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<b>R-19</b>
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**Code: 19AC13T**

I B.Tech. I Semester Supplementary Examinations February 2022

**Chemistry of Materials**

( 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 )

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) Define Hardness of water with example. Differentiate hard and soft water	7M	CO1	L1
b) Explain the principle involved in the estimation of hardness by EDTA method	7M	CO1	L2
<b>OR</b>			
2. Define Hardness of water with example. Differentiate hard and soft water	7M	CO1	L1
<b>UNIT-II</b>			
3. a) What is electrochemical series and explain its applications	7M	CO2	L3
b) Differentiate primary cell and secondary cell	7M	CO2	L2
<b>OR</b>			
4. Describe the construction and principle involved in dry cell (leclanche cell). Summarize the important applications of dry cell	14M	CO2	L3
<b>UNIT-III</b>			
5. a) What are metallic coating explain with example	7M	CO3	L1
b) Discuss any one method of cathodic protection	7M	CO3	L2
<b>OR</b>			
6. a) How is corrosion prevented by sacrificial anode protection	7M	CO3	L1
b) Differentiate dry and wet corrosion	7M	CO3	L2
<b>UNIT-IV</b>			
7. a) Define Portland cement and explain its constituents	7M	CO4	L2
b) Discuss the chemistry behind the setting and hardening of cement	7M	CO4	L2
<b>OR</b>			
8. a) A sample of coal was found to have the following percentage composition C=72%, H=8%, O=13%, N=4% and ash 3% Calculate the higher calorific value (HCV) and lower calorific value (LCV) of coal sample	7M	CO4	L5
b) Define Higher Calorific value (HCV) and Lower Calorific Values (LCV)	7M	CO4	L1
<b>UNIT-V</b>			
9. Discuss the applications of nanomaterials in the waste water treatment, Lubricants and engine	14M	CO5	L3
<b>OR</b>			
10. a) Explain the working principle of SEM	7M	CO5	L2
b) Define smart materials and explain its property of self-healing	7M	CO5	L1

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<b>R-19</b>
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**Code: 19A311T**

I B.Tech. I Semester Supplementary Examinations February 2022

**Engineering Graphics-I**  
( Common to All CE & ME )

Max. Marks: 70

Time: 3 Hours

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

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) Divide a straight line AB of length 50 mm, into 9 equal parts.	07M	CO1	L6
b) Construct a regular Pentagon and Hexagon given the length of its side is 50mm.	07M	CO1	L6
<b>OR</b>			
2. The major and minor axes of an ellipse are 120mm and 80mm. Draw an ellipse by Arcs of circles method.	14M	CO1	L3
<b>UNIT-II</b>			
3. Draw epicycloid of a circle of 40mm diameter, which rolls outside on another circle of 120mm diameter for one revolution clockwise. Draw a tangent and a normal to it at a point 95mm from the center of the directing circle.	14M	CO2	L3
<b>OR</b>			
4. Draw the curve traced out by an end of a thin wire unwound from a regular hexagon of side 15mm the wire being kept tight. Draw a tangent & a normal to the curve at a point 80mm from the center of the hexagon.	14M	CO2	L3
<b>UNIT-III</b>			
5. A line AB has its end A 20mm above H.P. & 20mm in front of V.P. It is inclined at 40° to V.P and parallel to H.P. Draw its projections by taking the distance between the end projectors to be 50mm. Also find the true length of the line.	14M	CO3	L3
<b>OR</b>			
6. One end A of a line AB, 75mm long is 20mm above the H.P. and 25mm in front of the V.P. The line is inclined at 30° to the H.P. and the top view makes 45° with the V.P. Draw the projections of the line and find the true inclinations with the vertical plane.	14M	CO3	L3
<b>UNIT-IV</b>			
7. Draw the projections of a circle of 50mm diameter, having its plane vertical and inclined at 30° to the VP. Its center is 30mm above the HP and 20mm in front of the VP.	14M	CO4	L3
<b>OR</b>			
8. A semi-circular lamina of 64mm diameter has its straight edge in VP and inclined at an angle of 45° to HP. The surface of the lamina makes an angle of 30° with VP. Draw the projections.	14M	CO4	L3
<b>UNIT-V</b>			
9. A hexagonal pyramid side of base 25mm and axis 50mm long, rests with one of the corners of its base on HP, its axis is inclined at 30° to HP and 45° to VP. Draw its projections.	14M	CO5	L3
<b>OR</b>			
10. A pentagonal prism is resting on one of the corners of its base on the HP. The longer edge containing that corner is inclined at 45° to the base. The axis of the prism makes an angle of 30° to the V.P. Draw the projections of the solid.	14M	CO5	L3

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<b>R-19</b>
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**Code: 19AC15T**

I B.Tech. I Semester Supplementary Examinations February 2022

**Functional English and Life Skills**

( Common to CE, ME & CSE )

Max. Marks: 70

Time: 3 Hours

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

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Marks	CO	Blooms Level
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<b>UNIT-I</b>
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- |  |                                   |
|--|-----------------------------------|
| <p>1. a) Why does Hazlitt prefer to advise his son never to “despise anyone at all” in “On the Conduct of life,”?</p> <p>b) What is the meaning of the lines "If you can bear to hear the truth you've spoken ... And stoop and build 'em up with worn-out tools" in poem "If—"?</p> | <p>7M CO2 L3</p> <p>7M CO2 L2</p> |
|--|-----------------------------------|

**OR**

- |  |                   |
|--|-------------------|
| <p>2. a) <b>Fill in the blanks with appropriate form of the verbs</b></p> <p>i. These books _____ (belong/ belongs) to me.</p> <p>ii. She _____ (want/ wants) to go out there and play with friends.</p> <p>iii. We _____ (visited/ have visited) him yesterday.</p> <p>iv. He _____ (recovered/ has recovered) completely.</p> <p>v. We _____ (will like/ would like) to visit the museum.</p> <p>vi. My brother _____ (enjoy/ enjoys) playing cricket.</p> <p>vii. Now he _____ (asks/ asking) questions to see if students have understood the lesson</p>   | <p>14M CO3 L2</p> |
| <p>b) <b>Change the following sentences as directed.</b></p> <p>i. I saw him yesterday ( change it into Negative statement)</p> <p>ii. She is singing a song. (change it into Interrogative)</p> <p>iii. He comes to college by bus. ( change it into Negative statement)</p> <p>iv. They have not done an excellent job in repairing the machine. ( change it into Assertive )</p> <p>v. She felt very happy about her results. (change it into Negative statement)</p> <p>vi. Does man live by water alone? ( change it into Assertive)</p> <p>vii. The quality of the apples are not good.( change it into Interrogative)</p> | <p>7M CO3 L2</p>  |

<b>UNIT-II</b>
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3. How did George Bernard Shaw confront his fear of public speaking and became a great speaker? 14M CO2 L3

**OR**

4. a) **Fill in the blanks with A/An/The/No article**

- i. Could you get me \_\_\_\_\_ kilogram of tea, please.
- ii. They are staying at \_\_\_\_\_ hotel.
- iii. Have you had \_\_\_\_\_ breakfast?
- iv. I read \_\_\_\_\_ amazing story yesterday.
- v. I saw \_\_\_\_\_ eagle fly by.
- vi. The table is made of \_\_\_\_\_ wood.

**vii.** I saw \_\_\_\_\_ movie yesterday. 14M CO3 L2

- b) Fill in the blanks with the most suitable transitions from the list. Use each transition only once unless instructed otherwise.

( Thus, This, Then, First, Second, For example, A further, They, The final, Indeed, Finally, Rather)

A child may leave home for a number of reasons, but three seem to be more common than any others. 1- \_\_\_\_\_, a child may leave home because of lack of parental affection, which can leave the child with emotional scars. When parents are cold and uncaring, a child senses 2- \_\_\_\_\_ and feels that s/he does not belong in the home. The child will 3- \_\_\_\_\_ leave, seeking a home where s/he at least feel s wanted and a part of a family. 4- \_\_\_\_\_, when a child feels that s/he is not given just recognition as a person and as an individual, s/he may feel frustrated enough to leave home- especially if he parents do not stop what they are doing long enough to really listen to him/her or at least to respect some of the child's opinions. 5- \_\_\_\_\_, severe punishment by a child's parents, which does not suit the child's misconduct, may cause him/her to leave home. 6- \_\_\_\_\_, severe punishment is child abuse, and a child will normally feel that s/he is not safe in such a home. 7- \_\_\_\_\_ for his/her own protection and for affection s/he may leave home.

7M CO3 L2

<b>UNIT-III</b>
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5. Describe the conversation between Stronetz and the Prince in the play" The Death Trap". What do you understand from it? 14M CO1 L2

**OR**

6. a) **Fill in the blanks in the sentences below using the appropriate form of the verb in the brackets.**

- i. She told me that something \_\_\_\_\_ to him. (happen)
- ii. James is a student. But he \_\_\_\_\_ this week (work)
- iii. When I arrived at the party, everybody \_\_\_\_\_ home. (go)
- iv. All the guests \_\_\_\_\_. let us go to bed now. (leave)
- v. Computers \_\_\_\_\_ large amounts of data. (store)
- vi. Jhon \_\_\_\_\_ a lot of friends. (have)
- vii. He \_\_\_\_\_ all his childhood in a quaint village in China. (spend)

7M CO3 L2

b) **Choose the correct form of the verb that agrees with the subject.**

- i. Sally \_\_\_\_\_ (run) to the park every day.
- ii. One of the team \_\_\_\_\_ (be) missing.
- iii. Both the rice and the curd \_\_\_\_\_ (be) fresh and tasty.
- iv. Eighty dollars \_\_\_\_\_ (be) what it would cost to buy the new pixel phone?
- v. He \_\_\_\_\_ (live) in that big house.
- vi. \_\_\_\_\_ (do) she know what she is doing?
- vii. I \_\_\_\_\_ (visit) my grandparents every Sunday.

7M CO3 L2

#### UNIT-IV

7. **Choose the correct form of the verb that agrees with the subject.**

- a) Each of these producers \_\_\_\_\_ his own advantage, ( have)
- b) Ten miles \_\_\_\_\_ long distance, (be)
- c) Many a student \_\_\_\_\_ hard to pass his entrance exam, (try)
- d) The furniture in his house \_\_\_\_\_ impressive, (look)
- e) Few students \_\_\_\_\_ present in the class today, (be)
- f) Ritesh, my best friend \_\_\_\_\_ leaving for Japan next week, (be)
- g) Most of my friends \_\_\_\_\_ government employees, (be)
- h) The level of intoxication \_\_\_\_\_ from subject to subject, (vary)
- i) Either boys or girls \_\_\_\_\_ telling lies, (be)
- j) A number of people \_\_\_\_\_ reported to be missing in the train accident at Jhansi. (be)
- k) The coat or the hats \_\_\_\_\_ (be) in that closet.
- l) Many Japanese \_\_\_\_\_ fascinated by American popular culture.
- m) The young \_\_\_\_\_ their whole lives ahead of them. ( have)
- n) The local news (begins, begin) at eleven.

14M CO3 L2

**OR**

8. How does the doctor stop the conspirators from killing the prince in "The Death Trap"? What is the irony behind this trick? 14M CO1 L2

**UNIT-V**

9. Explain the character of Chindu Yellamma and her efforts to make "Chindu Bhagavatam" as a popular Folk-art form? 14M CO1 L2

**OR**

10. Write an essay on "Problems and Issues faced by women in India" in not less than 400 words. 14M CO4 L4

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<b>R-19</b>
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**Code: 19A511T**

I B.Tech. I Semester Supplementary Examinations February 2022

**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 )

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) What is an algorithm? Describe the characteristics of an Algorithm	6M		
b) What is flowchart? Describe various symbols used in flowcharts.	8M		
<b>OR</b>			
2. a) What is data type? Explain basic data types and their sizes used in a C Language	7M		
b) What are the relational operators? Explain with example.	7M		
<b>UNIT-II</b>			
3. a) Describe Conditional Statements used in C Language	7M		
b) Compare While and do.. While statements with suitable example code.	7M		
<b>OR</b>			
4. a) Define an array. Explain how to declare and initialize arrays.	7M		
b) Write a c program to sort the list of numbers using bubble sort. Explain with an example.	7M		
<b>UNIT-III</b>			
5. a) What is a string with respect to C? How is it declared, initialized and manipulated?	7M		
b) Describe parameter passing techniques for functions.	7M		
<b>OR</b>			
6. a) Illustrate the storage classes extern, static and auto with an example to each.	7M		
b) Write a C program to perform multiplication of two matrices	7M		
<b>UNIT-IV</b>			
7. a) What is a pointer? What are the features of pointers? Write a C program to print address of a variable	7M		
b) Write a c program to swap two numbers using call by reference.	7M		
<b>OR</b>			
8. Differentiate static and dynamic memory allocation. How to allocate and freeing dynamic memory allocation. Explain with an example.	14M		
<b>UNIT-V</b>			
9. a) Define Structures. Explain with an example how structure members are initialized and accessed	7M		
b) Explain different modes to open a file	7M		
<b>OR</b>			
10. a) Write a program to copy content of existing file to another file.	7M		
b) Differentiate between a structure and union with respective allocation of memory by the compiler. Given an example of each.	7M		

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Code: 19AC11T

I B.Tech. I Semester Supplementary Examinations February 2022

**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 )

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**UNIT-I**

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

Marks CO Blooms Level

7M CO1 L3

7M CO1 L3

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

**OR**

2. Show that the system of equations

 $2x_1 - 2x_2 + x_3 = \lambda x_1, 2x_1 - 3x_2 + 2x_3 = \lambda x_2, -x_1 + 2x_2 = \lambda x_3$  can possess a non-trivial solution only if  $\lambda = 1, \lambda = -3$ . Obtain the general solution in each case.

14M CO1 L2

**UNIT-II**

3. Verify Cayley-Hamilton theorem for the matrix  $A = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & 1 \\ 2 & 1 & 2 \end{bmatrix}$  and hence find

 $A^{-1}$  using Cayley-Hamilton theorem.

14M CO2 L2

**OR**4. Reduce the quadratic form  $3x^2 + 2y^2 + 3z^2 - 2xy - 2yz$  to canonical form by using orthogonal transformation.

14M CO2 L3

**UNIT-III**

5. If  $u = x + 3y^2 - z^3, v = 4x^2yz, w = 2z^2 - xy$ , then evaluate  $\frac{\partial(u,v,w)}{\partial(x,y,z)}$  at (1,-1,0)

14M CO3 L3

**OR**6. Find the minimum value of  $x^2 + y^2 + z^2$  given  $x + y + z = 3a$ 

14M CO3 L3

**UNIT-IV**7. a) Using Taylor's theorem, express the polynomial  $2x^3 + 7x^2 + x - 6$  in powers of  $(x-1)$ .

7M CO4 L3

b) Using Maclaurin's series, expand  $e^x$  in powers of  $x$ .

7M CO4 L3

**OR**8. Trace the curve  $y^2(2a-x) = x^3$ 

14M CO4 L4

**UNIT-V**

9. Evaluate  $\int_0^1 \int_0^1 \int_0^1 xyz \, dx \, dy \, dz$

7M CO5 L3

**OR**10. Define Gamma Function, Beta Function and Evaluate  $\int_0^1 x^4 \left( \log \frac{1}{x} \right)^3 dx$  using  $\Gamma$  function.

14M CO5 L1

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