

DAE/IA-2019/08 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 × 2 = 36

1.	Find $\int (e^{3x} + e^{5x}) dx$	2.	Evaluate $\int (3x^2 + 2x + 1) dx$
3.	Evaluate $\int \left(\frac{1+x}{x}\right) dx$	4.	Find $\int (e^x + e^{2x} + e^{3x}) dx$
5.	Find $\int \sqrt{x} \left(x^5 + \frac{1}{x}\right) dx$	6.	Evaluate $\int \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 dx$
7.	Evaluate $\int \frac{1}{2} \left(e^{\frac{1}{2}x} - e^{-\frac{1}{2}x}\right) dx$	8.	Find $\int \frac{1}{25 + x^2} dx$
9.	Find $\int (x^2 \cos x^3) dx$	10.	Find $\int \left(\frac{1}{x(\ln x)}\right) dx$
11.	Find $\int \frac{\sin^{-1} x}{\sqrt{1-x^2}} dx$	12.	Find $\int (\cos^3 x) dx$
13.	Find $\int (\cos^4 x \cdot \sin x) dx$	14.	Find value of $\int_0^{\pi/4} (\cos^2 x) dx$
15.	Find value of $\int_0^{\pi/2} (\tan^2 x) dx$	16.	Find value of $\int_0^{\pi/2} (\sin^2 x \cos x) dx$.
17.	Find value of $\int_0^{\pi} (x \cos x) dx$	18.	Solve the differential equation $x^2 \frac{dy}{dx} = \cos^2 y$
19.	Find the solution of $\frac{dy}{dx} = -\sin x + 3x^2$	20.	Find the solution of $\frac{dy}{dx} = 1 + x + y + xy$
21.	Find the value of $\cos^2 x \frac{dy}{dx} + \cos^2 y = 0$	22.	Find the value of $\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$
23.	What is the inverse transformation of $\frac{1}{s+a}$?	24.	What is inverse Laplace transformation of the function $\frac{4}{s^2 + 16}$?
25.	Find $L^{-1} \left\{ \frac{1}{s-a} - \frac{1}{s+a} \right\}$	26.	What is inverse Laplace transform of $\frac{2}{s^3}$?
27.	Define Fourier Series?		

SECTION - II

Note: Attempt any three (03) questions.

3 × 8 = 24

Q.2. [a] Evaluate: $\int \frac{dx}{1 + \sin x}$

[b] Evaluate: $\int (\sin x + \cos x)^n (\cos^2 x - \sin^2 x) dx$

Q.3. [a] Evaluate $\int \ln(x + \sqrt{x^2 + 1}) dx$

[b] Evaluate $\int \frac{dx}{(a^2 - x^2)^{3/2}}$

Q.4. [a] Calculate $\int_0^{\pi/3} \frac{dx}{1 - \sin x}$

[b] Find the area of the region enclosed by curve $y = 3 - x^2$ and the line $y = -x + 1$.

Q.5. [a] Find the general solution of equation: $dx + xydy = y^2 dx + ydy$

[b] Find the particular solution satisfying the given boundary conditions
 $2x dx - dy = x(xdy - ydx)$ given $y = 1$ when $x = -3$.

Q.6. Prove that:

(i) $L\{e^{at} \cos \omega t\} = \frac{s - a}{(s - a)^2 + \omega^2}$

(ii) $L\{e^{at} \sin \omega t\} = \frac{\omega}{(s - a)^2 + \omega^2}$
