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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

B.Tech

FIRST YEAR (SEMESTER-II) THEORY EXAMINATION (2020-2021)

(Subjective Type)

Subject Code: AAS0203 **Max. Mks. : 30**

Subject: Engineering Mathematics-II **Time : 50 Minutes**

General Instructions:

All questions are compulsory.

Question No. 1 to 15 are subjective type question carrying 3 marks each. Attempt any 10 out of 15 questions.

Q.No	Question Content	Question Image	Category	Sub Category	Marks	Options Randomization	Type	Difficulty
1		Find the new differential equation from $\frac{d^2y}{dx^2}-\frac{1}{x}\frac{dy}{dx}+4x^2y=x^4$ by changing the independent variable.	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
2		Find the complementary function of the second order linear differential equation $x^2y''+xy'+y=\log x^2$	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
3		Find the particular integral of differential equation $(D^2+4D+8)y=\sin(2x+3)$.	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
4		Find Fourier series of $f(x)=x^3$ in $(-\pi,\pi)$	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
5		Obtain half range sine series for $f(x)=e^x,\ 0<x<1$	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
6		Test the convergence of the series $\sum_{n=1}^{\infty} u_n$ where $u_n=\frac{2^n}{n^2+1}$	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant

Q.No	Question Content	Question Image	Category	Sub Category	Marks	Options Randomization	Type	Difficulty
7		Find Laplace transform of the function $F(t) = te^{-4t}\sin 3t$	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
8		Find the inverse Laplace transform of the function $f(s) = \frac{1}{s^3} - \frac{3}{s^2+4}$	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
9		Express the following function in terms of unit step function $f(t) = \begin{cases} \sin t & 0 < t < \pi \\ \sin 2t & \pi < t \end{cases}$	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
10		If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$, then show that grad $r^n = nr^{n-2}\vec{r}$, where $r = \lvert\vec{r}\rvert$.	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
11		If $\vec{F} = 3xy\hat{i} - y^2\hat{j}$, evaluate $\int_C \vec{F}.d\vec{r}$, where C is the curve in the arc of the parabola $y = 2x^2$ from (0,0) to (1,2).	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
12	Sanjeev walks 10 m towards the South. Turning to the left, he walks 20 m and then moves to his right. After moving a distance of 20 m, he turns to the right and walks 20 m. Finally, he turns to the right and moves a distance of 10 m. How far and in which direction is he from the starting point?		Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
13	Write the statement of Stoke's theorem.		Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
14		The ratio of present ages of Suresh and Mahesh is 7:5. If after 6 years their ages will be in the ratio of 4:3, find the present age of Mahesh?	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
15		Introducing a woman, Shashank said, “She is the mother of the only daughter of my son.” How that woman is related to Shashank?	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant