Hall Ticket Number :										

R-17

Code: 7GC14

I B.Tech. I Semester Supplementary Examinations June 2022

Engineering Mathematics-I

(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. Find the Rank of the matrix $A=\begin{bmatrix} 1 & 2 & 3 & 4 \\ -2 & -3 & 1 & 2 \\ -3 & -4 & 5 & 8 \\ 1 & 3 & 10 & 14 \end{bmatrix}$

OR

2. Verify Cayley-Hamilton theorem for the matrix for the matrix $A=\begin{bmatrix} 3 & 2 & 4 \\ 4 & 3 & 2 \\ 2 & 4 & 3 \end{bmatrix}$

UNIT–II

3. a) Show that the Eigen values of a Hermitian matrix are all real

   b) Show that $\frac{1}{2}\begin{bmatrix} 1+i & -1+i \\ 1+i & 1-i \end{bmatrix}$ is a unitary matrix

OR

4. Show that $A=\begin{bmatrix} i & 0 & 0 \\ 0 & 0 & i \\ 0 & i & 0 \end{bmatrix}$ is Skew-Hermitian and also unitary matrix.

UNIT–III

5. a) $Solve\ (1+x^2)dx = (tan^{-1}y - x)dx$

   b) $Solve\ \frac{dy}{dx} + x\sin 2y = x^3\cos^2 y$

OR

6. If the temperature of a body is changing from 100^0c to 70^0c in 15 minutes, find when the temperature will be 40^0c, if the temperature of air is 30^0c.

UNIT–IV

7. Solve $\frac{d^2y}{dx^2} + a^2y = \text{Tan}\, ax$ by the method of variation of parameters.

OR

8. Solve $\frac{d^3y}{dx^3} - y = e^x + \sin 3x + 2$

UNIT–V

9. If $x+y+z=u, y+z=uv, z=uvw, then\ evaluate \frac{\partial(x,y,z)}{\partial(u,v,w)}$

OR

10. Find the maxima and minima of $z = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$

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Hall Ticket Number :										

R-17

Code: 7G111

I B.Tech. I Semester Supplementary Examinations June 2022

Problem Solving Techniques 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

UNIT–I

1. a) Define Computer? Explain hardware and software components of a computer.
   b) Write and algorithm and draw a flow chart to calculate percentage of a student in six subjects.

OR

2. a) Explain different types of computer languages in detail.
   b) What is Keyword? Write and explain any ten keywords in C programming language.

UNIT–II

3. a) Define operator? Describe different types of operators used in c language with example.
   b) What are formatted input and output functions in used in C explain with an example.

OR

4. a) Explain different data types in C programming language.
   b) Evaluate the following expression by using rules of precedence and associativity.
      i) 4 / 3 + 5 – 2 + 3 / 5
      ii) 3 * 6 + 9 – 10 / 6

UNIT–III

5. a) What is an Array? Explain how to declare and initialize a one dimensional arrays in C with an example.
   b) Write code segments for displaying numbers from 1 to 10 using while, do..while and for statements.

OR

6. a) Write a C Program to check weather given number is Armstrong number or not
   b) Write a C program to accept and print the elements in a two dimensional arrays.

UNIT–IV

7. Explain about any four string handling functions with an example.

OR

8. Write a C program to find the given string is palindrome or not.

UNIT–V

9. a) What is a function? Describe different categories of function with suitable example programs.
   b) Write a C program to find factorial of a number using recursion.

OR

10. a) What is the scope of variables of type extern, auto, register and static? Explain with example.
    b) Describe any four preprocessor command with suitable examples.

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Hall Ticket Number :										

R-17

Code: 7G513

I B.Tech. I Semester Supplementary Examinations June 2022

Basic Engineering Drawing

(Computer Science and Engineering)

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

UNIT–I

1. a) Divide a straight line AB of length 50mm into 9 equal parts
   b) Construct a regular pentagon given the length of its side is 50mm

OR

2. Construct a hyperbola, when the distance of the focus from the directrix is 65mm and eccentricity is 3/2. Also draw tangent and normal to the curve as a point 45mm from directrix.

UNIT–II

3. A line PQ 90mm long is in the H.P. and makes an angle 30^0 with the V.P. its end P is 25mm in from of the V.P. draw its projections.

OR

4. A line AB 90mm long is inclined at 45^0 to the H.P. and its top view makes an angle of 60^0 with V.P. the end A is in the H.P. and 12mm in from of the VP. Draw its projections and find its true inclination with the V.P.

UNIT–III

5. 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.

OR

6. Draw rhombus of diagonals 100mm and 60mm with the longer diagonal horizontal. The figure is the top view of a square lamina of 100mm long diagonal, with a corner on HP. Draw its front view and determine the angle, its surface makes with the HP.

UNIT–IV

7. A pentagonal pyramid base 25mm side and axis 50mm long has one of its triangular faces in the VP and the edge of the base contained by that face makes an angle of 30^0 with the HP. Draw its projections

OR

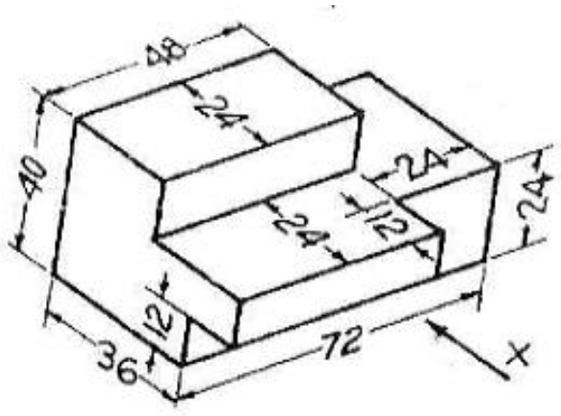
8. A hexagonal prism of side length 30mm is resting on V.P. on its base with a side perpendicular to the H.P. Draw its projections

UNIT–V

9. Draw the isometric projection of a circular plane of diameter 50mm when the plane is Horizontal

OR

10. Draw the front view, Top view and Side view of the following isometric view



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Hall Ticket Number :										

R-17

Code: 7GC12

I B.Tech. I Semester Supplementary Examinations June 2022

Engineering Chemistry

(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

UNIT–I

1. a) How do you determine dissolved oxygen present in a water sample by Winkler's method?
   b) What is external treatment of water? Write about ion-exchange resins. Explain the Ion exchange process for the treatment of industrial water.

OR

2. a) Calculate temporary and permanent hardness of water sample having composition $Ca(HCO_3)_2$ = 16.2ppm Mg $(HCO_3)_2$=14.6ppm, $CaSO_4$ = 13.6, $MgSO_4$ = 12ppm, $MgCl_2$ = 9.5ppm
   b) What is break point chlorination? State its significance.

UNIT–II

3. a) Describe the working procedure of electrochemical sensors with suitable examples
   b) i. Why does a dry cell become dead after a long time even if it has not been used?
   ii. Can we use a nickel spatula to stir a solution of copper sulphate? Give reasons
   iii. A fuel cell is considered better than an electric power plant using the same fuel. why

OR

4. a) Explain various factors that influence corrosion of metals
   b) Give reasons for the following
   i. Metal under water drop undergoes accelerated corrosion
   ii. Rusting of iron is quicker in saline water than in ordinary water
   iii. Small anodic area results in intense corrosion

UNIT–III

5. a) Differentiate between thermoplastics and thermosetting plastics
   b) Write a brief notes on Vulcanization and compounding of rubber

OR

6. a) What is latex? How natural rubber is isolated from it? What is vulcanization? How does it improve the properties of natural rubber
   b) Describe the preparation, properties and engineering applications of Buna-S and Buna-N rubbers

UNIT–IV

7. Define calorific value of a fuel? Distinguish gross and net calorific value of fuel?

OR

8. What are the characteristics of metallurgical coke? Describe the manufacture for metallurgical coke by Otto Hoffmann's byproduct method?

UNIT–V

9. a) Define lubricant? Explain any two properties of lubricants
   b) Explain thick film lubricating mechanism

OR

10. a) What is the composition of Portland cement? Describe the manufacture of Portland cement with dry method?
    b) What is setting and hardening of cement? Explain various reactions involved in setting and hardening of cement.

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