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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

M.Tech (Int.)

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

(Subjective Type)

Subject Code: AMIAS0203

Subject: Engineering Mathematics-II

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	Туре	Difficulty
1		Find the new anterential equation from $\frac{dx^2}{dx^2} + \frac{dx}{x} \frac{dy}{dx} = x^4$ 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 $x^2y^2 + xy^2 + y = \log x^2$	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
3		Find the particular integral of differential equation $(D^1+4D+8)y = an(2x+3)$,	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

Max. Mks. : 30 Time : 50 Minutes

Roll No.

Q.No	Question Content	Question Image	Category	Sub Category	Marks	Options Randomization	Туре	Difficulty
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
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 $r^n = m^{n-2}\vec{r}$, where $r = \vec{r} $.	Attempt any 10 questions	10 x 3=30	3		Subjective	Brilliant
11		$\mathbf{H}^{2} = 3xy^{2} - y^{2}j^{2}, \text{ evaluate } \int_{t}^{T} d\vec{r}, \text{ where } C \text{ is the curve in the arc of the parabola } y = 2x^{2} \text{ from } (0,0) \text{to } (1,2).$	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