DAE/IIA-2020/08 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.	Evaluate $\int\left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)^2 dx$	**2.**	Find $\int\left(3t-\sqrt{3t}+\frac{1}{\sqrt{t}}\right)dt$
3.	Evaluate $\int\left(\sec^2 x \operatorname{cosec}^2 x\right)dx$	**4.**	Find $\int\left(\frac{\sin x}{\sqrt{1+\cos x}}\right)dx$
5.	Evaluate $\int\left(\frac{x}{x^2+1}\right)dx$	**6.**	Find $\int\left(e^{3x}+e^{5x}\right)dx$
7.	Integrate $\int\left(e^x \sin e^x\right)dx$	**8.**	Find $\int\frac{\left(\tan^{-1}x\right)^3}{1+x^2}dx$
9.	Evaluate $\int(x\ell nx)\,dx$	**10.**	Find $\int\left(\frac{1}{25+x^2}\right)dx$
11.	Evaluate $\int_{-3}^{-1}\frac{dx}{(x-1)^2}$	**12.**	Evaluate $\int_0^{\pi/4}\left(1+\sec^2 x\right)dx$
13.	Find area bounded by y = 3x, $y = x^2$ between x = 1 and x = 3.	**14.**	Evaluate $\int_1^{\sqrt{3}}\left(\frac{1}{1+x^2}\right)dx$
15.	Evaluate $\int_0^2\left(\frac{x^3}{x+1}\right)dx$	**16.**	Evaluate $\int\left(\operatorname{cosec}^2 x\sqrt{\cot x}\right)dx$
17.	Evaluate $\int\left(\frac{\sin x}{a+b\cos x}\right)dx$	**18.**	Evaluate $\int\left(\frac{\sqrt{1+\ell n x}}{x}\right)dx$
19.	Find the general solution of $xdy = 3ydx$	**20.**	Write down the formula for extended rule of integration.
21.	Find the order and degree of differential equation $\left[\frac{d^2y}{dx^2}\right]^3-\left[\frac{d^3y}{dx^3}\right]^2=y$	**22.**	Solve the differential equation $\left(e^x+e^{-x}\right)\frac{dy}{dx}=\left(e^x-e^{-x}\right)$
23.	If a function is even integrable on $[-\pi,\pi]$ then which co-efficient exist.	**24.**	Let $f(t)=2\sin wt$. Find $L\{f(t)\}$.
25.	Find the Laplace transform of $3t+4$.	**26.**	What is the main use of Laplace transformation?
27.	What is the inverse transformation of $\frac{1}{s+a}$?		

SECTION – II

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

Q.2. [a] Evaluate $\int \left(\sin^4 x\right) dx$

[b] Evaluate $\int \left(\frac{1}{\sqrt{x+a}+\sqrt{x+b}}\right) dx$

Q.3. [a] Evaluate $\int \frac{dx}{\left(x^2+a^2\right)^2}$.

[b] Evaluate $\int \left(e^{ax} \cos bx\right) dx$.

Q.4. [a] Evaluate $\int_1^3 \frac{dx}{x^2-16}$

[b] Find the area bounded by the curves: $y = x^3$ and $y = 4x^2$.

Q.5. [a] Find the general solution of $(x+1)\frac{dy}{dx} = x\left(y^2+1\right)$

[b] Show that $y = ce^{x^2}$ is the solution of differential equation $\frac{1}{x}\frac{dy}{dx} - 2y = 0$.

Q.6. [a] Find $L\left\{t^2 - 2t\right\}$

[b] Find $L^{-1}\left\{\frac{1}{s\left(s^2+1\right)}\right\}$

****