



C16-A-301/C16-AA-301/C16-AEI-301/
C16-CH-301/C16-CHST-301/
C16-MET-301/C16-MNG-301/
C16-TT-301/C16-BM-301/C-16/PCT-301
6201

BOARD DIPLOMA EXAMINATION, (C-16)
OCT/NOV—2018
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.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate $\int (a \cos x + b \sin x + c) dx$.
2. Evaluate $\int \sqrt{1 - \cos 2x} dx$.
3. Find the value of $\int_1^2 x + \frac{1}{x} dx$.
4. Find the area bounded by the curve $2y = x^2$, x -axis between $x = 1$ to $x = 3$.
5. Find $L(at^2 + bt + c)$.

*

6. Find $L^{-1} \frac{s^2 - 4}{s^3}$.

7. Write down the Fourier series expansion for a given function $f(x)$ over the interval $(0, 2)$ and provide formulae for finding Fourier coefficients.

8. Form the differential equation by eliminating A, B from $y = AC^{2x} + BC^{-2x}$.

9. Solve $\frac{dx}{dy} = \frac{y}{x}$.

10. Solve $(2D^2 - 3D - 1)y = 0$.

PART—B

5×10=50

Instructions : (1) Answer any **five** questions.

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

(3) The answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Find:

(a) $\int \frac{1}{1 + \cos x} dx$

(b) $\int \frac{1}{x^2 - 6x + 18} dx$.

12. (a) Evaluate $\int x^2 \sin 2x dx$ using formula for integration by parts.

(b) Evaluate $\int_1^e \frac{1 + \log x}{x} dx$.

- * **13.** (a) Find the RMS value of $\cos x$ from $x = 0$ to $x = \pi$.
- (b) Find the volume of solid of revolution obtained by rotating $x^2 + y^2 = 4$ about x -axis between the limits $x = -1, x = 1$ using integration.

- 14.** (a) Evaluate $\int_0^1 \frac{x^3}{x} dx$ using Simpson's rule taking six equal intervals.

(b) Find $L^{-1} \frac{e^t}{t}$.

15. (a) Find $L^{-1} \frac{s^2 + 2}{s^2 + 4s + 13}$.

(b) Find $L^{-1} \frac{1}{s + s^2 + 9}$ using convolution theorem.

- 16.** Find the Fourier series expansion of x^2 in the interval $(-\pi, \pi)$.

17. Solve:

(a) $(\cos x + 2x)y dx + (x^2 + \sin x)dy = 0$

(b) $\frac{dy}{dx} + \frac{y}{1-x} = \frac{1}{1-x}$.

- * **18.** (a) Solve $(D^2 + 4D + 4)y = e^{3x}$.

(b) Find the particular integral of $\frac{d^2y}{dx^2} + \frac{dy}{dx} + 2y = \sin x + x$.
