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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belagavi)

II Sem B.E. (Credit System) Mid Semester Examinations - II, March 2017

16MA201 – ENGINEERING MATHEMATICS – II

Duration: 1 Hour | Max. Marks: 20

*Note: Answer any **One** full question from **each Unit.***

		Marks	BT*
	Unit – I		
1. a)	Solve $\frac{d^2y}{dx^2}+4y=x^2+\cos 2x$	5	L*1
b)	By using the method of variation of parameters solve, $(D^2-4D+4)y=\frac{e^{2x}}{x}$	5	L4
2. a)	Solve $(D^2+1)y=2\cos x$, by the method of undetermined coefficients.	5	L3
b)	Solve $x^2y''-2xy'-4y=x^4+\frac{1}{x}$	5	L2
	Unit – II		
3. a)	Rewrie the following using unit step function and find their Laplace transforms $f(t)=\begin{cases} t-1, & 0\le t<2 \\ 3-t, & 2\le t<3 \\ 0, & t\ge 3 \end{cases}$	4	L3
b)	Solve the following differential equation using Laplace transform $x''(t)+4\,x(t)=2t-8, \quad x(0)=1, \quad x'(0)=0$	6	L4
4. a)	Find $L^{-1}\left\{\frac{s+2}{s^2-4s+13}\right\}$	3	L4
b)	Using convolution theorem , find $L^{-1}\left\{\frac{1}{(s^2+1)(s+1)}\right\}$	4	L2
c)	Find $L^{-1}\left\{\frac{3}{s}-\frac{4e^{-s}}{s^2}+\frac{4e^{-3s}}{s^2}\right\}$	3	L3

BT* Bloom's Taxonomy, L* Level

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Duration: 1 Hour

Max. Marks: 20

*Note: Answer any **One** full question from **each Unit.***

			Marks	BT*
		Unit – I		
1.	a)	Solve $(x^2 + y^2)dx - 2xy\,dy = 0$	5	L*3
	b)	If a body originally is at 80^0C cools down to 60^0C in 20 minutes, the temperature of the air being 40^0C. Find the temperature of the body after 40 minutes from the original.	5	L3
2.	a)	Determine the orthogonal trajectory of the family of curves $r^2 = a^2\cos 2\theta$.	5	L3
	b)	Solve $\frac{dy}{dx} - \frac{dx}{dy} = \frac{x}{y} - \frac{y}{x}$	5	L4
		Unit – II		
3.	a)	(i) Find $L\{\cos 6t\cos 4t + 2\sin^3 3t + te^{5t-9}\}$ (ii) Find $L\left\{\int_0^t e^{-t}\cos^2 3t\,dt\right\}$	6	L3
	b)	If $L\{f(t)\} = F(s)$, prove that $L\left\{\frac{f(t)}{t}\right\} = \int_s^\infty F(s)\,ds$	4	L4
4.	a)	(i) Find $L\left\{\int_0^t \frac{e^{5t}\sin t}{t}dt\right\}$, (ii) Find $L\{t^2\sin 3t + 17t\cos 5t\}$	6	L3
	b)	Find the Laplace Transform of f(t) = t ; 0<t<c = 2c –t ; c<t<2c and f(t+2c)= f(t)	4	L4

BT* Bloom's Taxonomy, L* Level

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