

Hall Ticket Number :

R-15

Code: 5GC12

I B.Tech. I Semester Supplementary Examinations June 2017

Engineering Chemistry

(Common to CE, ME, CSE and IT)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) Write short notes on
- i) Colloidal conditioning 7M
 - ii) Calgon conditioning 7M
- b) Explain the "Chlorinator" used in purification of drinking water. 7M

OR

2. a) Give a detailed account on Caustic embrittlement 7M
- b) Write short notes on Boiler corrosion. How it can be prevent? 7M

UNIT-II

3. Explain the following
- a) Galvanic corrosion. 7M
 - b) Concentration cell corrosion 7M

OR

4. a) Write briefly about primary cells and secondary cells. 7M
- b) Explain the construction and functioning of the Nickel-cadmium battery. 7M

UNIT-III

5. a) Write the following Thermoplastic & Thermosetting resine. 7M
- b) Distinguish between addition & condensation polymerization. 7M

OR

6. How polyaniline and polyacetylene acts as conducting polymers? Explain the mechanism of conduction of electrons through the polymers 14M

UNIT-IV

7. a) How are Octane number and Cetane number related to chemical composition and molecular structure of fuel? 7M
- b) How would you explain the chemistry of manufacture of water gas? 7M

OR

8. a) Examine the various constituents that are normally present in petroleum crude. 4M
- b) Illustrate the function of petroleum refineries in processing crude petroleum. 10M

UNIT-V

9. a) Define Lubricant? Give the functions of Lubricants. 7M
- b) Write short notes on extreme – Pressure Lubrication. 7M

OR

10. Give an account of flash and fire point of a Lubricant. Describe the determination of flash point by Penskey-Marten's method. 14M

Code: 5G513

I B.Tech. I Semester Supplementary Examinations June 2017

Engineering Drawing-I

(Common to EEE, ECE, CSE and IT)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) Draw a regular hexagon of 50mm side
- b) Construct a regular heptagon of 45mm side

OR

2. a) Inscribe a regular pentagon in a circle of 100mm diameter.
- b) Draw a circle of 80mm diameter. Construct an equilateral triangle inside this circle, the vertices being on the circle.

UNIT-II

3. The distance between the focus and directrix of an ellipse is 45mm. construct the ellipse, if the eccentricity is $\frac{3}{4}$

OR

4. Inscribe an ellipse in a rectangle of sides 85mm & 50mm. draw a normal and tangent to the curve at a point on it 20mm from the major axis.

UNIT-III

5. Construct a cycloid with a rolling circle of 50mm diameter. Draw a tangent to the curve at a point on it 40mm from the directing line.

OR

6. A circle of 40mm diameter rolls without slipping, on another circle of 120mm. diameter. Draw the epicycloid.

UNIT-IV

7. The top view of a 80mm long line measures 60mm. the line is in the V.P. and its one end is 20mm above the H.P. draw its projection and find its inclination with the H.P.

OR

8. Two pegs fixed on a wall are 5m apart. The distance between the pegs, measured parallel to the floor is 4m. if one peg is 2m above the floor, find the height of the 2nd peg above the floor, graphically

UNIT-V

9. PQ is a 125mm long line. Its top view is 110mm long and the front view is 80mm long. P is 20mm above H.P. and 20mm in front of V.P. Draw its projections and determine its inclinations with H.P. & V.P.

OR

10. A line AB, 80 mm long, has A in H.P. but 15mm in front of V.P. The line is inclined at 30° to H.P. and 60° to V.P. Draw its projections and determine the length of front view and top view.

Code: 5GC14

I B.Tech. I Semester Supplementary Examinations June 2017

Engineering Mathematics-I

(Common All Branches)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) Solve $(x + 2y^3) \frac{dy}{dx} = y$ 7M

b) Find the orthogonal trajectories of the family of confocal conics $\frac{x^2}{a^2} + \frac{y^2}{b^2 + \lambda} = 1$ where λ is the parameter 7M

OR

2. a) Solve $\frac{dy}{dx} = \frac{y}{x + \sqrt{xy}}$ 7M

b) A body originally at $80^\circ C$ cools down to $60^\circ C$ in 20 minutes, the temperature of the air being $40^\circ C$. What will be the temperature of the body after 40 minutes from the original? 7M**UNIT-II**

3. a) Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{3x}$ 7M

b) In an L.C.R circuit the charge q on a plate of a condenser is given by $L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{C} = E \sin pt$ the circuit is turned to resonance so that $p^2 = \frac{1}{LC}$ find the current i 7M**OR**

4. a) Solve $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 25y = e^{2x} + \sin x + x$ 7M

b) Solve $(D^3 + 2D^2 + D)y = x^2 e^{2x} + \sin^2 x$ 7M

UNIT-III

5. a) Solve in series the equation $\frac{d^2y}{dx^2} + x^2y = 0$ 7M

b) Verify Rolle's theorem for $f(x) = (x-a)^m(x-b)^n$ where m, n are positive integers in $[a, b]$. 7M**OR**

6. a) Solve in series the equation $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} + 4y = 0$ 7M

b) Expand $e^{a \sin^{-1} x}$ in ascending powers of x 7M

UNIT-IV

7. a) Find first and second partial derivatives of $f(x, y) = ax^2 + 2hxy + by^2$ and verify $\frac{\partial^2 f}{\partial x \partial y} = \frac{\partial^2 f}{\partial y \partial x}$ 7M
- b) Find the maximum and minimum values of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ 7M

OR

8. a) If $u = x^2 - 2y$, $v = x + y + z$, $w = x - 2y + 3z$, find $\frac{\partial(u, v, w)}{\partial(x, y, z)}$ 7M
- b) Find the dimensions of the rectangular box, open at the top, of maximum capacity whose surface is 432 sq.cm. 7M

UNIT-V

9. Trace the curve $y^2(a - x) = x^3$, $a > 0$ 14M
- OR**
10. Trace the curve $r = a \sin 3\theta$, 14M

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Code: 5GC11

I B.Tech. I Semester Supplementary Examinations June 2017

English through Literature

(Common All Branches)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. Estimate G.B. Naidu's contribution to the field of science. 14M

OR

2. a) How does the poet describe nature in "The Road not Taken"? 7M
b) Assess the character of Cabuliwala. 7M

UNIT-II

3. a) Give the summary of Rudyard Kipling's poem "If". 7M
b) In what way Sudha Murthy's life remain exemplary? 7M

OR

4. Critically analyse the story "A Dog's Tale" 14M

UNIT-III

5. Justify the title of the story " Gift of Magi" 14M

OR

6. a) Appreciate the poem "Leisure" 7M
b) Write a note on Vijay Bhatkar 7M

UNIT-IV

7. a) Compare the attitude of father with that of peasants in "Night of the Scorpion"? 7M
b) Estimate the contribution of Bose to the field of science 7M

OR

8. Examine the role of fate in "An Astrologer's Day" 14M

UNIT-V

9. Critically appreciate Chekhov's play "The Proposal" 14M

OR

10. Who is Homi Jehanghir Baba? Briefly discuss the various positions he held, institutions he established and awards he received and contributions he made to the development of India. 14M

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I B.Tech. I Semester Supplementary Examinations June 2017

Mathematical Methods

(Common to CSE and IT)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) Reduce the matrix to normal form and find its rank

$$\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & 2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$$

8M

- b) Solve completely
- $2x - y + z = 5$
- ,
- $3x + y - 2z = -2$
- ,
- $x - 3y - z = 2$
- .

6M

OR

2. a) If the following system has a non-trivial solution, Prove that
- $a + b + c = 0$
- (or)
- $a = b = c$
- .
- $ax + by + cz = 0$
- ,
- $bx + cy + az = 0$
- ,
- $cx + ay + bz = 0$

7M

- b) Solve
- $x + y + z = 9$
- ,
- $2x + 5y + 7z = 52$
- and
- $2x + y - z = 0$

7M

UNIT-II

3. a) Verify Cayley-Hamilton theorem and find the inverse for the matrix

$$A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$

6M

- b) Diagonalise the matrix
- $\begin{bmatrix} -1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$

8M

OR

4. a) Find the eigen roots and eigen vectors of the matrix
- $\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$
- .

7M

- b) Diagonalise
- $A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$
- and hence find
- A^8
- .

7M

UNIT-III

5. Reduce the Quadratic form
- $8x^2 + 7y^2 + 3z^2 - 12xy - 8yz + 4zx$
- to the normal form by orthogonal transformation..

14M

OR

6. a) Reduce the quadratic form
- $7x^2 + 6y^2 + 5z^2 - 4xy - 4yz$
- to the canonical form.

8M

- b) Discuss the nature of the quadratic form
- $x^2 + 4xy + 6xz - y^2 + 2yz + 4z^2$
- .

6M

UNIT-IV

7. a) Find the real root of the equation $x^3 - 2x - 5 = 0$ by regula-falsi method correct to three decimals. 7M
- b) Using Newton's -Raphson method, find the real root of $x^3 - 3x + 1 = 0$ correct to 3 decimals. 7M

OR

8. a) Find the real root of the equation $e^x = 4 \sin x$ by using bisection method correct to four decimals. 7M
- b) Evaluate $\sqrt[3]{24}$ by Newton's iteration method correct to four decimals. 7M

UNIT-V

9. a) Given $\sin 45^\circ = 0.7071, \sin 50^\circ = 0.7660, \sin 55^\circ = 0.8192, \sin 60^\circ = 0.8660$. find $\sin 52^\circ$, using Newton's forward formula. 7M
- b) Find the interpolating polynomial for the following, also find $f(10)$. 7M

x	5	6	9	11
$f(x)$	12	13	14	16

OR

10. a) Find $y^1(0)$ & $y^{11}(0)$ from the following data given below. 8M

x	0	1	2	3	4	5
y	4	8	15	7	6	2

- b) Evaluate $\int_0^1 \sqrt{1+x^4} dx$ using simpson's $\frac{3}{8}$ rule. 6M

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I B.Tech. I Semester Supplementary Examinations June 2017

Problem solving Techniques and Introduction to 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 = 70Marks)

UNIT-I

1. a) What is the role of Debugging programs in implementation of algorithms? 6M
- b) Define Flow Chart? Draw a flow chart to read 50 numbers and print their sum. 8M

OR

2. a) What is the need of Computer Language? Describe different computer languages in detail. 7M
- b) Does the use of Procedures will emphasize modularity of the program? Justify. 7M

UNIT-II

3. a) List and explain various Bitwise Operators with suitable examples. 6M
- b) What are the rules to be followed in naming a variable? 8M

OR

4. a) What is a data type? Write in brief about the data types in C. 6M
- b) Illustrate about various input and output statements in C. 8M

UNIT-III

5. a) Differentiate break and continue with a suitable example. 5M
- b) Write code segments for displaying numbers from 1 to 10 using While, do ..while, and for statements. 9M

OR

6. a) Illustrate multi way selection statement with sample c code. 7M
- b) Write a C program to find the given number is palindrome or not. 7M

UNIT-IV

7. a) Write a C program to find the maximum element in an array. 7M
- b) Write a C program to find the occurrence of a substring in a given string. 7M

OR

8. What is an Array? How to declare two dimension array? Write a C program to perform multiplication of two matrices. 14M

UNIT-V

9. a) Compare library functions and user-defined functions. 7M
- b) Write a C program which uses a recursive function to evaluate,
 $F(x) = x - x^3/3! + x^5/5! - x^7/7! + \dots$ 7M

OR

10. What are the storage classes in C? Explain their usage with suitable examples. 14M
