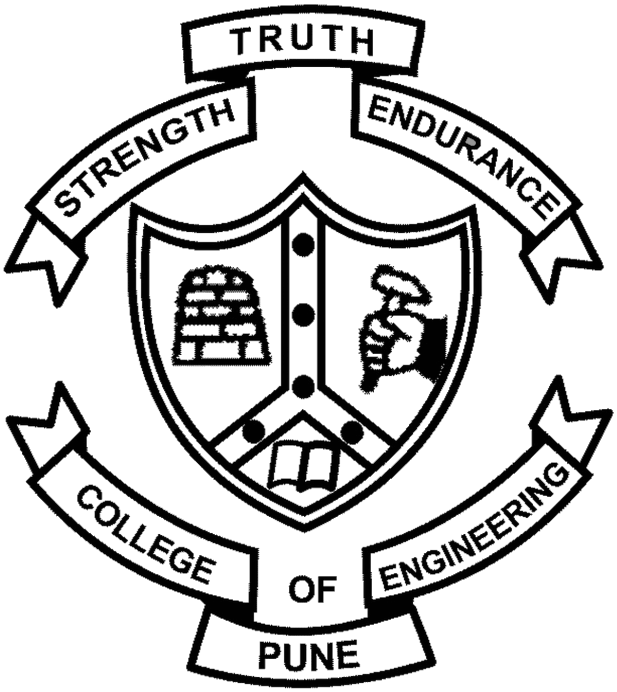
# DTL Assignment 3 - Include Graphics and Tables

Avdhut Kamble




January 18, 2023

# 1 LAUC Syllabus

## 1.1 Unit 1

1. Linear Algebra
2. Vector Spaces
3. Differential Equations

## 1.2 Unit 2

1. Laplace Inverse Transform
2. Transfer Function
3. Time Domain Analysis

## 1.3 Unit 3

1. Functions of several variables
2. Level curves and level surfaces
3. Partial and directional derivatives

# College of Engineering, Pune.

B.Tech II Year

November 2022, Odd Semester

**Linear Algebra and Uni-variate Calculus**

**TEST - 1**

Duration-1.5 hours

Marks 30

**Q.1) Solve the following:**

(a)$3x(xy-2)dx+(x^3+2y)dy=0$ [CO 2] [2]

(b)$(2\cos y+4x^2)dx-x\sin ydy==0$ [CO 2] [3]

Q.2) Prove the following matrices equal if $AB=A^T.B^T$. [CO 1] [1]

$$B_{m\times n}=\begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix}$$

$$A_{m\times n}=\begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix}$$

**Q.3)State whether the following differential equations are linear or non linear ,justify and solve:**

(a)$xy'+2y=\frac{e^{3x}}{x}, x>0 with y(1)=1+\frac{e^3}{3}$. [CO 2] [3]

(b)$x^2y\frac{dy}{dx}-xy^2=1$ [CO 2] [3]

Q.4) If $x^2$ and 1 are solutions of $yy''-xy'=0$ then so is any linear combination of these. State true or false and justify. [CO 4] [2]

Q.5) Find a linear ordinary differential equation for which the function $e^{-x}\cos 2x$ and $e^{-x}\sin 2x$ are linearly independent solutions. [CO 2] [3]

Q.6) Solve the given equation of form $AX=B$

$$A=\begin{pmatrix}1 & 1 & 1\\ 1 & 2 & 3\\ 1 & 4 & 7\end{pmatrix}, X=\begin{pmatrix}x\\ y\\ z\end{pmatrix} B=\begin{pmatrix}6\\ 14\\ 30\end{pmatrix}$$

Q.7) Show that the following matrix is diagonalizable:

$$A = \begin{pmatrix} 1 & 0 & 1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{pmatrix}$$

## 2 Table from raw values

Table 1: Price of stationary

| Sr. no. | Item | Price |
|---|---|---|
| 1 | Pencil | 20 |
| 2 | Pen | 40 |
| 3 | Notebook | 50 |
| 4 | Writing Pad | 60 |
| 5 | Bag | 10 |

## 3 Include table from CSV

| Name | Age | College |
|---|---|---|
| 142203001 | Avdhut | SY 5 |
| 142203002 | Test 1 | SY 6 |
| 142203003 | Test2 | SY 7 |
| 142203004 | Test 3 | SY 8 |
| 142203005 | Test 4 | SY 9 |
| 142203006 | Test 5 | SY 10 |
| 142203007 | Test 6 | SY 11 |
| 142203008 | Test 7 | SY 12 |
| 142203009 | Test 8 | SY 13 |
| 142203010 | Test 9 | SY 14 |
| 142203011 | Test 10 | SY 15 |
| 142203012 | Test 11 | SY 16 |
| 142203013 | Test 12 | SY 17 |
| 142203014 | Test 13 | SY 18 |
| 142203015 | Test 14 | SY 19 |
| 142203016 | Test 15 | SY 20 |
| 142203017 | Test 16 | SY 21 |
| 142203018 | Test 17 | SY 22 |