DAE/IIA-2018/08 SECOND YEAR

(Common with Bio Medical, Computer, Food Computer Information, Electrical, Electronics, Food Processing & Preservation, Instrument, Critical Health Care and Telecommunication Technologies.)

MATH-233 APPLIED MATHEMATICS – II

PAPER – B (PART – B)

Time: 2:30 Hours **Marks: 60**

SECTION – I

Q.1: Write short answer to any Eighteen (18) of the questions: - $18 \times 2 = 36$

1.	Find $\int (2x+9)^{-5/2}\,dx$	**2.**	Find $\int \frac{1}{\sqrt[3]{(3x+4)^2}}\,dx$
3.	Find $\int \left(x+\frac{1}{x}\right)^2 dx$	**4.**	Find $\int \left(\frac{1}{t^3}+\frac{1}{t^2}-2\right) dt$
5.	Find $\int \left(\frac{-2x}{\sqrt{4-x^2}}\right) dx$	**6.**	Find $\int \left(\frac{x^2+1}{x+1}\right) dx$
7.	Find $\int \left(1+\frac{3}{x^2}\right)^2 dx$	**8.**	Evaluate $\int \frac{dx}{x(1+\ell nx)}$
9.	Evaluate $\int (x\cos x)dx$	**10.**	Evaluate $\int (x\sec^2 x)dx$
11.	Evaluate $\int (\ell n x)dx$	**12.**	Evaluate $\int (x\ell nx)\,dx$
13.	Find $\int (x.\sin x)\,dx$	**14.**	Evaluate $\int_0^3 \sqrt[3]{(3x-1)^2}\,dx$
15.	Evaluate $\int_1^3 \frac{1}{x+1}dx$	**16.**	Evaluate $\int_{\pi/6}^{\pi/3} (\sin 2x)dx$
17.	Evaluate $\int_{\pi/6}^{\pi/3} (\operatorname{cosec}^2 x)dx$	**18.**	Define differential equation and give example.
19.	Define the Order of differential equation with example.	**20.**	Define the Degree of differential equation with example.
21.	What is general solution of differential equation?	**22.**	What the particular solution of differential equation?
23.	What is Laplace transformation of $\sin 7t$?	**24.**	If $L\{e^{at}\} = \frac{1}{s-a}$ then what will be the Laplace transformation of e^{-4t}.
25.	What is Laplace transformation of $\cos 6t$?	**26.**	Define inverse Laplace transformation.
27.	What is the most important method to find the inverse Laplace transformation of function?		

SECTION – II

Note: Attempt any three (03) questions. $3 \times 8 = 24$

Q.2. **[a]** Evaluate $\int\left(\frac{\sin\sqrt{x}}{\sqrt{x}\cos\sqrt{x}}\right)dx$

[b] Evaluate $\int\left(\sin^3 x \cos x\right)dx$

Q.3. **[a]** Evaluate $\int\left(\cot^3 2x \ \text{cosec}^3\ 2x\right)dx$

[b] Evaluate $\int\left(\sin^{-1} x\right)dx.$

Q.4. **[a]** Evaluate $\int_0^a \frac{dx}{\sqrt{x+a}+\sqrt{x}}$

[b] Show that area of a circle of radius r is πr^2.

Q.5. **[a]** Find the general solution of equation $ydx - xdy = x\left(dy - ydx\right)$

[b] Find the particular solution of: $dy = x\left(2ydx - xdy\right)$ subject to the conditions $x = 1,\ y = 4.$

Q.6. Expand the Fourier Series; $f(x) = \begin{cases} 1, & 0 \le x \le \pi \\ 2, & \pi \le x \le 2\pi \end{cases}$ Period 2π.

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