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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

B

Time: 1.30 Hours

Maximum Marks: 50

PART – A (5 x 2 = 10 MARKS) ANSWER ALL QUESTIONS			BLOOMS	
1.		State the linear property for Fourier transform	CO2	(Rem)
2.		Find the Fourier Cosine transform of $5e^{-2x} + 2e^{-5x}$	CO2	(Und)
3.		Form the PDE by eliminating arbitrary constants a and b from $z = ax + by + a^2 + ab + b^2$	CO3	(App)
4.		Find the complete integral for the PDE $p + q = pq$	CO3	(App)
5.		Solve $(D^2 - 5DD' + 6D'^2)z = 0$	CO3	(App)
PART –B (13+13+14 = 40 MARKS) ANSWER ALL QUESTIONS				
6.	a)i)	Find the Fourier Cosine transform of $\frac{e^{-ax}}{x}$ and hence find $F_c \left[\frac{e^{-ax} - e^{-bx}}{x} \right]$	CO2	(App) (7)
	ii)	Using Parseval's identity evaluate $\int_0^\infty \frac{dx}{(x^2+a^2)} \int_0^\infty \frac{dx}{(x^2+a^2)}$	CO2	(App) (6)
		(or)		
	b)i)	Find the Fourier cosine and sine transform of $f(x) = e^{-ax}, a > 0$	CO2	(App) (7)
	ii)	Using Parseval's identity evaluate $\int_0^\infty \frac{x^2 dx}{(x^2+a^2)(x^2+b^2)}$	CO2	(APP) (6)

7.	a)i)	Solve $z = px + qy + p^2 - q^2$	CO3	(App) (7)
	ii)	Form the PDE by eliminating the arbitrary function f & g from $z = f(x + t) + g(x - t)$	CO3	(App) (6)
		(or)		
	b) i)	Solve $(mz - ny)p + (nx - lz)q = ly - mx$	CO3	(App) (7)
	ii)	Solve $(D^2 - 4D'^2)z = \sin(2x + y)$	CO3	(App) (6)
8.	a) i)	Define self reciprocal and analyze whether the function $e^{\frac{-x^2}{2}}$ is self reciprocal under fourier transform	CO2	(Ana) (7)
	ii)	Solve $(D^2 - DD' - 20D'^2)z = e^{5x+y}$	CO3	(App) (7)
		(or)		
	b) i)	Elaborate the applications of Partial differential equations in real life, Engineering and Industry.	CO3	(Ana) (7)
	ii)	Solve $r + s - 6t = y \cos x$	CO3	(App) (7)

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