

DAE/IA-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 × 2 = 36

1.	Evaluate $\int \left(12 - \frac{2}{t^2} + \frac{4}{t^3}\right) dt$	2.	Find $\int \left(\frac{x^4}{x+1}\right) dx$
3.	Evaluate $\int (\sec^4 x) dx$	4.	Evaluate $\int (\sqrt{\sin x \cos x}) dx$
5.	Evaluate $\int \left(\frac{e^{2x}}{1+e^{2x}}\right) dx$	6.	Evaluate $\int \left(\frac{x^3 + x^2 + x + 1}{\sqrt{x}}\right) dx$
7.	Integrate $\int (e^{\tan x} \sec^2 x) dx$	8.	Evaluate $\int (\sin^3 x) dx$
9.	Evaluate $\int (e^x \sin x) dx$	10.	Evaluate $\int \frac{1}{a^2 + 9x^2} dx$
11.	Evaluate $\int_1^8 \frac{dx}{\sqrt[3]{x}}$	12.	Evaluate $\int_0^{\pi/4} (\tan^2 x) dx$
13.	Find the area bounded by the line $3x - y - 3 = 0$ and $x = 1$ & $x = 5$.	14.	Evaluate $\int_0^1 \frac{1}{\sqrt{1-x^2}} dx$
15.	Evaluate $\int_1^3 \frac{2x-1}{x^2-x+1} dx$	16.	Find $\int \left(\frac{\sin^2 x}{\cos^4 x}\right) dx$
17.	Evaluate $\int \frac{dx}{(1+x^2)\tan^{-1} x}$	18.	Evaluate $\int \frac{dx}{x(\ln x)^4}$
19.	Find the solution of $\frac{dy}{dx} = -\sin x + 3x^2$	20.	Find the solution of $dy = e^{x+y} dx$
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.	What are Fourier coefficients.
23.	If a function is even integrable on $[-\pi, \pi]$ then which co-efficient exist.	24.	Let $f(t) = \cos 3t$, Find $L\{f(t)\}$.
25.	Find the Laplace transform of $t^2 + at + b$	26.	Write the formula for $L\{u''(t)\}$.
27.	Find the inverse Laplace transformation of $\frac{5}{s-3}$.		

SECTION - II

Note: Attempt any three (03) questions.

3 × 8 = 24

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

[b] Evaluate $\int \left(\frac{ax + bx^{-3} + cx^{-7}}{x^{-2}} \right) dx$

Q.3. [a] Evaluate $\int \frac{dx}{\sqrt{a^2 + x^2}}$

[b] Evaluate $\int (\sec^2 x \ln \tan x) dx$

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

[b] Compute the area of the region bounded by the curve $y = x^4$ and line $y = 8x$.

Q.5. [a] A particle is moving in a straight line and its acceleration is given by $a = 4t + 9$.

(i) Find the v (velocity) in terms of t if $v = 15\text{m/sec}$, when $t = 0$.

(ii) Find s (distance) in terms of t if $s = 0$, when $t = 0$.

Q.6. [a] Find $L\{t^3\}$.

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