



C20-EC-CHPC-301

7239

BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

DECE – THIRD SEMESTER (COMMON) EXAMINATION

ENGINEERING MATHEMATICS—II

Time : 3 Hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.

1. Evaluate $\int x^9 + \cos x + e^x dx$

2. Evaluate $\int \frac{3}{x} + 3^x + x^3 dx$

3. Evaluate $\int \frac{\sec^2(\log x)}{x} dx$

4. Evaluate $\int x^3 \log x dx$

5. Evaluate $\int_0^1 (x-2)(x+3) dx$

6. Find the area of the region bounded by $y^2 = 4x$ between $x = 0$ and $x = 3$.

7. Find the mean value of $y = x e^x$ on $[0, 1]$.

8. Form the differential equation by eliminating the arbitrary constants A, B from the equation $y = A \cos 5x + B \sin 5x$.

9. Solve $\frac{dy}{dx} = e^{x-y}$ *

10. Find the integrating factor of $\frac{dy}{dx} + y \cot x = \operatorname{cose} x$.

PART—B

8×5=40

Instructions : (1) Answer **all** questions.

(2) Each question carries **eight** marks.

11. (a) Evaluate $\int \sin^5 x \cdot \cos^3 x \, dx$

(OR)

(b) Evaluate $\int \frac{1}{x^2 + 8x + 20} \, dx$

12. (a) Evaluate $\int \frac{x}{(x-7)(x-5)} \, dx$

(OR)

* (b) Evaluate $\int x \cdot \sin 2x \cdot \cos x \, dx$

13. (a) Evaluate $\int_0^1 x(1-x)^7 \, dx$

(OR)

*

(b) Evaluate $\int_0^{\frac{\pi}{2}} \frac{1}{1 + \cot x} dx$

14. (a) Find the area bounded by $y^2 = 8x$ and the line $2x - y - 8 = 0$.

(OR)

(b) Find the RMS value of $y = x^2 + 2$ on $[0, 2]$.

15. (a) Find the volume generated by revolution of $\frac{x^2}{64} + \frac{y^2}{16} = 1$ about X-axis.

(OR)

(b) Evaluate $\int_1^2 \frac{1}{x} dx$ approximately by using Simpson's rule by dividing

$[1, 2]$ into 10 equal parts.

PART—C

10×1=10

Instructions : (1) Answer the following question.
(2) The question carries **ten** marks.

16. Solve $(y^2 - xy) dx = x^2 dy$
