C16-C/CM/IT–301

6222

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2021

DCE - 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 $\int \left(\cos ec^2 x + a^x + \cos x\right) dx$.

2. Evaluate $\int \frac{1}{5x+7} dx$.

3. Evaluate $\int_{-4}^{5} x^2 dx$.

4. Find the area enclosed by the curve $y = x^2$ by X – axis and the lines $x = 3$ and $x = 5$.

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

www.manaresults.co.in

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

7. Write down the formulae for finding Euler's constants of Fourier series in the interval $(0,2\pi)$.

8. Find the differential equation to the family of curves $y = Ae^{2x} + Be^{-2x}$ where A, B are arbitrary constants.

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

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

PART—B

10×5=50

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

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

11. *(a)* Evaluate $\int \frac{1}{x^2+8x+25}dx$.

(b) Evaluate $\int \sin^4 x \cos^3 x dx$.

12. *(a)* Evaluate $\int x^2 e^{2x} dx$.

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

www.manaresults.co.in

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

(b) Find the volume generated by the revolution of the circle $x^2+y^2=25$, about the X-axis.

14. *(a)* Obtain the value of $\int_0^1 \frac{dx}{1+x^2}$ using simpson's rule by dividing the interval (0, 1) into 4 equal parts.

(b) Find $L\left\{e^{2t}\cos 4t\right\}$.

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

(b) Find $L^{-1}\left[\frac{s+1}{s^2+2s+5}\right]$.

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

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

(b) Solve : $(6x+y+1)dx+(10y+x+1)dy=0$.

18. *(a)* Solve : $\left(D^2+4\right)y=\sin 3x$.

(b) Solve : $\left(D^2+D-6\right)y=e^x$.

★★★

www.manaresults.co.in