



Shree Sathyam

College of Engineering and Technology

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

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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.	Solve $(D^3-7DD^2-6D^3)Z=0$	CO2	L1	2.3	2.3.1													
4.	Find the particular integral of $(D^2+4DD^2)Z=e^x$	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																	
7.	b) Solve $P \tan x+q \tan y=\tan z$	CO1	L1	2.3	2.3.1													
	OR																	
8.	a) Solve $x(y-z) p+y(z-x) q=z(x-y)$	CO1	L1	2.3	2.3.1													
	OR																	
9.	a) Solve $(3z-4y) P + (4x-2z)q = 2y-3x$	CO1	L4	3.1	3.1.1													
	b) Solve $(D^2-2DD'+D^2) Z = \cos(x-3y)$	CO2	L1	1.1	1.1.2													
OR																		
10.	a) Solve $(D^2-DD'-20D^2) Z=e^{5x+y} + \sin(4x-y)$	CO2	L4	2.3	2.3.1													
	b) Find the first two harmonics of the fourier series from the following table	CO2	L4	2.3	2.3.1													
<table border="1" style="display: inline-table;"><tr><td>X</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Y</td><td>9</td><td>18</td><td>24</td><td>28</td><td>26</td><td>20</td></tr></table>		X	0	1	2	3	4	5	Y	9	18	24	28	26	20			
X	0	1	2	3	4	5												
Y	9	18	24	28	26	20												
	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



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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°c and 70°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
	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				
6.	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
	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				
7.	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
	a) State & prove Parseval s identity for Fourier transforms.	CO4	L1	1.1	1.1.2
	OR				
8.	b) State & prove Convolution theorem in Fourier transforms.	CO4	L1	1.1	1.1.2
	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 $\int_0^{\infty} \left(\frac{\sin t}{t}\right)^2 dt = \frac{\pi}{2}, \int_0^{\infty} \left(\frac{\sin t}{t}\right)^4 dt = \frac{\pi}{3}$	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 1 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 arc 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

