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CI6–EE–301/C16–CHPP–301/C16–PET–301

6237

BOARD DIPLOMA EXAMINATION, (C–16)

OCT/NOV—2018

DEEE—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 $(\sec^2 x \quad e^x \quad \sin x)\,dx$.

2. Evaluate $\dfrac{e^{\tan^{-1} x}}{1 \quad x^2}\,dx$.

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

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

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

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

7. Find the value of a_0 in $f(x) = x^2$ in $(-\ ,\ )$ 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 $\int \sin^5 \cos^3 \ d$. 5

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

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

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

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

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

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

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

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

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

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

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

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