



C16-M-301/C16-CHOT-301/C16-RAC-301

6242

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2018

DME—THIRD SEMESTER 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 :

$$\frac{e^{\cos^{-1} x}}{\sqrt{1-x^2}} dx$$

2. Evaluate :

$$\frac{3x^2}{x^3} - \frac{2x}{x^2} + \frac{1}{7} dx$$

3. Evaluate :

$$\int_0^{\sqrt{3}} \frac{dx}{1+x^2}$$

4. Find the mean value of $y^2 = \frac{1}{x}$ from $x = 1$ to $x = 3$.

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5. Find $L(t^3 e^{-5t})$.

6. Find the inverse Laplace transform of $\frac{3}{s^2 - 4} - \frac{1}{s - 5} + \frac{5}{s^2 - 4}$.

7. Find the Fourier coefficient b_1 for the function $f(x) = x$ in the interval $(0, 2)$.

8. Solve :

$$\frac{dy}{dx} = \sqrt{\frac{1 - y^2}{1 - x^2}}$$

9. Find the particular integral of $(D^2 - 4)y = e^{2x}$.

10. Find the differential equation from $y = ae^{9x} + be^{-9x}$ by eliminating a and b .

PART—B

10×5=50

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

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

11. (a) Evaluate :

$$\int \sqrt{x^2 - 2x - 3} dx$$

(b) Evaluate

$$\int \frac{1}{5 - 4 \sin x} dx$$

12. (a) Integrate $x \tan^{-1} x$ w.r.t. x .

(b) Evaluate :

$$\int_0^{\pi/2} \frac{\cos^3 x}{\sin^3 x \cos^3 x} dx$$

13. (a) Find the area of the region bounded by the curve $y = 3x^2$, x -axis and the line $x = 3$.

(b) Find the volume of the solid generated by revolving the area bounded by the ellipse $16x^2 + 25y^2 = 400$ about its minor axis.

- * 14. (a) Evaluate :

$$\int_1^{11} x^3 dx$$

using trapezoidal rule by taking $n = 10$

- (b) Find $L\{e^{-3t} \sin 4t \cos 3t\}$.

15. (a) Find :

$$L^{-1} \frac{1}{(s^2 - 5s + 6)}$$

- (b) Find :

$$L^{-1} \frac{1}{(s-1)(s-2)}$$

by using convolution theorem.

16. Expand the function $f(x) = x^2$ as a Fourier series in $(0, 2\pi)$.

17. (a) Solve :

$$\frac{dy}{dx} = y \tan x - \cos x$$

- (b) Solve :

$$(3x - y + 1)dx + (5y - x + 3)dy = 0$$

18. (a) Solve :

$$(D^2 - 3D - 2)y = e^{2x}$$

- (b) Solve :

$$(D^2 - 25)y = \sin 5x$$
