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**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  $L^{-1}\left\{\frac{s}{s^2+9}\right\}$
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  $\frac{d^2y}{dx^2} = \left\{ y + \left(\frac{dy}{dx}\right)^6 \right\}^{\frac{1}{4}}$

**[Cont...**

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

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

**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  $\int \sin^3 x \cos^6 x dx$

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  $L^{-1}\left\{\frac{s}{(s-4)^3}\right\}$

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

**[Cont.,**

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

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

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  $D = \frac{d}{dx}$

A.A.N.M & V.V.R.S.R POLYTECHNIC, GUDLAVALLERU, KRISHNA

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