| Hall Ticket Number : | | | | | | | | | | |
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**R-20**

**Code: 20AC15T**

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

# Communicative English

(Common to CE, ME, CSE, AI&DS, CSE(AI) and CSE(DS))

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 )**

| | | CO | BL |
|---|---|---|---|
| 1. | Answer ***all*** the following short answer questions ( 5 X 2 = 10M ) | | |
| a) | What emotions did Hazlitt's son express when he was moved to a new school? | **CO1** | **L2** |
| b) | What is the poem "The Brook" about? | **CO2** | **L2** |
| c) | At what age the prince 'Dimitri' came into the throne of 'Kedaria'? | **CO1** | **L2** |
| d) | When was Mohammad Yunus awarded 'Nobel Peace Prize'? | **CO1** | **L2** |
| e) | What is the name of the training academy established by Mrinalini Sarabhai? | **CO2** | **L1** |

## PART-B

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

| | | Marks | CO | BL |
|---|---|---|---|---|
| | **UNIT-I** | | | |
| 2. | What does the author say about despising people? What justification does he provide for his advice? | 12M | CO1 | L2 |
| | **OR** | | | |
| 3. a) | **Change the following statements into questions:**<br>i) My grandparents live with my uncle.<br>ii) He had a strange experience yesterday.<br>iii) Her mother has bought a nice gift for her.<br>iv) Jack has bought an interesting book from the library.<br>v) They have accepted the invitation.<br>vi) My neighbor is a kind-hearted lady. | 6M | CO3 | L4 |
| b) | **Identify the Parts of Speech of the underlined words in the following sentences:**<br>i) The car moved <u>slowly</u> around the <u>track.</u><br>ii) <u>He</u> walked <u>through</u> the park.<br>iii) They waited anxiously <u>for</u> the game to <u>begin.</u> | 6M | CO3 | L4 |
| | **UNIT-II** | | | |
| 4. | How has the poet drawn parallelism between the journey of the brook and the life of man? | 12M | CO2 | L2 |

**OR**

5. **Fill in the blanks with the appropriate article or no article:**
   i) This is ____ interesting book.
   ii) My father is ____ police office.
   iii) She picked me at ____ airport.
   iv) Experts say that ____coffee is good for health.
   v) They are having ____ party next week.
   vi) He is wearing ____ black suit to the wedding.
   vii) I am looking for ____ job in marketing.
   viii) He climbed ____ Mount Everest.
   ix) The doctor prescribed ____medicine for my headache.
   x) We bought some cheese and jam._____cheese was delicious.
   xi) Our library has three copies of ____Mahabharata.
   xii) This is ____ great service to humanity. 12M CO4 L3

**UNIT-III**

6. How does Dimitri escape himself from the death trap? 12M CO1 L3

**OR**

7. Write a detailed note on Summarizing Skills. 12M CO5 L4

**UNIT-IV**

8. Why did Mohammed Yunus establish Grameen Bank and how it helped the rural women in Bangladesh? 12M CO2 L1

**OR**

9. **Develop the following hints into a meaningful passage.**
   Without hard work - no knowledge - all things – difficult initially – climbing mountains –get arduous training live in camps – minimum food – more hardships – risking life – lesson – no achievement without self –sacrifice – adequate – preparation – high achievers – overcome more difficulties. 12M CO5 L4

**UNIT-V**

10. Narrate the inspiring story of Mrinalini Sarabhai and describe the left by her for future generation. 12M CO4 L3

**OR**

11. Write a letter to the District Magistrate, drawing his attention to the nuisance of loud speakers in your locality. 12M CO5 L4

*** End ***

| Hall Ticket Number : | | | | | | | | | | |
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**R-20**

**Code: 20A311T**

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

# Engineering Graphics-I

(Mechanical Engineering)

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) | Divide a straight line AB of length 50 mm, into 9 equal parts. | 7M | CO1 | L1 |
| | b) | Bisect an angle AOB given<br>i. Angle AOB = 450.<br>ii. Angle AOB = 1250. | 7M | CO1 | L1 |
| | | **OR** | | | |
| 2. | | Draw an ellipse having major axis is equal to 100 mm and the minor axis is equal to 70 mm. Use the concentric circle method | 14M | CO1 | L2 |
| | | **UNIT–II** | | | |
| 3. | | Construct a cycloid having a rolling (generating) circle diameter as 50mm. Draw a normal and a tangent to a curve at a point 35mm above the base line | 14M | CO2 | L1 |
| | | **OR** | | | |
| 4. | | A coin of 40mm diameter rolls over a horizontal table without Slipping. A point on the circumference of the coin is in contact with the table surface in the beginning and after one complete revolution. Draw the path traced by the point. | 14M | CO2 | L1 |
| | | **UNIT–III** | | | |
| 5. | | A point A is 20mm above the HP and 50mm in front of the VP. Another point B is 40mm below the HP and 15mm behind the VP. The distance between the projectors of the points, measured parallel to xy, is 75mm. Draw the projections of the points. Draw lines joining their FVs and TVs | 14M | CO3 | L2 |
| | | **OR** | | | |
| 6. | | A line AB of 100mm length is inclined at an angle of $30^0$ to HP and $45^0$ to VP. The point A is 15mm above HP and 20mm in front of VP. Draw the projections of the line. | 14M | CO3 | L3 |
| | | **UNIT–IV** | | | |
| 7. | | A Regular pentagon of 25mm side has one side on the ground. Its plane is inclined at $45^0$ to the HP and perpendicular to the VP. Draw its projections | 14M | CO4 | L2 |
| | | **OR** | | | |
| 8. | | A regular pentagonal lamina of 30mm sides has one edge in HP and inclined at an angle of 30° to VP. Draw its projections when its surface is inclined at 45° to HP. | 14M | CO4 | L3 |
| | | **UNIT–V** | | | |
| 9. | | A Line AB, 50mm long is inclined at $30^0$ to the HP and its top view makes angle of $60^0$ with the VP. Draw its projection using auxiliary plane method. | 14M | CO5 | L2 |
| | | **OR** | | | |
| 10. | | A line AB of 70mm length has its end A at 20mm above HP and 25mm infront of VP. The line is inclined at $30^0$ to HP and $45^0$ to VP. Draw the projections by the auxiliary plane method. | 14M | CO5 | L2 |

***END***

| Hall Ticket Number : | | | | | | | | | | |
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**R-20**

**Code: 20AC14T**

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

# Engineering Chemistry

(Common to CE & ME)

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 )**

| | | CO | BL |
|---|---|---|---|
| 1. | Answer ***all*** the following short answer questions ( 5 X 2 = 10M ) | | |
| a) | Distinguish between hard water and soft water | CO1 | L2 |
| b) | What are fuel cells? Give examples | CO2 | L1 |
| c) | How is vinyl chloride typically prepared for the synthesis of polyvinyl chloride? | CO3 | L1 |
| d) | What are the essential constituents of cement? | CO4 | L1 |
| e) | What is a sol in the context of the Sol-Gel method? | CO5 | L1 |

## 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 ion exchange process for water softening with a neat diagram. | 12M | CO1 | L4 |
| | | **OR** | | | |
| 3. | | What is potable water? What are the specifications of potable water? | 12M | CO1 | L2 |
| | | **UNIT-II** | | | |
| 4. | a) | Describe the construction and working principle of a galvanic cell. Give their electrode and net cell reactions? | 6M | CO2 | L2 |
| | b) | Mention the electrochemical conventions of an electrochemical cell | 6M | CO2 | L1 |
| | | **OR** | | | |
| 5. | | Define Dry corrosion. Discuss its mechanism with an example | 12M | CO2 | L2 |
| | | **UNIT-III** | | | |
| 6. | a) | Explain the differences between higher and lower calorific values of a fuel. | 6M | CO3 | L2 |
| | b) | Calculate the gross and net calorific value of coal having the following compositions Carbon=85%, hydrogen=8%, sulphur=1%, nitrogen=2%, ash-4%, latent heat of steam=587 cal/g. | 6M | CO3 | L3 |
| | | **OR** | | | |
| 7. | | Discuss the preparation, properties and applications of Bakelite | 12M | CO3 | L2 |
| | | **UNIT-IV** | | | |
| 8. | | Describe the classification of lubricants based on their natural state. Provide examples for each type. | 12M | CO4 | L2 |
| | | **OR** | | | |
| 9. | | Describe the distinguishing features between particle-reinforced composites, fiber-reinforced composites, and structural composites. | 12M | CO4 | L2 |
| | | **UNIT-V** | | | |
| 10. | | Demonstrate how XRD can be used to determine the crystal structure and crystallographic orientation of nanoparticles. | 12M | CO5 | L3 |
| | | **OR** | | | |
| 11. | a) | Describe the classification of Nanomaterials giving examples to each type | 6M | CO5 | L2 |
| | b) | What are the advantages of sol-gel process of synthesizing nanomaterials | 6M | CO5 | L2 |

*** End ***

| Hall Ticket Number : | | | | | | | | | | |
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**R-20**

**Code: 20A511T**

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

# Problem Solving through C Programming

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

*********

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 )**

| | | CO | BL |
|---|---|---|---|
| 1. | Answer ***all*** the following short answer questions ( 5 X 2 = 10M ) | | |
| a) | What is the size of integer data type? | CO1 | L1 |
| b) | Differentiate do-while and while statements. | CO2 | L2 |
| c) | List the various storage classes in C. | CO3 | L1 |
| d) | What is a void pointer? | CO4 | L1 |
| e) | Give various modes of opening a file. | CO5 | L1 |

## PART-B

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

| | | Marks | CO | BL |
|---|---|---|---|---|
| | **UNIT-I** | | | |
| 2. a) | What are the various steps to solve a problem? Explain them by taking an example. | 6M | CO1 | L1,L2 |
| b) | Draw a flow chart to find the largest of three numbers in C. | 6M | CO1 | L3 |
| | **OR** | | | |
| 3. a) | Explain the Structure of C program. | 6M | CO1 | L2,L3 |
| b) | How many keywords does C Language support? Explain. | 6M | CO1 | L1,L2 |
| | **UNIT-II** | | | |
| 4. a) | Explain Nested if else statements with an example. | 6M | CO2 | L2 |
| b) | Write a C program to find the smallest number among three numbers. | 6M | CO2 | L1,L3 |
| | **OR** | | | |
| 5. a) | Describe about two dimensional arrays, initializing the two dimensional arrays and accessing elements in such arrays. | 6M | CO2 | L2 |
| b) | Write a program to find an element present in a given array by using any one search technique. | 6M | CO2 | L1,L3 |

## UNIT-III

| | | | | | |
|---|---|---|---|---|---|
| 6. | | Explain briefly about string handling functions in C with examples. | 12M | CO3 | L2 |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 7. | a) | Differentiate call by value and call by reference with example | 6M | CO3 | L1,L3 |
| | b) | Illustrate the concept of recursion. | 6M | CO3 | L2 |

## UNIT-IV

| | | | | | |
|---|---|---|---|---|---|
| 8. | a) | Define a pointer. How to initialize and declare pointer variables? Explain the same with examples | 6M | CO4 | L1,L2 |
| | b) | Explain how to pass one dimensional arrays to functions | 6M | CO4 | L2 |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 9. | a) | Write advantages and disadvantages of pointers | 6M | CO4 | L1,L3 |
| | b) | Write a C program to find the greatest and smallest element in an array using pointers. | 6M | CO4 | L1,L3 |

## UNIT-V

| | | | | | |
|---|---|---|---|---|---|
| 10. | a) | Differentiate between structures and unions, and write the syntax for nested structures | 6M | CO5 | L1,L2 |
| | b) | What is an enumerated data type? Explain with example. | 6M | CO5 | L1,L2 |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 11. | a) | Explain the syntax for Nested structures. Describe Nested structures with an example. | 6M | CO5 | L2 |
| | b) | Write a C program to reverse the contents of a file | 6M | CO5 | L1,L2 |

*** End ***

| Hall Ticket Number : | | | | | | | | | | |
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**R-20**

**Code: 20AC11T**

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

# Algebra and Calculus

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

*********

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 ***all*** the following short answer questions ( 5 X 2 = 10M ) CO BL

a) Define the rank of the Matrix CO1 L1

b) Define index and signature of a Quadratic form CO2 L1

c) If $x = r\cos\theta, y = r\sin\theta$ then find $\frac{\partial(x,y)}{\partial(r,\theta)}$ CO3 L3

d) Evaluate $\int_0^1 \int_0^2 \int_0^2 xy^2z \, dz \, dy \, dx$ CO4 L5

e) Define Gamma function CO5 L1

## 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 matrix to Echelon form and find its rank

$$\begin{bmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$$ 6M CO1 L3

b) Investigate the values of $\lambda$ and $\mu$ so that the equations $2x+3y+5z=9$, $7x+3y-2z=8$, $2x+3y+\lambda z=\mu$, have (i) no solution, (ii) a unique solution and (iii) an infinite number of solutions. 6M CO1 L3

**OR**

3. Find for what value of $\lambda$ the equations $x+y+z=1$, $x+2y+4z=\lambda$, $x+4y+10z=\lambda^2$ have a solution and solve them completely in each case. 12M CO1 L3

### UNIT-II

4. State and verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ and hence find $A^4$. 12M CO2 L2

**OR**

5. If $A = \begin{bmatrix} 3 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ then find the matrix P (model matrix) which transforms the matrix A to a Diagonal matrix. 12M CO2 L3

**UNIT-III**

6. a) Using Maclaurin's series, expand $\log(1+x)$ in powers of x. 6M CO3 L3

b) Find the minimum value of $x^2+y^2+z^2$ given $x+y+z=3a$ 6M CO3 L3

**OR**

7. a) If $x+y+z=u, y+z=uv, z=uvw$, then evaluate $\frac{\partial(x,y,z)}{\partial(u,v,w)}$ 6M CO3 L5

b) If $x+y+z=u, y$ Find the maximum value of $x^m y^n z^p u^r$ under the condition that $x+y+z=a$ 6M CO3 L3

**UNIT-IV**

8. Evaluate the integral by changing the order of integration $\int_0^{4a}\int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy\,dx$ 12M CO4 L5

**OR**

9. Evaluate $\int_0^{c}\int_0^{}\int_0^{x+y} e^{x+y+z}\,dz\,dy\,dx$ 12M CO4 L5

**UNIT-V**

10. a) Show that $\Gamma\left(\frac{1}{2}\right)=\sqrt{\pi}$ 6M CO5 L2

b) Evaluate $\int_0^{1} x^{\frac{3}{2}}(1-x^2)^{\frac{5}{2}}dx$ 6M CO5 L5

**OR**

11. a) State and prove relation between Beta and Gamma functions 6M CO5 L2

b) Evaluate $\int_0^{\infty} \frac{x^2}{\sqrt{1-x^5}}dx$ in terms of Beta function 6M CO5 L5

*** End ***