C-16-A/AA/AEI/BM/CH/
CHST/MET/MNG/TT-301

6201

BOARD DIPLOMA EXAMINATIONS

DMET-THIRD SEMESTER

SEPTEMBER/OCTOBER - 2020

ENGINEERING MATHEMATICS - II

Time: 3 hours Max. Marks: 80

PART – A **3 X 10 = 30**

Instructions: *1. Answer **all** questions.*
*2. Each question carries **Three** Marks.*
3. Answer should be brief and straight to the point and should not exceed Five simple sentences.

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

2. Evaluate $\int (2x - 3)^8\, dx$

3. Evaluate $\int_0^1 \frac{1}{1+x^2}\, dx$

4. Find the mean value of $f(x) = x^2 + 3$ on the interval [0,4]

5. Find the Laplace Transform of the function $7e^{2t} - 5t^4 + 6$

6. Find $L^{-1}\{\frac{s}{s^2+9}\}$

7. Find the value of a_0 in the Fourier Series expansion of $f(x) = |x|$ in $-\pi < x < \pi$

8. find the order and degree of the Differential Equation $\frac{d^2y}{d^2x} = \{ y + (\frac{dy}{dx})^6 \}^{\frac{1}{4}}$

[Cont..,

9. Solve $x^5\ dy + y^5\ dx = 0$

10. Solve $\frac{d^2y}{d^2x} - 5\frac{dy}{dx} + 6y = 0$

PART – B **5 X 10 = 50**

Instructions: *1. Answer any **Five** questions*
*2. Each question carries **TEN** Marks.*
3. Answer should be comprehensive and a criterion for valuation is the content but not the length of the answer.

11. a) Evaluate $\int sin^3x\ cos^6x\ dx$

b) Evaluate $\int \left(\frac{1}{4 + 5\cos x} \right) dx$

12. a) Evaluate $\int x\ tan^{-1}x\ dx$

b) Evaluate $\int_0^4 x\sqrt{x^2+1}\ dx$

13. a) Find the area bounded by the Parabola $y = x^2$, x-axis and the ordinate $x = 3$

b) Find the volume generated by revolving the area bounded by curve $y = x^3$ about y-axis, between the lines $y = 0$ and $y = 8$.

14. a) Evaluate $\int_0^1 x^3\ dx$ using Simpson's rule by taking n = 4.

b) Find L{t cos 3t}

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

b) using Convolution theorem Find $L^{-1}\{\frac{1}{s(s^2-4)}\}$

[Cont..,

16. Find the Fourier series for $f(x) = x^2$ in $-\pi < x < \pi$ and hence deduce that

$$\frac{1}{1^2}+\frac{1}{2^2}+\frac{1}{3^2}+ \ldots\ldots\infty = \frac{\pi^2}{6}$$

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

b) Solve $\frac{dy}{dx} + \frac{y}{x} = 1$

18. Solve the following differential equations

a) $(D^3 + D^2 + 4D + 4) y = 0$, Where $D = \frac{d}{dx}$

b) $(D^2 + 3D + 2) y = x$, Where $D = \frac{d}{dx}$