Branch: ALL   **Academic Year: 2020-21**

Course Code:FEC 201   **Course Name: Engineering Mathematics II [Choice Based]**

Assignment 1

Ques. No.	Question	Module	Level*	PI	CO
1	**Choose the correct answer from the options below:** **(a)**Determine the order and degree of the differential equation $2x\frac{d^4y}{dy^4} + 5x^2\left(\frac{dy}{dx}\right)^3 - xy = 0$ (i) Fourth order, first degree (ii).Third order, first degree (iii) First order, fourth degree (iv) First order, third degree.	1	1	1.1.1	1
	(b) Which of the following equations is an exact DE? (i) $(x^2 + 1)\,dx - xy\,dy = 0$ (ii). $x\,dy + (3x - 2y)\,dx = 0$ (iii) $2xy\,dx + (2 + x^2)\,dy = 0$ (iv) $x^2y\,dy - y\,dx = 0$	1	1	1.1.1	1
	(c) For exact differential Equation of the form M(x ,y)dx+ N(x ,y)dy = 0 a.$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$ b.$\frac{\partial M}{\partial y} = -\frac{\partial N}{\partial x}$ c.$\frac{\partial M}{\partial y} = 0$ d.$\frac{\partial M}{\partial y}/\frac{\partial N}{\partial x}=1$	1	1	1.1.1	1
	(d) $[\tan(y) +x]\,dx + [x\sec^2y - 3y]dy = 0$ is ------------------D.E. (i)Non-exact (ii)Linear D.E. (ii) Bernoulli's D.E. (iv)Exact D.E.	1	1	1.1.1	1

2	Match the following	1	1	1.1.1	1
	A **B**				
	i) $[dx/dy] + Px = Q x^n$ is a)Exact D.E.				
	ii) For $Mdx+Ndy= 0$ is b)Integrating Factor				
	$\partial M/\partial x - \partial N/\partial y = 0$ c)Linear D.E.				
	iii)$[dx/dy] + Px = Q$ is d)Bernoulli's D.E.				
	iv) For D.E .$Mx+Ny\neq 0$				
	then $\dfrac{1}{Mx+Ny}$				
3	Fill in the blanks	1	1	1.1.1	1
	i)The general solution of the equation $[dy/dx] + Py = Q$ is given by……………………………				
	iii) For what values of a, b the equation $[y + x^3]dx + [ax + by^3]dy = 0$ is exact.				
	(i)a=1,b=1 (ii) a =1, all values of b				
	(iii) for all values of a, b= 1 (iv) none of the above	1	1	1.1.1	1
4	Define the following	1	1	1.1.1	1
	i)Degree of Differential Equation				
	ii)Order of Differential Equation				
	iii)Exact differential equation				
	iv)Bernoullis differential equation				
5.	State True or False	1	1	1.1.1	1
	1.The I.F. of the equation $(1 + x + xy^2)dy + (y + y^3)dx = 0$ is function of y …………				
	2. The equation $\dfrac{dy}{dx} + \dfrac{y\cos x+\sin y+y}{\sin x+x\cos y+x} = 0$ is				

	non-exact D.E. 3. Solution of the equatin $(x^2 + y^2 + 1)\,dx - 2xy\,dy = 0$ is $x - \dfrac{y^2}{x} - \dfrac{1}{x} = C$.				
6	a)Solve $\left[y\left(1 + \frac{1}{x}\right) + \cos y\right] dx + (x + \log x - x \sin y)dy = 0$	1	2	1.1.1	1
	b) Solve $[2y^2 - 4x + 5]dx = [y - 2y^2 - 4xy]dy$	1	2	1.1.1	1
	c) Solve $[2\,x\log x - xy]\,dy + 2ydy = 0$	1	2	1.1.1	1
	d)solve $[x^4 + y^4]dx - xy^3dy = 0$	1	2	1.1.1	1
7	a)Solve Solve $y^4 dx = \left(x^{\frac{-3}{4}} - y^3 x\right) dy$ [Hint: eqn can be written as $\dfrac{dx}{dy} + \dfrac{x}{y} = \dfrac{x^{\frac{3}{4}}}{y^4}$]	1	2	1.1.1	1
	b)Solve $\dfrac{dy}{dx} = -\dfrac{x^2y^3 + 2y}{2x - 2x^3y^2}$	1	2	1.1.1	1
	c)Solve $y(x + y)\,dx - x(y - x)\,dy = 0$	1	2	1.1.1	1
	d)Solve $\left[\log(x^2 + y^2) + \dfrac{2x^2}{x^2+y^2}\right] dx + \left(\dfrac{2xy}{x^2+y^2}\right) dy = 0$	1	2	1.1.1	1
	e)Solve $xy(1 + xy^2)\dfrac{dy}{dx} = 1$. [Hint: equation can be written as $\dfrac{dy}{dx} - xy = x^3y^3$]	1	2	1.1.1	1
8	My Ideas : Explain how you will use differential equation in your daily life.	1	3	1.1.1	1