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PES UNIVERSITY, BANGALORE-85

(Established under Karnataka Act 16 of 2013)

UE19/20MA151D

(Lateral Entry only)

END SEMESTER ASSESSMENT , BE IV SEM

December-2021

ENGINEERING MATHEMATICS-II

(Common for All Branches)

Sub Code: **UE19/20MA151D**

Time: 2 Hrs | Answer All Questions | Max Marks: 50

1.	a)	Find the value of 'a' for vector field $\vec{F} = y(ax^2+1)\hat{i} + x(y^2-z^2)\hat{j} + 2xy(z-xy)\hat{k}$ i. $\vec{F}$ *is* source field ii. $\vec{F}$ is sink field iii. $\vec{F}$ is solenoidal field Given x,y > 0	5
	b)	Find the angle between the surface $x^2+y^2+z^2=9$ and $z^2+y^2-3=x$ at (2,-1,2)	5
2.	a)	Evaluate $\int_C \vec{F}.\overrightarrow{dr}$ Where $\vec{F} = y^2\hat{i} + 2xy\hat{j}$ and C is straight line joining (0,0) to (1,2)	5
	b)	Evaluate $\oint_C (3x^2-8y^2)\,dx + (4y-6xy)dy$, using Green's theorem. Where C is the closed curve bounded by $y = x^2$, and $y = \sqrt{x}$	5
3.	a)	Find the Laplace transform of the following function i. $e^{-2t}(2\cos 5t - \sin 5t)$ ii. $t(\cos at)$	5
	b)	Evaluate $L\left[\frac{\cos at - \cos bt}{t}\right]$	5
4.	a)	Solve $\frac{d^2y}{dx^2} + 4\frac{dy}{dt} + 4y = e^{-t}$, using Laplace transforms .given that $y(0)=0, y^1(0)=0,$	6
	b)	Evaluate $L^{-1}\left[\frac{3}{s^2} + \frac{2e^{-s}}{s^3} - \frac{3e^{-2s}}{s}\right]$	4
5.	a)	Find the Fourier series for the function $f(x) = x^2$ in the interval $(-l, l)$	6
	b)	Express $f(x) = x$ as half range sine series in $0 < x < 2$	4