STATE BOARD OF TECHNICAL EDUCATION AND TRAINING TELANGANA

401F

18EC/CM/A/C/CH/EE/EI/FW/M/MET/MNG/PKG/TT/PT/BM/ES
DIPLOMA EXAMINATION (C-18)
C-18-REGULAR-OCTOBER-2020
SEMESTER END EXAM
ADVANCED ENGINEERING MATHEMATICS
SEMESTER IV, PCODE: 6401

Time: 2 Hours [Total Marks: 40]

PART-A

Instructions: 1. Answer the following questions 8 X 1 = 8
2. Each question carries **ONE** mark

1. Find the particular integral of $(D^2 + 1)y = 17$
2. Find the value of a_0 for $f(x) = (\pi - x)$ in the interval $(0, \pi)$.
3. Find the Laplace Transform of $t^4 + e^{2t}$
4. Write the nature of the roots of auxiliary equation of Diifferential Equation.
   $(D^2 - 2D)y = 0$
5. Write the second shifting theorem Laplace transform.
6. Find $L\{e^{3t} - e^t - 3t\}$
7. Find $L^{-1}\left\{\frac{1}{s^2+5}\right\}$
8. Find $L^{-1}\left\{\frac{1}{(s-2)^3}\right\}$

PART-B

Instructions: 1. Answer the following questions 4 X 3 = 12
2. Each question carries **THREE** marks

9(a). Solve $(D^2+4)y=0$

----- OR ----

9(b). Find $L\left(\frac{\sin t}{t}\right)$

10(a). Find the value of b_n for the function f(x) = x which is expanded as sine series $(0, \pi)$

----- OR ----

10(b). Find $L^{-1}\left\{\frac{3s-12}{s^2+8}\right\}$

11(a). Find $L\left((1+t^2)^2\right)$

----- OR ----

11(b). Find $L(e^{-2t}(3\sin 4t - 4\cos 4t)$

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

----- OR ----

12(b). Find $L^{-1}\left\{\frac{e^{-3s}}{(s+4)^2}\right\}$ using second shifting theorem

PART-C

Instructions: 1. Answer the following questions
2. Each question carries **FIVE** marks

4 X 5 = 20

13(a). Solve $(D^3-9D^2+23D-15)Y=0$

----- OR ----

13(b). Find $L\{t^2 Cos2t\}$

14(a). Find the Fourier series expansion of $f(x)=x,\ 0\le x\le 2\pi$.

----- OR ----

14(b). Find $L^{-1}\left[\frac{3s-2}{s^2-2s+5}\right]$

15(a). Evaluate $\int_0^\infty te^{-2t}\ Sintdt$

----- OR ----

15(b). Evaluate $\int_0^\infty te^{-2t}costdt$ using Laplace transform

16(a). Using Convolution Theorem, find $L^{-1}\left\{\frac{s}{(s^2+1)(s^2+4)}\right\}$

----- OR ----

16(b). Find the Inverse laplaceTransform of $\frac{s^2}{(s+1)(s+2)(s+3)}$