

DAE/IIA-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 $\int (\tan^2 x \operatorname{cosec}^2 x) dx$	2.	Find $\int (\sec 3x \tan 3x) dx$
3.	Evaluate $\int \cos^2 x dx$	4.	Find $\int (\tan^2 x) dx$
5.	Evaluate $\int (\sin x - \cos x)^2 dx$	6.	Find $\int (\tan x + \cot x)^2 dx$
7.	Find $6 \int x^2 e^{x^3} dx$	8.	Find $\int \frac{\sin^{-1} x}{\sqrt{1-x^2}} dx$
9.	Integrate $\int \frac{\cos(\ln x)}{x} dx$	10.	Find $\int \left(\frac{x-1}{x^2-2x+3} \right) dx$
11.	Find $\int (\cot^2 x) dx$	12.	Find $\int (2 \sec 2x) dx$
13.	Find $\int (\sin^9 x \cos x) dx$	14.	Evaluate $\int_0^{\pi/4} (\sec x \tan x) dx$
15.	Evaluate $\int_0^b (x^3 \cos x^4) dx$	16.	Evaluate $\int_0^{\pi/2} \left(\frac{\cos x}{3+4 \sin x} \right) dx$
17.	Evaluate $\int_0^{\pi/6} (2 \sin 2x) dx$	18.	Find the solution of $\frac{dy}{dx} = -4xy^2$
19.	Find the solution of $\frac{dy}{dx} = \frac{x}{y^2}$	20.	Find the solution of $\frac{dy}{dx} = \frac{y}{4+x^2}$
21.	Find the general solution of $x dy = 3y dx$	22.	Find the solution of $3x^2(1+y^2) dx = dy$
23.	Prove that: $L\{u'(t)\} = sL\{u(t)\} - u(0)$	24.	Write the formula for $L\{u''(t)\}$.
25.	Write Laplace transformation of e^{at} .	26.	If $L\{t^n\} = \frac{n!}{s^{n+1}}$ then what will be $L\{t^7\}$.
27.	Write Laplace transformation $t e^{at}$.		

SECTION - II

Note: Attempt any three (03) questions.

3 × 8 = 24

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

[b] Evaluate $\int \frac{dx}{x^{1/3} (x^{2/3} - 1)}$

Q.3. [a] Evaluate $\int (\sin^2 x \cos^3 x) dx$

[b] Evaluate $\int \left(\frac{1}{\sqrt{a^2 - x^2}} \right) dx$

Q.4 [a] Calculate the integral $\int_0^3 \sqrt[3]{(3x - 1)^2} dx$

[b] Find area between the curve $y = 3x^2 - 3$ and x - axis.

Q.5. [a] Find the general solution of equation $(y + xy) dx + (x - xy^2) dy = 0$

[b] Find the general solution of differential equation: $3x^2y^2 dx + y^2 dx + dy = 0$,
Given $y = 1$ when $x = 2$.

Q.6. Find the Laplace transformation of the following functions:

(i) $f(t) = e^{at}$ when $t \geq 0$, and a is constant.

(ii) If $f(t) = 2\sin wt$. Find $L\{f(t)\}$.
