

Hall Ticket Number :

R-20

Code: 20AC14T

I B.Tech. I Semester Regular Examinations July 2021

Engineering Chemistry

(Common to CE & ME)

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 mark**.

3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | CO | Blooms Level |
|---|-----|--------------|
| 1. Answer ALL the following short answer questions (5 X 2 = 10M) | | |
| a) Define Scale and Sludge formation in boilers | CO1 | L1 |
| b) What are reference electrodes? | CO2 | L1 |
| c) Why GCV value is higher than NCV value? | CO3 | L1 |
| d) Define the term composites | CO4 | L1 |
| e) What are nanomaterials? | CO5 | L1 |

PART-B

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

Marks CO Blooms Level

UNIT-I

- | | | | |
|---|----|-----|----|
| 2. a) What is hard water? list any two disadvantages | 4M | CO1 | L1 |
| b) Explain the experimental determination of hardness of water by EDTA method | 8M | CO1 | L3 |

OR

- | | | | |
|---|----|-----|----|
| 3. a) List specifications for drinking water as per WHO standards. | 6M | CO1 | L4 |
| b) Describe the desalination of brackish water by reverse osmosis | 6M | CO1 | L4 |

UNIT-II

- | | | | |
|--|----|-----|----|
| 4. a) Derive Nernst equation for determination of single electrode potential | 6M | CO2 | L4 |
| b) Explain the construction and working of calomel electrode. | 6M | CO2 | L3 |

OR

- | | | | |
|---|----|-----|----|
| 5. a) Explain the electrochemical theory of corrosion by taking iron as example | 6M | CO2 | L3 |
| b) Describe various factors affecting the rate of corrosion | 6M | CO2 | L3 |

UNIT-III

- | | | | |
|---|----|-----|----|
| 6. a) Explain the mechanism of chain growth polymerization by taking an example | 6M | CO3 | L3 |
| b) Distinguish between thermoplastics and thermosetting plastics | 6M | CO3 | L2 |

OR

- | | | | |
|---|----|-----|----|
| 7. a) Describe the determination of calorific value of a fuel by using bomb calorimeter | 6M | CO3 | L3 |
| b) Write a note on octane and cetane numbers | 6M | CO3 | L2 |

UNIT-IV

- | | | | |
|---|----|-----|----|
| 8. a) What are composite materials? Describe the classification of composites | 6M | CO4 | L2 |
| b) Illustrate the properties of refractories | 6M | CO4 | L2 |

OR

- | | | | |
|--|----|-----|----|
| 9. a) Write a note on the classification of lubricants | 6M | CO4 | L1 |
| b) Describe the manufacture of Portland cement | 6M | CO4 | L2 |

UNIT-V

- | | | | |
|---|----|-----|----|
| 10. a) Describe the synthesis of nanomaterials by Sol-gel method | 6M | CO5 | L2 |
| b) Discuss the characterization of nanomaterials by XRD technique | 6M | CO5 | L4 |

OR

- | | | | |
|---|----|-----|----|
| 11. a) Write a note on self-healing materials | 6M | CO5 | L1 |
| b) Describe the uses of Smart materials | 6M | CO5 | L2 |

*** End ***

Hall Ticket Number :

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

R-20

Code: 20A511T

I B.Tech. I Semester Regular Examinations June 2021

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 mark**.

3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | CO | Blooms Level |
|---|-----|--------------|
| 1. Answer ALL the following short answer questions (5 X 2 = 10M) | | |
| a) Define high level language and low level language | CO1 | L2 |
| b) Define an array. How to store elements in an array? | CO2 | L2 |
| c) Write a program to check whether the string is palindrome or not | CO3 | L1 |
| d) Compare and contrast calloc() and malloc(). | CO4 | L5 |
| e) Give various modes of opening a file | CO5 | L4 |

PART-B

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

Marks CO Blooms Level

UNIT-I

- | | | | |
|---|----|-----|----|
| 2. a) Briefly explain about the basic data types that C language supports. | 6M | CO1 | L5 |
| b) What is flow chart? How it is useful in writing the programs? Explain about different symbols in flow chart. | 6M | CO1 | L1 |

OR

- | | | | |
|---|----|-----|----|
| 3. a) Is there any difference between the pre-decrement and post decrement operators? Explain with suitable examples. | 6M | CO1 | L2 |
| b) Write a pseudo code for swapping two numbers without using any temporary variable. | 6M | CO1 | L1 |

UNIT-II

- | | | | |
|--|----|-----|----|
| 4. a) Compare the use of if-else construct with that of conditional operator. Explain with examples. | 6M | CO2 | L5 |
| b) Give the control flow diagram of the for loop. How is the execution of 'for' loop proceeds? | 6M | CO2 | L4 |

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 using Search techniques. | 6M | CO2 | L1 |

UNIT-III

6. a) Write a C program with recursive function that counts the number of vowels in a string. 6M CO3 L1
b) Describe the concept of functions and the mechanism of a function call. Discuss the advantages of functions 6M CO3 L2

OR

7. a) Explain about C Preprocessor with an example. 6M CO3 L1
b) Illustrate the storage classes extern, static and auto with an example 6M CO3 L4

UNIT-IV

8. a) Define a pointer. How to initialize and declare pointer variables? Explain the same with examples 6M CO4 L2
b) Write a recursive program for finding the nth Fibonacci value, using functions. 6M CO4 L1

OR

9. a) Differentiate user defined and predefined function. Explain with one example. 6M CO4 L2
b) Explain how to pass one dimensional arrays to functions. 6M CO4 L4

UNIT-V

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

OR

11. a) Write a program to count no of words and lines in a file 6M CO5 L1
b) Describe the process of handling errors during file operations. 6M CO5 L2

*** End ***

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

R-20

Code: 20AC11T

I B.Tech. I Semester Regular Examinations July 2021

Algebra and Calculus

(Common to All)

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 mark**.
 3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | CO | Blooms Level |
|--|----|--------------|
| 1. Answer ALL the following short answer questions (5 X 2 = 10M) | CO | |
| a) Find the eigen values of $A = \begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ | 1 | 1,2 |
| b) Find the symmetric matrix corresponding to the quadratic form $x^2 + 6xy + 5y^2$ | 2 | 1,2 |
| c) If $x = r \cos \Theta$, $y = r \sin \Theta$ then find $\frac{\partial(x, y)}{\partial(r, \Theta)}$ | 3 | 1.2 |
| d) Find $\int_0^1 \int_0^x xy \, dy \, dx$ | 4 | 1,2 |
| e) Define Gamma function | 5 | 1 |

PART-B

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

- | | Marks | CO | Blooms Level |
|--|-------|----|--------------|
| UNIT-I | | | |
| 2. a) Reduce the matrix $\begin{bmatrix} 0 & 1 & 2 & -2 \\ 4 & 0 & 2 & 6 \\ 2 & 1 & 3 & 1 \end{bmatrix}$ to normal form and hence find the rank. | 6M | 1 | 1,2 |
| b) Show that the equations $x + y + z = 6$, $x + 2y + 3z = 14$, $x + 4y + 7z = 30$ are consistent and solve them. | 6M | 1 | 1,2 |

OR

- | | | | |
|--|-----|---|-----|
| 3. Find the eigen values and the corresponding eigen vectors of | | | |
| $A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$ | 12M | 1 | 1,2 |

UNIT-II

- | | | | |
|---|-----|---|-----|
| 4. Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 & -1 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ and | | | |
| hence find A^{-1} and A^4 | 12M | 2 | 1,2 |

OR

5. Reduce the quadratic form $3x^2+2y^2+3z^2-2xy-2yz$ to the normal form by orthogonal transformation 12M 2 1,2

UNIT-III

6. a) If $x = r \sin \theta \cos \phi, y = r \sin \theta \sin \phi, z = r \cos \theta$, then show that $\frac{\partial(x, y, z)}{\partial(r, \theta, \phi)} = r^2 \sin \theta$ 6M 3 1,2
- b) Find the maximum and minimum values of $xy + \frac{a^3}{x} + \frac{a^3}{y}$ 6M 3 1,2

OR

7. Find the volume of the greatest rectangular parallelepiped that can be inscribed in the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$ 12M 3 1,2

UNIT-IV

8. a) Evaluate $\int_a^{2a} \int_0^{\sqrt{2ax-x^2}} xy \, dy \, dx$ 6M 4 1,2
- b) Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz \, dz \, dy \, dx$ 6M 4 1,2

OR

9. Change the order of integration and evaluate $\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dy \, dx$ 12M 4 1,2

UNIT-V

10. a) Show that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$ 6M 5 1,2
- b) Show that $\int_0^1 x^m (\log x)^n \, dx = \frac{(-1)^n n!}{(m+1)^{n+1}}$ where 'n' is a positive integer and $m > -1$ 6M 5 1,2

OR

11. a) Evaluate $\int_0^1 x^{\frac{3}{2}} (1-x^2)^{\frac{5}{2}} \, dx$ 6M 5 1,2
- b) Evaluate $\int_0^{\frac{\pi}{2}} \sin^{10} \theta \, d\theta$ 6M 5 1,2

*** End ***

Code: 20AC15T

I B.Tech. I Semester Regular Examinations July 2021

Communicative English

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

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 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 | Blooms Level |
|--|-----|--------------|
| a) Why does William Hazlett ask his son to be courteous and polite to his classmates? | CO1 | L2 |
| b) What are the types of water bodies and plant life that are talked about in the poem, "The Brook"? | CO1 | L2 |
| c) How has the prince been trapped in "The Death Trap."? | CO1 | L2 |
| d) What was the innovative approach of Mohammad Yunus to traditional approach?? | CO1 | L2 |
| e) What do you learn from the life story of Mrinalini Sarabhai? | CO1 | L2 |

PART-B

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

Marks CO Blooms Level

UNIT-I

- | | | | |
|--|-----|-----|----|
| 2. What is the author's attitude towards how one should behave with other people? Do you agree with his reasoning? Give reasons for your answer. | 12M | CO1 | L2 |
| OR | | | |
| 3. a) Change the following statements into questions. | 6M | CO3 | L4 |
| i. My grandparents live with my uncle. | | | |
| ii. He had a strange experience yesterday. | | | |
| iii. Her mother has bought a nice gift for her. | | | |
| iv. Jack has bought an interesting book from the library. | | | |
| v. They have accepted the invitation. | | | |
| vi. My neighbour is a kind-hearted lady. | | | |
| b) Identify the parts of speech of the underlined words in the following sentences. | 6M | CO3 | L4 |
| i. The car moved <u>slowly</u> around the track | | | |
| ii. He walked <u>quickly</u> through the park | | | |
| iii. He waited <u>anxiously</u> for the game to begin. | | | |

UNIT-II

- | | | | |
|---|-----|-----|----|
| 4. How has the poet described landscape, flowers, plants and colours in the poem? How does it make you feel as a reader? Substantiate your answer with examples from the poem? | 12M | CO1 | L2 |
| OR | | | |
| 5. Develop the following hints into a meaningful paragraph: | | | |
| a) Devan - clever thief - robs the rich - gives all to the sick and the needy - other thieves jealous - plan to get rid of him - challenge Devan to steal the King's pyjamas - Devan accepts challenge - finds king sleeping - opens a bottle of red ants on the bed - King badly bitten - cries for help - servants rush in pretends to look for ants - Devan removes King's pyjamas – escapes - other thieves dumbfounded - accept Devan their leader | 6M | CO4 | L3 |

- b) Manager of a firm advertised - night watchman - applicants presented - manager not satisfied - found something wrong with each man - there was Raju - an applicant - sat in a corner - patiently waiting - his turn came - manager found nothing wrong in his appearance - questioned about his health - got the reply - I suffering from sleeplessness - manager happy - appointed him

6M CO4 L3

UNIT-III

6. What can you make out of the prince's character? What kind of person do you think he is and why do you think he is that way? Use examples from the text to support your answer.

12M CO1 L3

OR

7. a) **Rearrange each group of jumbled sentences below so as to have well-written paragraphs.**

7M CO4 L4

- i. It is awarded from funds bequeathed by Alfred Nobel, a Swedish inventor and philanthropist.
- ii. Nobel's will designated six areas for which prizes could be awarded.
- iii. The funds are administered by the Nobel Foundation in Stockholm.
- iv. The Nobel Prize is considered one of the most prestigious awards made to people whose work benefits humanity.
- v. They are chemistry, physics, physiology or medicine, literature and peace.
- vi. Prizes in these seven areas are presented in December every year, in the presence of the King of Sweden, as fitting tribute to Alfred Nobel.
- vii. In 1969, economics was added to the list.

- b) **Fill in blanks in the sentences below using appropriate form of the verb in brackets.**

5M CO4 L4

- i. Tanya _____ (speak) German very well.
- ii. He _____ (prepare) the students for APPSC since January 2014.
- iii. He _____ (meet) a lot of people recently.
- iv. Did you _____ (see) me yesterday in the institution?
- v. The children _____ (not/do) their homework, so they were in trouble.

UNIT-IV

8. Describe and discuss Mohammad Yunus's contribution for the upliftment of the economic status of the poor people.

12M CO2 L4

OR

9. Prepare a narrative essay on the topic, "The proudest moment of your life."

12M CO4 L4

UNIT-V

10. **Correct the following sentences and rewrite them.**

12M CO3 L3

- i. Vijay's cap was *red in colour*.
- ii. Manisha practiced English *on a daily basis*.
- iii. The enemy was *surrounded on all sides*.
- iv. Are you going for the party?
- v. He climbed across the wall and ran until the main road.
- vi. The purse is below the pillow.
- vii. All applicants must possess an university degree.
- viii. In the class, the children were having arithmetic lesson.
- ix. After the wedding, there was a eight course meal.
- x. The petrol is expensive.
- xi. We must try harder to stop these people from destroying the nature.
- xii. He had spelt the word with a 's' instead of a 'c'.

OR

11. Narrate the inspiring story of Mrinalini Sarabhai and describe the left by her for future generation.

12M CO4 L4

*** End ***

Code: 20A312T-A

I B.Tech. I Semester Regular Examinations July 2021

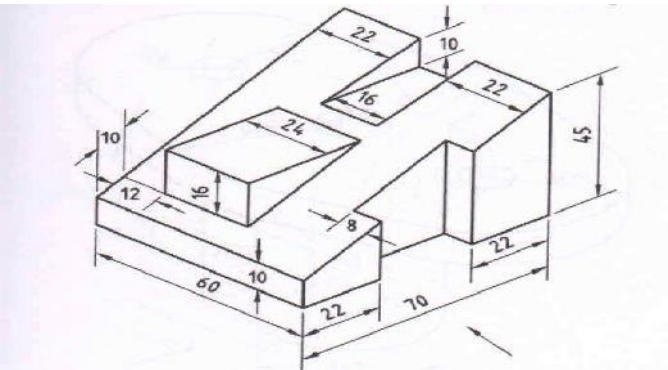
Engineering Drawing

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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

	Marks	CO	Blooms Level
UNIT-I			
1. Construct a hyperbola when the distance between the focus and directrix is 40 mm. The eccentricity is $\frac{4}{3}$. Draw a tangent and normal at any point on the curve.	14M	CO1	L1,L2
OR			
2. Draw hypo cycloid of a circle of 40 mm diameter which rolls inside another circle of 200 mm diameter for one revolution. Draw a tangent and normal at any point on it.	14M	CO1	L1,L2
UNIT-II			
3. A point A is 15 mm above H.P and 20 mm in front of V.P. Another point B is 25 mm behind V.P and 40 mm below H.P. Draw the projections of A and B, keeping the distance between the projectors equal to 90 mm. Draw straight lines, joining (i) the top views and (ii) the front views.	14M	CO2	L1,L2
OR			
4. A line CD measuring 80 mm is inclined at an angle of 30° to H.P and 45° to V.P. The point C is 20 mm above H.P and 30 mm in front of V.P. Draw the projections of the line.	14M	CO2	L1,L2
UNIT-III			
5. A square ABCD of 50 mm side, has its corner A in H.P, its diagonal AC inclined at 30° to H.P and diagonal BD inclined AT 45° to V.P and parallel to H.P. Draw its projections.	14M	CO3	L2, L1,L4
OR			
6. A regular pentagonal lamina of 30 mm sides has one edge in H.P and inclined at an angle of 30° to V.P. Draw its projections when its surface is inclined at 45° to H.P.	14M	CO3	L2, L1,L4
UNIT-IV			
7. A pentagonal prism of side of base 25 mm and axis 40 mm long is resting on H.P on a corner of its base. Draw the projections of the prism, when the base is inclined at 60° to H.P and the axis appears to be inclined at 30° to V.P.	14M	CO4	L2,L3
OR			
8. A square pyramid of base 35 mm side and axis 50 mm long is resting on one of its triangular faces on H.P, with the edge of the base containing that face inclined at 45° to V.P. Draw the projections of the pyramid.	14M	CO4	L2,L3
UNIT-V			
9. a) Draw isometric view of a horizontal cylinder of base diameter 50 mm and axis length 60 mm. b) Draw the isometric view of a cone of base diameter 50 mm and axis length 60 mm placed in the horizontal position	14M	CO5	L2,L3
OR			
10. Isometric view of an object is shown in the figure below. Draw the front view, top view and side view. All dimensions are given in millimeters.			
			
	14M	CO5	L2,L3

*** End ***