



CI6-EE-301/C16-CHPP-301/C16-PET-301

6237

BOARD DIPLOMA EXAMINATION, (C-16)
OCT/NOV—2018
DEE—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.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate $\int (\sec^2 x - e^x - \sin x) dx$.

2. Evaluate $\int \frac{e^{\tan^{-1} x}}{1+x^2} dx$.

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

4. Find the area enclosed by the parabola $y = x^2$, the x -axis and the lines $x = 3$ and $x = 5$.

5. Find $L\{e^{2t} - 4t^3 - 2\sin 3t - 3\cos 3t\}$.

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6. Find $L^{-1} \frac{2s-5}{s^2-4}$.

7. Find the value of a_0 in $f(x) = x^2$ in $(-\pi, \pi)$ by Fourier series.

8. Find the differential equation of the family of curves $y = A \cos 3x + B \sin 3x$, where A and B are arbitrary constants.

9. Solve $\frac{dy}{dx} = e^x y - x^2 e^{-y}$.

10. Solve $(D^2 - 5D + 6)y = 0$.

PART—B

10×5=50

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

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

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

11. (a) Evaluate $\int \sin 6x \cos 2x dx$. 5

(b) Evaluate $\int \sin^5 x \cos^3 x dx$. 5

12. (a) Evaluate $\int x^3 e^{3x} dx$. 5

(b) Show that $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx = \frac{\pi}{4}$. 5

13. (a) Find the volume of the solid obtained by revolving the ellipse $25x^2 + 16y^2 = 400$ about X-axis. 5

(b) Find the RMS value of $\sqrt{27 - 4x^2}$ from $x = 0$ to $x = 3$. 5

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14. (a) Calculate the approximate value of $\int_0^6 \frac{1}{x} dx$ by taking $n = 6$ using trapezoidal rule. 5

(b) Find $L(t \sin 2t)$. 5

15. (a) Find $L^{-1} \frac{s}{(s-3)^2 - 4}$. 5

(b) Using convolution theorem, find $L^{-1} \frac{1}{s(s^2 - 9)}$. 5

16. Obtain the Fourier series for the function $f(x) = x^2$ in the interval $(0, 2)$. 10

17. (a) Solve $\frac{dy}{dx} - \frac{y}{x} = \cot \frac{y}{x}$. 5

(b) Solve $\frac{dy}{dx} = \tan x \sec x$. 5

18. (a) Solve $(D^2 - 2D - 1)y = 4e^{3x}$. 5

(b) Solve $(D^2 - 4)y = x^2 - 3$. 5
