CONTINUOUS INTERNAL EVALUATION– 2

Dept: BS	Sem / Div: III/A & B	Sub: Transform Calculus, Fourier Series and Numerical Techniques.	S Code: 18MAT31
Date: 01-12-2020	Time: 9:30-11:00 am	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

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QN		Questions	Marks	RBT	COs
		PART A			
1	a	Evaluate the following (i) $L\{\sin t.\sin 2t.\sin 3t\}$ (ii) $L\left\{3^t+\frac{\cos 2t-\cos 3t}{t}+t\sin t\right\}$	8	L2	CO1
	b	Find L{f(t)} when $f(t)=\begin{matrix}E, & 0\le t\le a\\ -E, & a\le t\le 2a\end{matrix}$ where f(t) is periodic function with period is 2a.	8	L3	CO1
	c	Using convolution theorem obtain the inverse Laplace transform of $\frac{s^2}{(s^2+a^2)^2}$	9	L2	CO1
		OR			
2	a	Express $f(t)=\begin{matrix}\cos t, & if\ 0<t<\pi\\ \cos 2t, & if\ \pi<t<2\pi\\ \cos 3t, & if\ t>2\pi\end{matrix}$ in terms of unit step function and hence find L{f(t)}	8	L2	CO1
	b	Find the inverse Laplace transform of (i) $\frac{s+5}{s^2-6s+13}$ (ii) $\cot^{-1}[\frac{s}{a}]$	8	L2	CO1
	c	Solve the differential equation using the Laplace transform method. y''+ 4y'+3y = e^{-t} given y(0) = y^{I}(0)= 1	9	L2	CO1
		PART B			
3	a	Find the inverse z-transform of $\frac{z^3-20z}{(z-2)^3(z-4)}$	8	L3	CO3
	b	Solve the difference equation $u_{n+2}+2u_{n+1}+u_n=n$ with $u_0=0, u_1=0$ by using Z-transforms	8	L3	CO3
	c	Given that $\frac{dy}{dx}=x^2+y^2$ and y (0) =1, to find an approximate value of y	9	L2	CO4

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		at x=0.1 and x=0.2 by Taylor's series method.			
		OR			
4	a	Solve the following difference equation $u_{n+2}-3u_{n+1}+2u_n=2^n$ with $u_0=0, u_1=1$ by using Z-transforms.	8	L3	CO3
	b	Find the inverse z-transform of $\frac{2z^2+3z}{(z+2)(z-4)}$	8	L3	CO3
	c	Use modified Euler 's method to find y (0.1) & y(0.2) given $\frac{dy}{dx}=x-y^2$,y(0) =1 by taking h=0.1. Perform two iterations in each step.	9	L2	CO4