Reg.No: | | | | | | | |

SNS College of Technology, Coimbatore-35.
(An Autonomous Institution)
Internal Assessment -II
Academic Year 2022-2023(Odd)
Third Semester
Department of Mathematics
19MAT201- Transforms And Partial Differential Equations

A

Time: 1.30 Hours **Maximum Marks: 50**

PART – A (5 x 2 = 10 MARKS)
ANSWER ALL QUESTIONS

		BLOOMS	
1.	State linear property for Fourier transform	CO2	(Rem)
2.	Find the Fourier Cosine transform of $2e^{-3x} + 3e^{-2x}$	CO2	(Und)
3.	Form the PDE by eliminating arbitrary constants a and b from $z = (x-a)^2 + (y-b)^2 + 1$	CO3	(App)
4.	Find the complete integral for the PDE $p - q = 0$	CO3	(App)
5.	Solve $(D^2 + DD' - 6D'^2)z = 0$	CO3	(App)

PART –B (13+13+14 = 40 MARKS)
ANSWER ALL QUESTIONS

6.

a)i) Find the Fourier Sine transform of $\frac{e^{-ax}}{x}$ and hence find $F_S\left[\frac{e^{-ax}-e^{-bx}}{x}\right]$ — CO2 — (App) (7)

ii) Evaluate $\int_0^\infty \frac{x^2 dx}{(x^2+a^2)^2}$ — CO2 — (App) (6)

(or)

b)i) Find the Fourier cosine transform of $f(x) = e^{-a|x|}$ and hence show that $\int_0^\infty \frac{\cos sx}{s^2+a^2} dx = \frac{\pi}{2a} e^{-as}$ — (App) CO2 (7)

ii) Using Parseval's identity evaluate $\int_0^\infty \frac{dx}{(x^2+a^2)(x^2+b^2)}$ — CO2 — (APP) (6)

7.	a)i)	Solve $z = px + qy + pq$	CO3	(App) (7)
	ii)	Form the PDE by eliminating the arbitrary function from $\varphi(x^2 + y^2 + z^2, ax + by + cz) = 0$	CO3	(App) (6)
		(or)		
	b) i)	Solve $(3z - 4y)p + (4x - 2z)q = 2y - 3x$	CO3	(App) (7)
	ii)	Solve $(D^2 - 3DD' + D'^2)z = \cos(2x + 3y)$	CO3	(App) (6)
8.	a) i)	Define self reciprocal and analyze whether the function $e^{-a^2x^2}$ is self reciprocal under fourier transform	CO2	(Ana) (7)
	ii)	Solve $(D^2 - 4DD' + 4D'^2)z = e^{2x+y}$	CO3	(App) (7)
		(or)		
	b) i)	Elaborate the applications of Partial differential equations in real life, Engineering and Industry.	CO3	(App) (7)
	ii)	Solve $(D^2 + DD' - 6D'^2)z = ycosx$	CO3	(App) (7)

Rem/Und: Remember/ Understand **App:** Apply **Ana:**Analyze **Eva:** Evaluate **Cre:** Create