

Hall Ticket Number :																			
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**R-20**

**Code: 20A312T**

I B.Tech. I Semester Supplementary Examinations July 2023

**Engineering Drawing**  
(Common to CE, EEE and ECE)

Max. Marks: 70

Time: 3 Hours

Answer *five full* questions by choosing one question from each unit (5 x 14 = 70 Marks)

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Marks

**UNIT-I**

1. Construct a parabola when the distance between the focus and directrix is 50mm. Also draw the tangent and normal to any point on the curve. 14M

**OR**

2. Construct an epicycloid of a circle 60 mm diameter which rolls outside of another circle of 120 mm diameter for one revolution. Draw tangent and normal to any point on the curve. 14M

**UNIT-II**

3. A line NS, 80mm long has its end N, 10mm above the HP and 15mm in front of the VP. The other end S is 65mm above the HP and 50mm in front of the VP. Draw the projections of the line and find its true inclinations with the HP and VP. 14M

**OR**

4. Draw the projections of the following points on the same ground line, keeping the projections 30mm apart. 14M
- i. A, in the H.P & 30mm, behind the V.P
  - ii. B, 30mm above the H.P & 15mm in front of the V.P.
  - iii. C, in the V.P & 50mm above the H.P.
  - iv. D, 30mm below the H.P & 35mm behind the V.P.
  - v. E, 25mm above the H.P & 65mm behind the V.P.
  - vi. F, 45mm below the H.P & 35mm in front of the V.P.
  - vii. G, in both the H.P & the V.P.

**UNIT-III**

5. 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

**OR**

6. A semi-circular lamina of 64mm diameter has its straight edge in VP and inclined at an angle of  $45^\circ$  to HP. The surface of the lamina makes an angle of  $30^\circ$  with VP. Draw the projections 14M

**UNIT-IV**

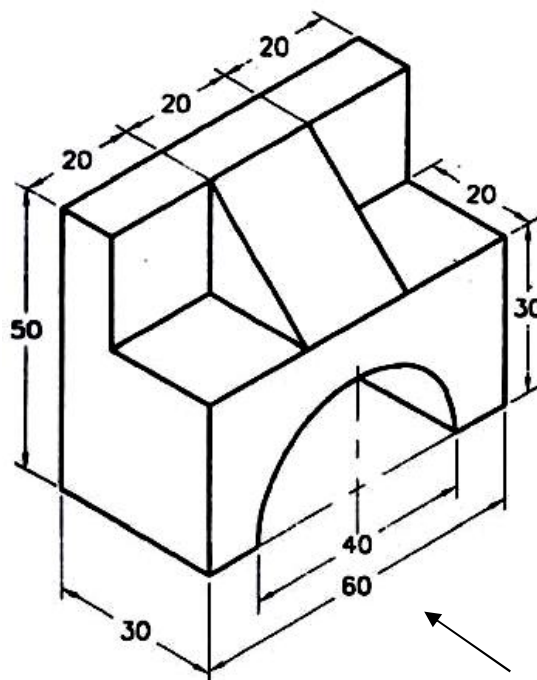
7. A hexagonal pyramid, base 25mm side and axis 50mm long, has an edge of its base on the ground. Its axis inclined  $30^\circ$  to the ground and parallel to the V.P. Draw its projections 14M

**OR**

8. Draw the projections of a pentagonal prism, base 25mm side and axis 50mm long, resting on one of its rectangular faces on the H.P with the axis inclined  $45^\circ$  to the V.P. 14M

**UNIT-V**

9. Draw the top view, front view and left side view for the object shown below.



**OR**

10. Draw the isometric view of hexagonal prism, with side of base 25mm and axis 60mm long. The prism is resting on its base on HP, with an edge of the base parallel to VP. 14M

\*\*\* End \*\*\*

Hall Ticket Number :										
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<b>R-20</b>
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**Code: 20A511T**

I B.Tech. I Semester Supplementary Examinations July 2023

**Problem Solving through C Programming**

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. In Part-A, each question carries **Two marks**.  
3. Answer **ALL** the questions in **Part-A** and **Part-B**

**PART-A**

(Compulsory question)

- 1. Answer the following ( 5 X 2 = 10M )**
- |   | <b>CO</b> | <b>BL</b> |
|---|-----------|-----------|
| a) Summarize the basic Datatypes supported in C Programming.    | CO1       | L2        |
| b) Differentiate break and continue statements.                 | CO2       | L2        |
| c) Interpret the declaration of a header file with < > and “ ”. | CO3       | L2        |
| d) Define Pointer.  | CO4       | L2        |
| e) Differentiate text files and binary files.                   | CO5       | L3        |

**PART-B**

Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

**UNIT-I**

2. Discuss the types of operators in C programming. 12M 1 L2

**OR**

3. a) Define a variable and list the rules for variable declaration. 6M 1 L2  
b) Differentiate global and local variables with examples. 6M 1 L2

**UNIT-II**

4. a) Model a C program to produce the Transpose of a given matrix. 6M 2 L3  
b) Apply selection sort on the following list of elements  
30, 60, 80, 10, 50, 90, 70, 20 6M 2 L3

**OR**

5. a) Discuss the conditional control statements in C programming. 6M 2 L3  
b) Model a C program for Linear search. 6M 2 L2

**UNIT-III**

6. a) Analyze the storage classes in C. 8M 3 L4  
 b) Describe the built-in functions strcmp(), strcpy(). 4M 3 L2

**OR**

7. a) Model a C program to find the GCD of two integers using functions. 6M 3 L5  
 b) Describe actual and formal parameters in C programming. 6M 3 L2

**UNIT-IV**

8. a) Differentiate call by value and call by reference. 6M 4 L3  
 b) Develop a C program using the predefined functions malloc, and realloc. 6M 4 L6

**OR**

9. a) Differentiate static and dynamic memory allocation. 4M 4 L2  
 b) Apply bubble Sort over the list of integers using pointers 8M 4 L3

**UNIT-V**

10. a) Demonstrate the accessing members of a structure using variable. 6M 5 L3  
 b) Describe the file opening modes of operation. 6M 5 L2

**OR**

11. a) Develop a c program to read and write data into a text file. 6M 5 L5  
 b) Demonstrate the passing array of structures to functions. 6M 5 L4

**\*\*\*END\*\*\***

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**R-20**

**Code: 20AC11T**

I B.Tech. I Semester Supplementary Examinations July 2023

**Algebra and Calculus**  
(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. In Part-A, each question carries **Two mark**.  
 3. Answer **ALL** the questions in **Part-A** and **Part-B**

**PART-A**

(Compulsory question)

1. Answer ALL the following short answer questions ( 5 X 2 = 10M )
- |  | CO | BL |
|--|----|----|
| a) The rank of the matrix $\begin{bmatrix} 1 & -1 & 1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{bmatrix}$ is .....                              | 1  | 3  |
| b) Using Cayley-Hamilton theorem, the value of $A^4 - 4A^3 - 5A^2 - A + 2I$ when $A = \begin{bmatrix} 1 & 2 \\ 4 & 2 \end{bmatrix}$ is | 2  | 3  |
| c) Expand $e^x$ by Maclaurin's series  | 3  | 2  |
| d) Evaluate $\int \int_{x^2+y^2 \leq 1} x^2 y^3 dx dy$ over the region $0 \leq x \leq 1$ and $1 \leq y \leq 2$                         | 4  | 3  |
| e) Find the value of $\Gamma(-1/2)$  | 5  | 3  |

**PART-B**

Answer five questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

Marks CO BL

**UNIT-I**

2. a) Reduce the following matrix into Echelon form and hence find its rank.
- |   |    |   |   |
|---|----|---|---|
| $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$ | 6M | 1 | 3 |
| b) Test for consistency and solve   |    |   |   |
| $4x - 2y + 6z = 8$  |    |   |   |
| $x + y - 3z = -1$   |    |   |   |
| $15x - 3y + 9z = 21$  | 6M | 1 | 3 |

**OR**

3. Find the eigenvalues and eigenvectors of the matrix
- |   |     |   |   |
|---|-----|---|---|
| $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$ | 12M | 2 | 3 |
|---|-----|---|---|

<b>UNIT-II</b>
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4. Find the characteristic equations of the matrix;  $\begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$   
 And hence compute  $A^{-1}$ . Also find the matrix represent ed by  
 $A_8 - \frac{1}{5}A_7 + \frac{3}{7}A_6 - \frac{1}{3}A_5 + A_4 - \frac{1}{2}A_3 + \frac{1}{3}A_2 - \frac{1}{2}A + I.$

12M 2 3

OR

5. Find the matrix **P** which transforms the matrix  
 $\begin{bmatrix} 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$   
 To the diagonal form. Hence calculate  $A^4$

12M 2 3

<b>UNIT-III</b>
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6. a) Use Maclaurin's series, to prove that  
 $\log(1 + \sin x) = x - \frac{x^2}{2} + \frac{x^3}{6} - \frac{x^4}{12} + \dots$
- b) Discuss the maxima and minima of  
 $f(x, y) = x^3y^2(1 - x - y)$

6M 3 2

6M 3 2

OR

7. a) If  $x = r \sin \theta \cos \phi, y = r \sin \theta \sin \phi, z = r \cos \theta$  then show that  
 $\frac{\partial(x, y, z)}{\partial(r, \theta, \phi)} = r^2 \sin \theta$
- b) Find the volume of the greatest rectangular parallelepiped that  
 can be inscribed in the ellipsoid  $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$

6M 3 3

6M 3 3

<b>UNIT-IV</b>
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8. Evaluate  $\int \int r^3 dr d\theta$  over the area bounded between the circles  
 $r = 2 \cos \theta$  &  $r = 4 \cos \theta$
9. Evaluate  $\int_{-1}^1 \int_0^2 \int_{x-z}^{x+z} (x + y + z) dx dy dz$

12M 4 3

12M

12M 12M 4 3

<b>UNIT-V</b>
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10. Express the following integrals in terms of gamma function  
 (i)  $\int_0^1 \left( \frac{1}{\sqrt{1-x^4}} \right) dx$  (ii)  $\int_0^{\pi/2} \sqrt{\tan \theta} d\theta$
11. Prove that  $\int_0^1 \left( \frac{x^2}{\sqrt{1-x^4}} \right) dx \times \int_0^1 \left( \frac{1}{\sqrt{1+x^4}} \right) dx = \frac{\pi}{4\sqrt{2}}$  using gamma and beta functions.

12M 5 2

12M 5 3

\*\*\* End \*\*\*