Hall Ticket Number :										

R-19

Code: 19AC13T

I B.Tech. I Semester Regular Examinations January 2020

Chemistry of Materials

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) What is osmosis? How is reverse osmosis used for desalination of water 6M
   b) What are ion exchange resins? Discuss their applications in water softening. 8M

OR

2. a) Differentiate between scale and sludge. How are scales formed? What are their disadvantages? 8M
   b) Why EDTA is used in estimation of hardness? What is the principle behind EDTA titration? 6M

UNIT–II

3. a) Derive Nernst's equation for single electrode potential and explain the terms involved in it. Write its applications. 8M
   b) What is standard electrode potential? Give its importance. 6M

OR

4. a) Define fuel cell. Explain the construction and working of hydrogen-oxygen fuel cell. 8M
   b) Discuss the working principle of primary batteries. 6M

UNIT–III

5. a) Discuss the various factors affecting rate of corrosion. 6M
   b) What is cathodic protection? Explain sacrificial anodic method & impressed current method. 8M

OR

6. a) Describe the mechanism of wet or electrochemical corrosion. 8M
   b) Describe the steps involved in dry or chemical corrosion. 6M

UNIT–IV

7. a) List the differences between thermoplastic and thermosetting resins. 6M
   b) Give the preparation, properties and uses of PVC. 8M

OR

8. a) What is portland cement? How is it manufactured? 8M
   b) What is knocking and anti-knocking agents? 6M

UNIT–V

9. a) How are nanomaterials classified? Give with examples. 6M
   b) What are nano materials? Explain about the applications of nanomaterials. 8M

OR

10. a) Discuss the preparation of nano materials by sol-gel method 8M
    b) What are the advantages of smart materials? 6M

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Hall Ticket Number :										

R-19

Code: 19A311T

I B.Tech. I Semester Regular Examinations January 2020

Engineering Graphics -I

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. Construct an ellipse when the distance between the focus and the directrix is 30mm and the eccentricity is 3/4. Draw a tangent and normal at any point P on the curve. 14M

OR

2. a) Draw a tangent to a circle from a point P outside it. 7M

   b) Construct a regular Octagon of side 30mm. 7M

UNIT–II

3. A coir is unwound from a drum of 30 mm diameter. Draw the locus of the free end of the coir for unwinding through an angle of 360^0. Draw also a normal and tangent at any point on the curve 14M

OR

4. Draw epicycloid, given the radii of generating and directing circles as 20 mm and 72 mm respectively. Also draw a normal and tangent at any point on the curve. 14M

UNIT–III

5. a) A point P is 20 mm in front of V.P and 35 mm above the H.P. Another point Q is 35 mm in front of the V.P and 20 mm above the H.P. The distance measured between the projectors is 45 mm. Draw the projections and find the distance between them. 7M

   b) Draw the projections of a straight line CD 50 mm long, parallel to H.P and inclined to V.P. The end C is 10 mm in front of V.P and D is 30 mm in front of V.P. The line is 15mm above H.P 7M

OR

6. A line measuring 75 mm long has one of its ends 50 mm in front of V.P and 15 mm above H.P. The top view of the line is 50 mm long. Draw and measure the front view. The other end is 15 mm in front of V.P and is above H.P. 14M

UNIT–IV

7. A hexagonal lamina of 40 mm side is resting on one of its corner in the H.P. Its plane is inclined at an angle of 30^0 to H.P and perpendicular to V.P. draws the Projections. 14M

OR

8. Draw the Projections of pentagonal plane side 25 mm, resting in the H.P on one of its edge. The plane of the pentagon is inclined at 45^0 to the H.P and perpendicular to V.P. and its edge makes an angle of 30^0 with the V.P. 14M

UNIT–V

9. Draw the projections of a cone, base 30 mm diameter and axis 50 mm long resting on H.P on a point of its base circle, axis making angle of 45^0 with H.P and its top view making angle of 30^0 with the V.P. 14M

OR

10. A hexagonal pyramid side of base 25 mm and axis 50 mm long rests with one of the corner of its base on H.P. Its axis is inclined at 30^0 to H.P and 45^0 to V.P. Draw its projections. 14M

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Hall Ticket Number :										

R-19

Code: 19AC15T

I B.Tech. I Semester Regular Examinations January 2020

Functional English and Life Skills

(Common to CE, ME & CSE)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) Do you agree with William Hazlitt's view that we should never judge the people the first time you encounter them? Why? 7M

   b) **i. Change the following statements into question forms**

      a. My mother loves cooking.
      b. Prabhu arrived in the evening.
      c. This is Raghu's dog.
      d. The blue colour car hit the pole.

   ii. Identify the parts of speech (underlined words)in the following sentences

      a. I placed a <u>bunch</u> of keys on the table
      b. I have l<u>oving</u> parents
      c. She is sleeping <u>peacefully</u> 7M

OR

2. a) What are the positive values that one should cultivate to lead a successful life according to Rudyard Kipling's poem 'If'? 7M

   b). Write two short paragraphs about "ragging" and give an apt title for your writing. 7M

UNIT–II

3. How does Tennyson describe the landscape, flowers, plants and colours in the poem *The Brook*? Did you enjoy the poem? Why? 14M

OR

4. a) What does Bernard Shaw do to overcome the fear of public speaking? What do you do to improve your public speaking? 7M

   b) **i. Fill in the blanks with suitable articles**

   My mother is _____ English teacher. She works in _____ Indian School. She is _____ youngest teacher in the school.

   ii. Fill in the blanks with suitable prepositions

   The chameleon is a relative ____ the lizard. It is a reptile. It can be found ____ Africa and Madagascar. The chameleon can remain very still _____ a branch____ hours. 7M

UNIT–III

5. a) How does the doctor stop the conspirators from killing the prince in the drama *The Death Trap*? What is the irony behind this trick? 7M

   b) **i. Rewrite the sentences as per the directions given in brackets**

      a. He said to me, "Please come immediately" (into indirect speech)
      b. My teacher said to me, "Why are you coming late?" (into indirect speech)
      c. He said, "How difficult mathematics is!" (into indirect speech)

   ii. Fill in the blanks with suitable verbs

   My father is a lecturer. He ___(go) to college every day. Today my father ____(go) to the airport to receive my uncle. My uncle ___(work) in a company in Australia ever since I _____ (be) a child. 7M

OR

6. a) Explore the ideas of Seneca *On Saving Time*. 7M

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

   a. Manaswith's 'smart chair' has a timer, DC motor (vibrator), buzzer and air blower.
   b. His invention has also won him a prize at the INSEF Regional Science Fair in Rajkot last January.
   c. If you still refuse to get up, after one minute, the hot air blower is on forcing the person to get up from the seat.
   d. He designed the chair to help techies suffering from physical problems arising out of spending long hours before computer.
   e. Still if the user refuses to get up, the monitor automatically shuts down.
   f. A 14-year-old Class IX boy, Manaswith Shankar, has designed a smart chair.
   g. After two hours of continuous sitting, the buzzer gets on after one-minute interval, the chair begins to vibrate. 7M

UNIT–IV

7. a). Do you like Yellamma? Discuss briefly the aspects you like about Yellamma. 7M

   b). **i. Rewrite the following sentences as per the directions given in brackets**

   a. The dog is the most faithful animal. (into comparative and positive)
   b. She is one of the best players in the country. (into comparative and positive)

   ii. Write the adjective forms for the following words.

   a. Circle
   b. Courage
   c. Envy
   d. Defense
   e. Respond 7M

OR

8. Describe the College you studied your Intermediate course by comparing and contrasting it with other colleges in your place. 14M

UNIT–V

9. a) According to George Orwell, what are the negative impacts on thought that influence the English Language and what are remedies he suggests to have clear thinking? 7M

   b). **Correct the following sentences**

   i. I finished my homework just now.
   ii. She got married my uncle.
   iii. Birds of same feather flocks together.
   iv. I am going to home for vacation.
   v. She has been watching the cricket match since four hours.
   vi. One of my uncles work at the Apollo Hospital.
   vii. There is a school for deaf in Tirupati. 7M

OR

10. Write an essay on the advantages and disadvantages of using internet. 14M

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Hall Ticket Number :										

R-19

Code: 19A511T

I B.Tech. I Semester Regular Examinations January 2020

Problem Solving and C programming

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) Define Algorithm. Explain the characteristics of algorithm 7M

   b) List and explain briefly about various computer languages 7M

OR

2. a) What is meant by flow chart? Explain the symbols used in flowchart with an example. 7M

   b) Write a C Program to find maximum number among three numbers using conditional operator. 7M

UNIT–II

3. Write a program in C language to perform the matrix multiplication. 14M

OR

4. a) Explain conditional statements with an example. 7M

   b) Write a c program to find whether the number is prime number or not. 7M

UNIT–III

5. a) Define string. Explain declaration of string. Explain any three string handling functions with neat syntax and example 6M

   b) What is recursion? Explain with an example 8M

OR

6. Explain all types of preprocessor directives with example 14M

UNIT–IV

7. a) What is pointer? How to initialize and declare pointer variables? Explain with examples. 7M

   b) Write a program to swap to numbers using pointers and functions. 7M

OR

8. a) What are the functions for dynamic memory management? Explain. 7M

   b) How do you use a pointer as a formal parameter of a function which is designed to manipulate an array? Explain. 7M

UNIT–V

9. a) Distinguish between structures and unions. 8M

   b) Write a C program to maintain a record of n students with four fields (Roll no, name, marks and grade). Print the student details 6M

OR

10. a) Define file. Write a C program to write character to a file and reading character from file. 8M

    b) Give brief description about the various modes of a file opening. 6M

		CO	Blooms Level
1.	a)	CO1	L1
	b)	CO1	L2
2.	a)	CO1	L1
	b)	CO1	L3
3.		CO2	L3
4.	a)	CO2	L2
	b)	CO2	L3
5.	a)	CO3	L1
	b)	CO3	L2

		CO	Blooms Level
6.		CO3	L2
7.	a)	CO4	L1
	b)	CO4	L3
8.	a)	CO4	L2
	b)	CO4	L1
9.	a)	CO5	L4
	b)	CO5	L3
10.	a)	CO5	L3
	b)	CO5	L1

Hall Ticket Number :										

R-19

Code: 19AC11T

I B.Tech. I Semester Regular Examinations January 2020

Algebra and Calculus

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) Reduce the matrix $A=\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$ to Echelon form and hence find its rank. **7M**

b) Show that the system of equations $x+2y+2z=2$, $3x-2y-z=5$, $2x-5y+3z=-4$, $x+4y+6z=0$ is consistent and hence solve it. **7M**

OR

2. Find the eigen values and eigen vectors of the following matrix

$$A=\begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}.$$

14M

UNIT–II

3. Verify Cayley-Hamilton theorem for $A=\begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$ and hence find A^{-1} and A^4 of the matrix. **14M**

OR

4. Reduce the Quadratic form $3x^2+5y^2+3z^2-2xy-2yz+2zx$ to canonical form by an orthogonal transformation and state the nature of the quadratic form. Also find matrix of the transformation. **14M**

UNIT–III

5. a) If $z=f(x+ay)+¤(x-ay)$, prove that $\frac{\partial^2 z}{\partial y^2}=a^2\frac{\partial^2 z}{\partial x^2}$. **7M**

b) Discuss the maxima and minima of $f(x,y)=x^3y^2(1-x-y)$. **7M**

OR

6. a) If $x=r\sin^{-}\cos¤$, $y=r\sin^{-}\sin¤$, $z=r\cos^{-}$ show that $\frac{\partial(x,y,z)}{\partial(r,^{-},¤)}=r^2\sin^{-}$. **7M**

b) A rectangular box open at the top is to have volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction. **7M**

UNIT–IV

7. a) Obtain the Taylor's series expansion of sin2x about $x = \frac{®}{4}$. **7M**

   b) Trace the curve $x^3 + y^3 = 3axy$. **7M**

OR

8. a) Obtain the Maclaurin's series expansion of $\log(1+\sin^2 x)$ up to the term containing x^6. **7M**

   b) Trace the curve $r^2 = a^2 \cos 2^{-}$. **7M**

UNIT–V

9. a) Evaluate $\iint_R ydxdy$ where R is the region bounded by the parabolas $y^2 = 4x$ and $x^2 = 4y$. **7M**

   b) Prove that $(m, 1/2) = 2^{2m-1}\ (m, m)$. **7M**

OR

10. a) By changing the order of integration of $\int_0^{\infty}\int_0^{\infty} e^{-xy} \sin px\, dxdy$, show that $\int_0^{\infty} \frac{\sin px}{x} dx = \frac{®}{2}$. **7M**

    b) Show that $\Gamma(1/2) = \sqrt{®}$. **7M**

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		CO	Blooms Level
1.	a)	CO1	L3
	b)	CO1	L3
2.		CO1	L3
3.		CO2	L3
4.		CO2	L3
5.	a)	CO3	L3
	b)	CO3	L6
6.	a)	CO3	L3
	b)	CO3	L3

		CO	Blooms Level
7.	a)	CO4	L2
	b)	CO4	L2
8.	a)	CO4	L2
	b)	CO4	L2
9.	a)	CO5	L3
	b)	CO5	L3
10.	a)	CO5	L3
	b)	CO5	L3