														
										CO	BL	PO	PI	
6.	a)	Solve $px+qy=z$								CO1	L3	1.1	1.1.2	
	OR													
	b)	$Solve P \tan x+q \tan y=\tan z$								CO1	L1	2.3	2.3.1	
7.	a)	$Solve x(y-z) p+y(z-x) q=z(x-y)$								CO1	L1	2.3	2.3.1	
	OR													
	b)	$Solve (3z-4y) P + (4x-2z)q = 2y-3x$								CO1	L4	3.1	3.1.1	
8.	a)	$Solve (D^2-2DD'+D'^2) z= \cos(x-3y)$								CO2	L1	1.1	1.1.2	
	OR													
	b)	$Solve (D^2-2DD'+2D'^2) Z = \sin(x-y)$								CO2	L1	1.1	1.1.2	
9.	a)	$Solve (D^2-DD' -20D'^2) Z=e^{5x+y} + \sin(4x-y)$								CO2	L4	2.3	2.3.1	
	OR													
	b)	Find the first two harmonics of the fourier series from the following table								CO2	L4	2.3	2.3.1	
		X	0	1	2	3	4	5						
		Y	9	18	24	28	26	20						
10.	a)	Find the sine series for $f(x) =x$ in $0 <x< \pi$ using R.M.S. value show that								CO3	L3	1.1	1.1.2	
	OR													
	b)	Find the fourier expansion of $f(x) =x$ in $-\pi <x< \pi$								CO3	L4	1.1	1.1.2	

CO Number	Weightage (Marks)	Weightage in%
CO1	44	40
CO2	44	40
CO3	22	20

Faculty In-Charge

HoD

Principal



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Internal Assessment-II

DEGREE: BACHELOR OF ENGINEERING			YEAR&SEMESTER: II/III			
BRANCH: MECHANICAL ENGINEERING			REGULATION: 2021			
SUBJECT Code and NAME: MA3351& TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS			DATE & SESSION: 12/11/2024 & AN			
TIME: 2 Hrs 15 Minutes			Max. Marks: 60 Marks			
Answer The All Questions						
PART A (5 x 2 = 10 Marks)						
			CO	BL	PO	PI
1.	State the Fourier Integral theorem		CO4	L1	1.1	1.4.1
2.	State the Convolution theorem of the Fourier transform		CO4	L1	1.1	1.1.2
3.	The ends A & B of a rod of length 10 cm have their temperatures kept at 20 ^o c and 70 ^o c. Find the steady state temperature distribution on the rod.		CO3	L1	2.3	2.3.1
4.	Find Z(n)		CO5	L4	2.3	2.3.1
5.	Form the difference equation from $y=a+b(3)^n$		CO5	L4	3.1	3.1.1
PART B (5 x 10 = 50 Marks)						
			CO	BL	PO	PI
6.	a)	Using Z transform solve the difference equation $U_{n+2}+4U_{n+1}+3U_n=3^n$ with $U_0=0,U_1=1$	CO5	L3	1.1	1.1.2
	OR					
	b)	State the prove convolution theorem in Z transforms and use it to Find $Z^{-1}\left(\frac{Z^2}{(Z-a)(Z-b)}\right)$	CO5	L1	2.3	2.3.1
7.	a)	i) State the initial and final value theorem. ii) Find the z-transform of unit step function iii) Define unit impulse sequence.	CO5	L1	2.3	2.3.1
	OR					
	b)	Find the Fourier transform of $e^{-a^2x^2}$; a > 0 .Hence, Show that $e^{-\frac{x^2}{2}}$ is self reciprocal under Fourier transform.	CO4	L4	3.1	3.1.1
8.	a)	State & prove Parseval s identity for Fourier transforms.	CO4	L1	1.1	1.1.2
	OR					
	b)	State & prove Convolution theorem in Fourier transforms.	CO4	L1	1.1	1.1.2
9.	a)	Find the Fourier transform of $f(x)=\begin{cases} 1- x & \text{if } x <1, \\ 0 & \text{if } x >1. \end{cases}$ Hence deduce that $\int_0^{\infty}\left(\frac{Sint}{t}\right)^2 dt=\frac{\pi}{2}, \int_0^{\infty}\left(\frac{Sint}{t}\right)^4 dt=\frac{\pi}{3}$	CO4	L4	2.3	2.3.1
	OR					

	b)	A String is stretched and fastened to two points $x = 0$ and $x = 1$ apart. Motion is started by displacing the string into the form $y = k(lx - x^2)$ from which it is released at time $t = 0$. Find the displacement of any point on the string at a distance of x from one end at time t .	CO3	L4	2.3	2.3.1
10.	a)	A tightly stretched string of length l has its ends fastened at $x = 0$ and $x = 1$. The mid point of the string is then taken to a height h and then released from rest in that position. Obtain an expression for the displacement of the string at any subsequent time.	CO3	L3	1.1	1.1.2
	OR					
	b)	A tightly stretched string with fixed end points $x = 0$ and $x = 1$ initially displaced in a sinusoidal wave of length y_0 and then released from rest. Find the displacement y at any distance x from one end at time t .	CO3	L4	1.1	1.1.2

CO Number	Weightage (Marks)	Weightage in%
CO3	32	29.09%
CO4	44	40%
CO5	34	30.91%

FACULTY IN-CHARGE

HOD

PRINCIPAL

