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

SNS College of Technology, Coimbatore-35.
(An Autonomous Institution)
Internal Assessment -III
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.		Find the nature of pde $3u_{xx}+4u_{xy}+6u_{yy}-2u_x-u=0$	CO4	(Rem)
2.		What are the various possible solutions of one dimensional heat equations?	CO4	(Und)
3.		A rod 10 cm long has its ends A and B kept at 20 ^{0}c and 70 ^{0}c respectively until steady state conditions prevail. Find the steady temperature in the rod.	CO4	(App)
4.		Form the Difference Equation $y = A2^n$	CO5	(App)
5.		State the initial and finial value theorem	CO5	(App)
PART –B (13+13+14 = 40 MARKS) **ANSWER ALL QUESTIONS**				
6.	a)	A rod of length 30cm has its ends A and B kept at 20℃ and 80 ℃ until steady state conditions prevail. The temperature at each end is then suddenly reduced to 0℃ and kept so. Find the resulting temperature function u(x, t) x=0 at A.	CO4	(App) (13)
		(or)		
	b)	A tightly stretched string with fixed end points x=0 and x=l is initially at rest in its equilibrium position. If its set vibrating string giving each point a velocity $y = \lambda x(l - x)$. Find the displacement of any point on the string at a distance of x from one end at a time t.	CO4	(App) (13)

7.	a)	Solve the difference equation using z transform $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$ given that $y_0 = y_1 = 0$	CO5	(App) (13)
		(or)		
	b) i) ii)	Find $z(cosat)$ and $z(sinat)$ Using convolution theorem find $z^{-1}\left[\frac{z^2}{(z-a)(z-b)}\right]$	CO5 CO5	(Ana) (7) (App) (6)
8.	a) i)	A string is stretched and fastened at two points x=0 and x=l 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 a time t.	CO4	(App) 14
		(or)		
	b) i) ii)	Find $z^{-1}\left[\frac{z^2}{(z+2)(z^2+4)}\right]$ using Partial fraction method Elaborate the applications of Z-Transform in real life Engineering and Industry fields.	CO5 CO5	(Ana) (7) (App) (7)

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