

**DAE/IIA-2017/08 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 $\int \left( \frac{ax + bx^{-3} + cx^{-7}}{x^{-2}} \right) dx$	2.	Evaluate $\int \frac{1}{2} \left( e^{\frac{1}{2}x} - e^{-\frac{1}{2}x} \right) dx$
3.	Solve $\int \left( \frac{\cos^2 x - \sin^2 x}{\sin 2x} \right) dx$	4.	Evaluate $\int (\tan^4 x + \tan^2 x) dx$
5.	Evaluate $\int (\sin x - \cos x)^2 dx$	6.	Integrate $\int \left( \frac{\sin 2x}{1 + \sin^2 x} \right) dx$
7.	Integrate $\int \cos x \sin 3x dx$	8.	Evaluate $\int \frac{dx}{x(1 + \ln x)}$
9.	Evaluate $\int (\sin^3 x) dx$	10.	Integrate $\int (\sin^{-1} x) dx$
11.	Find $6 \int x^2 e^{x^3} dx$	12.	Integrate $\int \frac{\cos(\ln x)}{x} dx$
13.	Find $\int \frac{1}{25 + x^2} dx$	14.	Calculate the Integral $\int_0^{\pi/4} (\sin^2 x) dx$
15.	Evaluate $\int_0^3 \sqrt[3]{(3x-1)^2} dx$	16.	Evaluate $\int_0^{\pi/2} \left( \frac{\cos x}{3 + 4 \sin x} \right) dx$
17.	17. Evaluate $\int_0^1 (x e^x) dx$	18.	Find the general solution $x^2 \frac{dy}{dx} = \frac{1}{y^2 + \sqrt{y}}$
19.	Find the general solution $(e^x + e^{-x}) \frac{dy}{dx} = (e^x - e^{-x})$	20.	Solve the differential equation $x^2 \frac{dy}{dx} = \cos^2 y$
21.	Find the particular solution of the equation $\frac{dy}{dx} = 2xy$ , given that $y = 1$ when $x = 0$	22.	Define differential equation and give example.
23.	What is Fourier Series?	24.	Find Laplace transform of a constant 'k'.
25.	Find the inverse Laplace transformation of $\frac{5}{s-3}$	26.	Write Laplace transform of $e^{at}$ .
27.	Define Laplace Transformation.		

SECTION - II

Note: Attempt any three (03) questions.

3 × 8 = 24

**Q.2. [a]** Evaluate  $\int \left( \frac{x^4}{x+1} \right) dx$

**[b]** Evaluate  $\int (\tan^4 x) dx$

**Q.3. [a]** Integrate by substitution method  $\int \frac{dx}{\sqrt{25-16x^2}}$

**[b]** Evaluate  $\int e^{3x} \sin 2x dx$ .

**Q.4. [a]** Solve the  $\int_0^{16} \frac{\sqrt{x}}{1+\sqrt{x}} dx$

**[b]** Find the area of the region enclosed by parabola  $y = 2 - x^2$  and line  $y = -x$ .

**Q.5. [a]** Find the general solution  $x \frac{dy}{dx} = y^2 - 3y + 2$

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

**Q.6.** If  $f(t) = 2\sin wt$ . Find  $L\{f(t)\}$ .

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