



C16-A-AA-AEI-CH-CHST-MET-MNG-TT-
BM-C-CM-IT-EC-CHPC-PCT-EE-CHPP-
PET-M-CHOT-RAC-301

6201

BOARD DIPLOMA EXAMINATION, (C-16)

AUGUST/SEPTEMBER—2021

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 : $\int (e^x + \sin x + x) dx$

2. Evaluate : $\int \frac{1}{1+x^2} dx$

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

4. Find the area bounded by the parabola $y = x^2$ from $x = 0$ to $x = 1$.

5. Find $L(1 + \cos t - e^{2t})$

6. Find $\int_0^{\pi/4} \sec^2 x dx$

7. Find the Fourier coefficient a_0 for $f(x) = x^2$ in $0 < x < 2\pi$.
8. Find the differential equation to the family of curves $y = a \cos x$, where a is arbitrary constant.
9. Solve : $\frac{dy}{dx} = \frac{x}{y}$
10. Solve : $(D^2 - 6D + 8)y = 0$

PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
 (2) Each question carries **ten** marks.

11. (a) Evaluate : $\int \frac{1}{(x-1)(x-2)} dx$

(b) Evaluate : $\int \sin^3 x \cos x dx$

12. (a) Evaluate : $\int \frac{\sin^{-1} x}{\sqrt{1-x^2}} dx$

(b) Evaluate : $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx$

13. (a) Evaluate : $\int_1^3 \left(3x^2 + 5x + 2 + \frac{1}{x} \right) dx$

(b) Find the volume of the solid formed by $y^2 = 4x$ revolving about x -axis from $x = 0$ to $x = 1$.

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14. Evaluate $\int_1^{11} x^2 dx$ using Simpson's rule by taking $n = 10$.

15. (a) Find the RMS value of $\sqrt{8 - 4x^2}$ between the lines $x = 0$ and $x = 1$.

(b) Find $L\{t(e^{2t} + 1)\}$

16. Find the Fourier series for the function $f(x) = x$ in the interval $[-\pi, \pi]$.

17. (a) Solve : $\frac{dy}{dx} + \frac{y}{x} = x^2$

(b) Solve : $(x^2 + 1)dx + (1 + y^2)dy = 0$

18. Solve : $(D^2 + 5D + 6)y = e^x + e^{-x}$

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