

Hall Ticket Number :

R-19

Code: 19A311T

I B.Tech. I Semester Supplementary Examinations November 2023

### Engineering Graphics – I

( Common to CE & ME)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks )

\*\*\*\*\*

#### UNIT-I

- |  | Marks | CO  | BL |
|--|-------|-----|----|
| 1. a) Inscribe an ellipse in a parallelogram having sides 150 mm and 100 mm long and an included angle of 120°.  | 7M    | CO1 | L6 |
| b) A point P is 40 mm and 60 mm respectively from two straight lines which are at right angles to each other. Draw the rectangular hyperbola from p within 15mm distance from each line. | 7M    | CO1 | L6 |

OR

- |   |     |     |    |
|---|-----|-----|----|
| 2. Construct a rectangular hyperbola, when a point P on it is at a distance of 18mm and 34mm from two asymptotes. Also draw a tangent to a curve at a point 20mm from an asymptote. | 14M | CO1 | L6 |
|---|-----|-----|----|

#### UNIT-II

- |   |     |     |    |
|---|-----|-----|----|
| 3. Draw a hypocycloid of a circle of 40mm diameter, which rolls inside another circle of 160mm diameter, for one revolution counter clockwise. Draw a tangent & a normal to it at a point 65mm from the center of the directing circle. | 14M | CO2 | L3 |
|---|-----|-----|----|

OR

- |  |  |  |  |
|--|--|--|--|
| 4. Construct a parabola, with the distance of the focus from the directrix as 50 mm, also draw normal and tangent to the curve at a point 40 from the directrix. |  |  |  |
|--|--|--|--|

#### UNIT-III

- |   |     |     |    |
|---|-----|-----|----|
| 5. A line AB, 65mm long, has its end A 20mm above the H.P. and 25mm in front of the V.P. The end B is 40mm above the H.P. and 65mm in front of the V.P. Draw the projections of AB and show its inclinations with the H.P. and the V.P. | 14M | CO3 | L3 |
|---|-----|-----|----|

OR

- |  |     |     |    |
|--|-----|-----|----|
| 6. Draw the projections of the following points on the same ground line, keeping the projections 25mm apart.<br>A, in the H.P & 20mm, behind the V.P<br>B, 40mm above the H.P & 25mm in front of the V.P.<br>C, in the V.P & 40mm above the H.P.<br>D, 25mm below the H.P & 25mm behind the V.P.<br>E, 15mm above the H.P & 50mm behind the V.P.<br>F, 40mm below the H.P & 25mm in front of the V.P.<br>G, in both the H.P & the V.P. | 14M | CO3 | L3 |
|--|-----|-----|----|

#### UNIT-IV

- |  |     |     |    |
|--|-----|-----|----|
| 7. A regular pentagon of 25mm side has one side on the ground. Its plane is inclined at 45° to the HP and perpendicular to the VP. Draw its projections. | 14M | CO4 | L3 |
|--|-----|-----|----|

OR

- |  |     |     |    |
|--|-----|-----|----|
| 8. A rhombus has its diagonals 100mm and 60mm long. Draw the projections of the rhombus, when it is so placed that its top view appears to be a square of diagonal 60mm long and the vertical plane through the longer diagonal makes 30° with VP. | 14M | CO4 | L3 |
|--|-----|-----|----|

#### UNIT-V

- |   |     |     |    |
|---|-----|-----|----|
| 9. Draw the projections of a cone, base 75mm diameter and axis 100mm lying on the HP on one of its generators with the axis parallel to the VP. | 14M | CO5 | L3 |
|---|-----|-----|----|

OR

- |   |     |     |    |
|---|-----|-----|----|
| 10. A square prism, base 40mm side and height 65mm has its axis inclined at 45° to the HP and has an edge of its base, on the HP and inclined at 30° to the VP. Draw its Projections. | 14M | CO5 | L3 |
|---|-----|-----|----|

\*\*\*

Hall Ticket Number :

--	--	--	--	--	--	--	--	--	--	--

R-19

Code: 19A511T

I B.Tech. I Semester Supplementary Examinations November 2023

## Problem Solving and C Programming

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks )

\*\*\*\*\*

Marks

### UNIT-I

1. a) What is a variable? What are the rules for declaring variables? Give examples of valid and invalid variables 8M  
b) What is an algorithm? Describe the characteristics of an Algorithm 6M

OR

2. a) What is data type? Explain basic data types and their sizes used in a C Language 7M  
b) Draw the Flow Chart for finding a number is prime or not. 7M

### UNIT-II

3. a) Write a C program to generate multiplication table 6M  
b) Explain in detail about Control Statements? 8M

OR

4. a) Write a program in C to search for an element using linear search technique 7M  
b) Explain about selection sort with suitable example. 7M

### UNIT-III

5. a) Explain any five string manipulation library functions with examples. 9M  
b) What is mean by recursion? Explain the advantages of recursive function. 5M

OR

6. What is function parameter? Explain different types of parameters in C functions. 14M

### UNIT-IV

7. What is dynamic memory allocation? Write and explain the different dynamic memory allocation functions in C. 14M

OR

8. a) What is a pointer? Explain how the pointer variable declared and initialized. 7M  
b) Write advantages and disadvantages of pointers 7M

### UNIT-V

9. a) Explain how the structure variable passed as a parameter to a function with example. 7M  
b) Write a C program to read and display a text from the file. 7M

OR

10. a) What is a self-referential structure? Give an example. 5M  
b) What is a file? Explain how the file open and file close functions 9M

\*\*\*

Important Note: 1. On completing your answers. Compulsorily draw diagonal cross line on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 32+8=40, will be treated as malpractice.

Hall Ticket Number : 

--	--	--	--	--	--	--	--	--	--

**R-19****Code: 19AC11T**

I B.Tech. I Semester Supplementary Examinations November 2023

**Algebra and Calculus**

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

\*\*\*\*\*

Marks CO BL

**UNIT-I**

1. a) If  $\lambda$  is an Eigen value of a non-singular matrix  $A$ , then  $\frac{1}{\lambda}$  is an Eigen value

of  $A^{-1}$ 

7M CO1 L2

- b) Find the Eigen values of  $A = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 2 & 2 \\ 0 & 0 & -2 \end{bmatrix}$

7M CO1 L3

**OR**

2. a) Find the rank of  $A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 4 \\ 7 & 10 & 12 \end{bmatrix}$

7M CO1 L3

- b) Solve  $x + y + z = 4, 2x + 5y - 2z = 3, x + 7y - 7z = 5$

7M CO1 L3

**UNIT-II**

3. Reduce the quadratic form  $2x^2 + 2y^2 + 2z^2 - 2xy - 2yz + 2zx$  to canonical form by using orthogonal transformation.

14M CO2 L3

**OR**

4. Diagonalize the matrix  $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$

14M CO2 L2

**UNIT-III**

5. a) If  $z = u^2 + v^2$  and  $u = at^2, v = 2at$ , then find  $\frac{dz}{dt}$

7M CO3 L3

- b) Evaluate  $\frac{\partial z}{\partial x}$  and  $\frac{\partial z}{\partial y}$ , if  $z = \log(x^2 + y^2)$

7M CO3 L3

**OR**

6. Find the maximum and minimum values of  $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$

14M CO3 L3

**UNIT-IV**

7. Trace the curve  $r = a \cos 2\theta$

14M CO4 L4

**OR**

8. a) Expand  $\sin x$  in powers of  $(x - \frac{f}{2})$ .

7M CO4 L3

- b) Using Maclaurin's series, expand  $\log(1+x)$  in powers of  $x$ .

7M CO4 L3

Important Note: 1. On completing your answers. Compulsorily draw diagonal cross line on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 32+8=40, will be treated as malpractice.

## UNIT-V

9. Show that  $\int_0^{\infty} x^4 e^{-x^2} dx = \frac{3\sqrt{f}}{8}$

14M CO5 L3

OR

10. a) Evaluate  $\int_0^2 \int_0^3 xy dx dy$

7M CO5 L3

b) Evaluate  $\int_0^2 \int_0^x y dy dx$

7M CO5 L3

\*\*\*

Hall Ticket Number :

R-19

Code: 19AC13T

I B.Tech. I Semester Supplementary Examinations November 2023

**Chemistry of Materials**

(Common to CE &amp; ME)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

\*\*\*\*\*

Marks CO BL

**UNIT-I**

1. With the help of neat diagram, explain zeolite process for softening of the water and give its advantages

14M CO1 L4

**OR**

2. a) Explain the principle for osmosis? How it is used in water purification  
b) Describe the desalination of brackish water by electro dialysis method

7M CO1 L2

7M CO1 L2

**UNIT-II**

3. a) Define secondary cells? Describe the construction of Ni-Cd cell and its applications

7M CO2 L1

- b) Discuss the construction and working principle of Li-MnO<sub>2</sub> batteries

7M CO2 L3

**OR**

4. Explain the principle and construction of lead acid cell with its application

14M CO2 L2

**UNIT-III**

5. a) Explain the constituents and functions of organic coatings

7M CO3 L2

- b) List out the differences between anodic coating and cathodic coating

7M CO3 L1

**OR**

6. a) Describe the various factors influencing corrosion

7M CO3 L2

- b) Differentiate metallic coating and organic coating

7M CO3 L3

**UNIT-IV**

7. a) Explain the preparation of PVC and polyphosphazene polymers

7M CO4 L2

- b) Define knocking? Write a short notes on octane values and cetane value

7M CO4 L1

**OR**

8. Elaborate the mechanism involved in the preparation of Bakelite and list out properties and applications of Bakelite

14M CO4 L3

**UNIT-V**

9. Describe the characterizations of nanomaterial by BET method

14M CO5 L2

**OR**

10. a) What is meant by nanomaterial explain some important applications

7M CO5 L1

- b) Discuss any one synthetic methods of nanomaterials

7M CO5 L2

\*\*\*