SET- A

Name: **Student University Roll No.:**	**Printed Pages: 01**
School of Engineering **First Sessional Examination, Even Semester (AS: 2022-23)** **B. Tech: All Branch** **Year: 1st Semester: 2nd**	
Course Title: Differential equations and Fourier Analysis **Course Code: BAS 3201**	**M.M.: 30** **Time: 1 hr**

Instructions if any: Read the question Carefully.

	SECTION 'A'		
	Q.N.1. Attempt all parts of the following:	**Course Objective**	**Marks**
a)	Define order and degree of a differential equation.	**CO**	**1**
b)	Find the complementary function of $(D^3 + D^2)y = x$.	**CO**	**1**
c)	Find the P.I. of $(D^2 - 1)y = 1$.	**CO**	**1**
d)	If $P + Qx = 0$ in $y'' + Py' + Qy = R$ then write one solution of complementary function.	**CO**	**1**
e)	Find the integrating factor of $\frac{dy}{dx} + 3y = e^{2x}$.	**CO**	**1**
	SECTION 'B'	**Course Objective**	**Marks**
	Q.N.2. Attempt any two parts of the following:		
a)	Solve: $y'' - 2y' + 2y = x + e^x cosx$	**CO**	**7.5**
b)	Solve: $x^2y'' - 3xy' + 5y = xlogx$	**CO**	**7.5**
c)	Solve: $\frac{d^3y}{dx^3} - \frac{d^2y}{dx^2} + 4\frac{dy}{dx} - 4y = e^x$	**CO**	**7.5**
d)	Solve: $y'' - 4xy + (4x^2 - 2)y = 0$ given that $y = e^{x^2}$ is an integral included in complementary function.	**CO**	**7.5**

	SECTION 'C'	**Course Objective**	**Marks**
	Q.N.3. Attempt any one part of the following		
a)	Solve: $\frac{d^2y}{dx^2} - y = \frac{2}{1+e^x}$, by method of variation of parameter.	**CO**	**10**
b)	Solve: $\frac{d^2y}{dx^2} - \frac{1}{x}\frac{dy}{dx} + 4x^2y = x^4$ by changing the independent variable.	**CO**	**10**
c)	Solve the simultaneous differential equations: $\frac{dx}{dt} = 3x + 8y$ $\frac{dy}{dt} = -x - 3y$ With x(0)=6, y(0)=-2	**CO**	**10**

Table 1: Mapping between COs and questions
(Number of COs may vary from course to course)

COs	**Questions Numbers**	**Total Marks**
CO1	1a	1
CO2	3b, 3c	20
CO3	1b, 1c, 1e, 2a, 2b, 2c	25.5
CO5	1d, 2d	8.5