

Code No: R17A0013

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, June 2022**Engineering Chemistry**

(ME)

Roll No									
----------------	--	--	--	--	--	--	--	--	--

Time: 3 hours**Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

- 1
 - a) Explain and elaborate Nernst equation of an electrochemical cell. [4M]
 - b) Explain the mechanism of electrochemical corrosion by absorption of oxygen gas. [6M]
 - c) Discuss briefly about the controlling methods of corrosion. [4M]

- 2
 - a) Give a comparative account on primary, secondary and fuel cells with examples. [7M]
 - b) How electrolysis is useful to protect base metal from corrosion by electroplating? Write its advantages and applications. [7M]

- 3
 - a) How to calculate crystal field splitting energy for tetrahedral field? Explain. [7M]
 - b) Define atom? Explain the shapes of atomic orbitals with neat labeled diagram. [7M]

- 4
 - a) Explain molecular energy level diagrams for N₂ molecule with the neat diagram? [7M]
 - b) With the help of suitable illustrations explain the crystal field splitting of octahedral geometry? [7M]

- 5
 - a) What are the advantages and disadvantages of hard water? How temporary hardness differ from permanent hardness? [7M]
 - b) With the help of neat diagram describe the reverse osmosis method for the desalination of brackish water. [7M]

- 6
 - a) Distinguish between hard and soft water with chemical reactions. [4M]
 - b) If water contains Ca²⁺ (aq) and HCO³⁻ (aq), will it be hard water or soft water? Give reason. [2M]
 - c) Why water should not be soft for drinking purposes? [2M]
 - d) How can we increase selectivity of EDTA titration? Why we use EDTA as a standard in Complexometric titration? What are the conditions in which we use back titration? [6M]

- 7
 - a) Differentiate between Markownikoff and Anti-Markownikoff's addition reactions with example. [6M]
 - b) What is substitution reaction? Discuss with example. [3M]
 - c) Define Electrophiles? Write a short note on Electrophilic addition reactions. [5M]

- 8**
- a) What are the merits and demerits of liquid fuels? **[4M]**
 - b) What is the composition of LPG? What are the characteristics and uses of LPG? **[6M]**
 - c) Explain how fuels are classified with suitable examples. **[4M]**

Code No: R17A0201

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, June 2022

Electrical Circuits

(EEE, ECE, CSE & IT)

Roll No									
----------------	--	--	--	--	--	--	--	--	--

Time: 3 hours

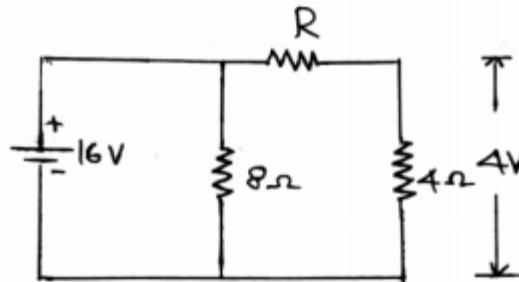
Max. Marks: 70

Answer Any **Five** Questions

All Questions carries equal marks.

1(a) What are the types of sources? Explain them with suitable diagrams and Characteristics? **[7M]**

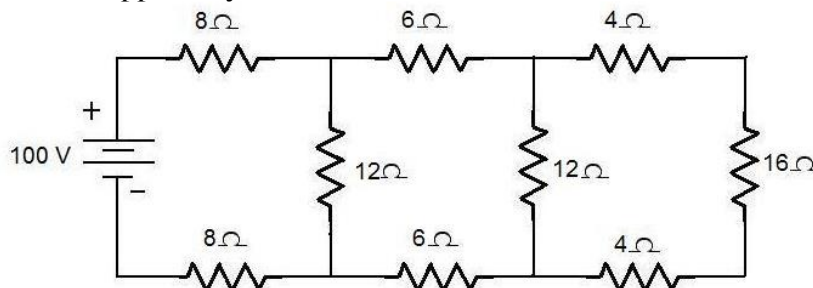
1(b) Find ‘R’ in the circuit shown below. **[7M]**



2(a) Illustrate voltage - current relationship for R,C elements. **[7M]**

2(b) Describe the source transformation and how can it be used to convert **[7M]**
 (i) a practical voltage source into a practical current source;
 (ii) a practical current source into a practical voltage source

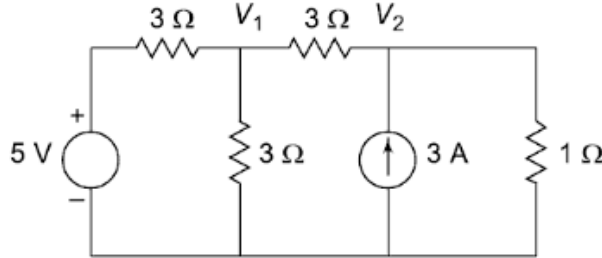
3(a) Calculate the equivalent resistances across the terminals of the supply and total current supplied by the source **[7M]**



3(b) Derive the expression for Delta connected resistances in terms of Star connected resistances? **[7M]**

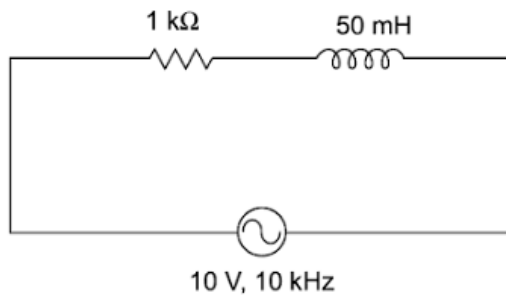
- 4(a) Define the following terms, [7M]
 (i) Link (ii) Graph (iii) Tree (iv) Node (v) Branch

- 4(b) Using nodal analysis, determine the node voltages in the following network [7M]



- 5(a) Derive the equation of average value and RMS value of sinusoidal waveform. [7M]

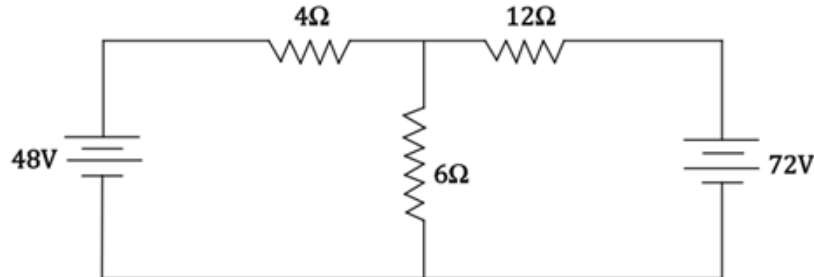
- 5(b) To the circuit shown in fig. consisting of a 1k ohm resistor connected in series with a 50mH coil, a 10V rms, 10KHz signal is applied. Find i) impedance Z, ii) current I, iii) Phase angle(θ) & iv) Voltage across R & L. [7M]



- 6(a) Illustrate the terms [7M]
 i)Active Power ii)Reactive Power iii)Apparent Power iv) Power factor

- 6(b) Illustrate the significance of j-operator. What are the different forms of expressing the sinusoidal quantity in complex form? [7M]

- 7(a) Find the magnitude and direction of current flow through 6 Ohm Resistor by Superposition Theorem as shown in Fig. [7M]



- 7(b) State and prove Compensation theorem. [7M]

- 8(a) Illustrate about the dot convention in coupled circuits. [7M]

- 8(b) Derive an expression for equivalent inductance of two coupled coils [7M]
 Coils are connected in series aiding. b) Coils are connected in series opposing

Code No: R17A0302

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, June 2022

Engineering Drawing

(ME)

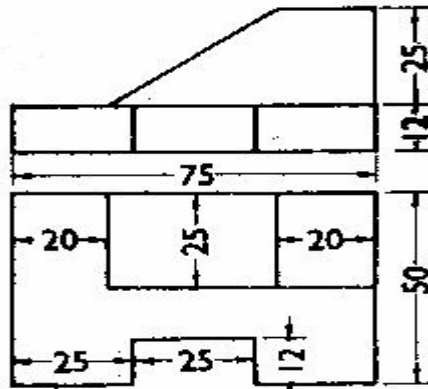
Roll No									
----------------	--	--	--	--	--	--	--	--	--

Time: 3 hours

Max. Marks: 70

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 A wheel of 50 mm diameter rolls on a straight road surface without slip. Trace the path of point of contact for one complete revolution of the wheel. [14M]
- 2 Construct a parabola with 60mm base and 40mm length of axis. Draw a tangent to the curve at a point 20mm from the base. [14M]
- 3 A line CD, 90mm long measures 72mm in front view and 65mm in top view. Draw the two views of the line if it fully lies in the first quadrant. Find the true inclination of the line. Point C lies at a distance 20mm from the reference planes. [14M]
- 4 A line BC, 80mm long is inclined at 45° to the HP and 30° to the VP. Its end B is in the HP and 40mm in front of the VP. Draw its projections and determine its traces. [14M]
- 5 Draw the projections of a rhombus, having diagonals 120mm and 60mm long, the smaller diagonal of which is parallel to both the principal planes, while the other is inclined at 30° to HP. [14M]
- 6 Draw the projections of a hexagonal pyramid, with side of base 30mm and axis 70mm long, which is resting with a triangular face on HP such that, the axis is parallel to VP. [14M]
- 7 Draw the isometric view of a square pyramid of side of base 35mm and axis 60mm when its axis is (i) Vertical and (ii) Horizontal [14M]
- 8 Draw the isometric projection of the following views as shown in figure. All dimensions are in mm. [14M]



Code No: **R17A0012****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, June 2022**Engineering Physics-II**

(Common to all branches)

Roll No									
----------------	--	--	--	--	--	--	--	--	--

Time: 3 hours**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 Describe the 7 crystal systems with diagrams and also write the relation between lattice parameters in various crystal systems [14M]
- 2 Derive an expression for the cohesive energy between atoms [14M]
- 3 Explain the powder X-ray diffraction method used for the analysis of crystal structures [14M]
- 4 Explain edge and screw dislocations with the help of Burgers vector [14M]
- 5 Explain the electronic polarizability in atoms and obtain an expression for electronic polarizability in terms of the radius of the atom [14M]
- 6 a) Derive Clausius Mostotti relation in dielectrics [7M]
b) Write a short note on Piezo electricity and Ferro electricity [7M]
- 7 a) Distinguish between Type – I and Type – II superconductors [7M]
b) Write few applications of superconductors [7M]
- 8 Explain the characterisation of nano particles by using SEM & TEM [14M]

Code No: R17A0022

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, June 2022

Mathematics-II

(Common to all branches)

Roll No									
----------------	--	--	--	--	--	--	--	--	--

Time: 3 hours

Max. Marks: 70

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 Find a positive root of the equation $x^3 - x - 1 = 0$ correct to two decimal places by using the bisection method. [14M]

- 2 Using Newton’s forward difference interpolation formula and the given table of values [14M]

x	1.1	1.3	1.5	1.7	1.9
f(x)	0.21	0.69	1.25	1.89	2.61

Obtain the value of f(x) when x=1.4

- 3 Evaluate $\int_0^6 \frac{1}{1+x} dx$, taking h=1. using [14M]

(i) Simpson 1/3 rule
(ii) Simpson 3/8 rule
and compare the result with its actual value.

- 4 Fit a second degree polynomial to the following data by the method of least squares. [14M]

x	0	1	2	3	4
y	1.0	6.0	17.0	25.0	31.0

- 5 Find a Fourier series to represent the function $f(x) = x^2$ in the interval $(0, 2\pi)$ [14M]

- 6 Find the half range sine series for $f(x) = x(\pi - x)$, in $0 < x < \pi$ and [14M]
Hence deduce that $\frac{1}{1^3} - \frac{1}{3^3} + \frac{1}{5^3} - \frac{1}{7^3} + \dots = \frac{\pi^3}{32}$.

- 7 Solve $x^2(y - z)p + y^2(z - x)q = z^2(x - y)$. [14M]

- 8 A. Find the Laplace transform of $3\cos 3t \cos 4t$ [6M]
B. Find the Laplace transform of $\frac{\sin t}{t}$ [8M]

Code No: **R17A0502****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, June 2022**Object Oriented Programming Through C++****(Common to all branches)**

Roll No									
----------------	--	--	--	--	--	--	--	--	--

Time: 3 hours**Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 State the important features of object oriented programming. Describe the major parts of C++ Program. [14M]
- 2 Write the syntax for declaring Arrays in C++. Write a C++ program demonstrating the viability of new and delete operators for a single variable as well as an array. [14M]
- 3 Write the syntax for Class and Class structure in C++. Illustrate with suitable examples. [14M]
- 4 What are Inline functions? Write a C++ program to exchange the values between two classes using friend functions. [14M]
- 5 How to include Multiple Constructors in a Class. What are recursive constructors? Explain with an example [14M]
- 6 What is inheritance? How does it enable code reusability, explain with clear examples? [14M]
- 7 How does polymorphism promote extensibility? Illustrate. With an example explain how late binding can be achieved in C++. [14M]
- 8 Write short notes on Exceptions. Write a program containing a possible exception. Use a try block to throw it and a catch block to handle it properly? [14M]
