

Code No: **R17A0013****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021**Engineering Chemistry****(ME & AE)**

Roll No									
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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 a. The resistance of a decinormal solution of a salt occupying a volume between two platinum electrodes 1.8cm apart and 5.4 cm² in area was found to be 32 ohm. Calculate the specific conductance and equivalent conductance of the solution. [4M]
[6M]
- b. Explain the measurement of pH of the given solution using glass electrode with a neat diagram.
- c. Describe the electrolyte concentration cell with a diagram indicating the cell representation and electrode reactions with an example. [4M]
- 2 a. How do you estimate a strong acid using a strong base conductometrically? Explain with the graph. [4M]
- b. What is electrochemical series? Briefly explain the applications of EMF series. [5M]
- c. Explain the working of Methanol-Oxygen fuel cell diagrammatically and mention the electrode reactions. [5M]
- 3 a. Describe the electrochemical theory of corrosion. Explain the mechanism involved in the corrosion of iron in the presence of slightly alkaline medium having dissolved oxygen. [8M]
- b. Explain the process of galvanization and tinning. [6M]
- 4 a. What is oxidation corrosion? Describe the mechanism of oxidation corrosion and explain the effect of nature of metal oxide formed on further corrosion with examples. [8M]
- b. What is the principle involved in cathodic protection? Explain the protection of ship hulls and buried pipelines with a suitable method. [6M]
- 5 a. Differentiate between thermosetting and thermoplastic resins with suitable examples. [5M]
- b. Write an account of preparation, properties and uses of [6M]
i. Dacron ii. Bakelite
- c. Out line the important characteristics of a good refractory material. [3M]
- 6 a. Describe the Vulcanisation of natural rubber. How does it improve the properties of natural rubber? [5M]
- b. Write an account of preparation, properties and uses of [6M]
i. Teflon ii. Nylon-6,6 iii. Butyl rubber
- c. Write short note on Flash and Fire point of a lubricant and mention its significance. [3M]

- 7
- a. Define Hardness of Water. Explain the different types of hardness of water with examples. [4M]
 - b. Explain the ion-exchange process for external treatment of boiler feed water softening with a neat diagram. [6M]
 - c. Describe the specifications of potable water. Write the reactions involved in the disinfection of water by chlorination. [4M]
- 8
- a. Write the composition, characteristics and applications of
 - i. LPG
 - ii. CNG[5M]
 - b. Explain the determination of calorific value by Junker's gas calorimeter [5M]
 - c. Give the composition, boiling range and uses of various fractions obtained during refining of petroleum. [4M]

Code No: R17A0201

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021

Electrical Circuits

(EEE, ECE, CSE & IT)

Roll No									
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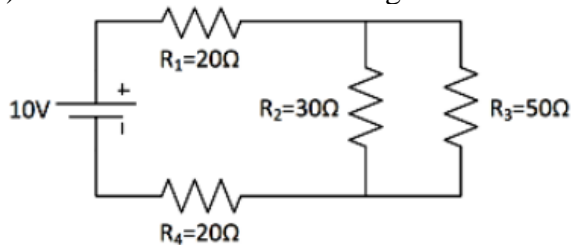
Time: 2 hours 30 min

Max. Marks: 70

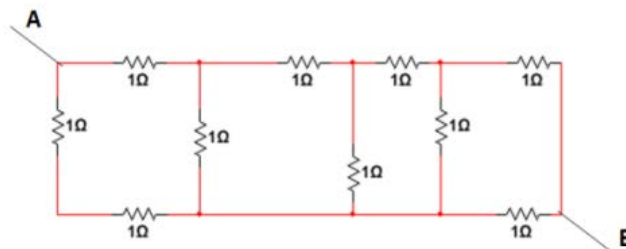
Answer Any **Five** Questions
All Questions carries equal marks.

- 1 a) Describe the types of network elements with examples. [4M]
 b) A resistance R is connected in series with a parallel circuit comprising 20 Ω and 48 Ω . The total power dissipated in the circuit is 1,000 watt and the applied voltage is 250V. Calculate R. [10]

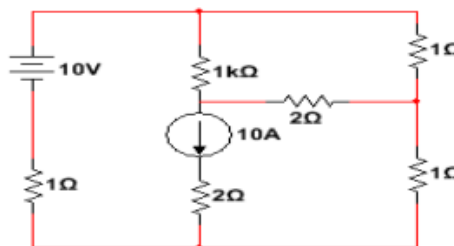
- 2 a) Find the total current flowing in the following circuit. [4M]



- b) Explain Kirchoff's Laws with an example. [10M]
 3 a) Find the equivalent resistance between A and B by using star-delta transformations. All the values are in ohms. [10M]



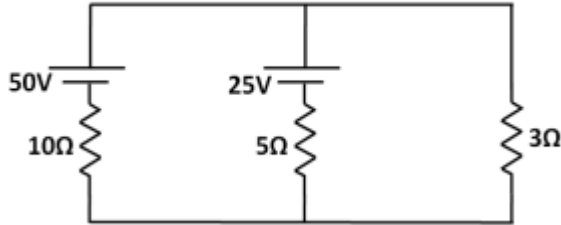
- b) Find the equivalent value of the inductor L1, L2 and L3 are connected in series and parallel. [04]
 4 a) Evaluate the mesh currents using the mesh analysis for the circuit shown in below figure. [10M]



- b) Define Graph, Tree, Cut set and Tie set Matrices for Planar Networks [04]
 5 a) A circuit consists of a series connected resistance of 10 ohms a capacitance of 150μ F and an inductance of 16mH connected across a supply of 100V at 50Hz. Evaluate (a) circuit current (b) power factor and (c) power consumed by the circuit. Draw the [10M]

phasor diagram.

- b) Explain the average and R.M.S value? [04M]
- 6 a) Derive the Steady State Analysis of series R-L circuits [10M]
b) Define: Reactance, Impedance, Susceptance and Admittance [04M]
- 7 a) State and explain Thevenin's theorem with an example. [07M]
b) Apply the principle of super position theorem to the network shown below to find out the current in all the resistors. [07M]



- 8 (a) Two coils are placed side by side. The combined inductance when connected in series is 1H or 0.2H depending on the relative direction of current in the coils. Calculate the mutual inductance and self inductance of a coil when the other coil self inductance is 0.2H. [10M]
- (b) Explain about series aiding and series opposition of Inductors? [04M]

Code No: R17A0302

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

I B.Tech II Semester Supplementary Examinations, February 2021
Engineering Drawing
(ME & AE)

Roll No									
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Time: 2 hours 30 min

Max. Marks: 70

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

- 1 A coin of 35 mm diameter rolls over dining table without slipping. A point on the circumference of the coin is in contact with the table surface in the beginning and after one revolution. Draw the curve traced by the point, also draw the tangent and normal at any point on the curve. [14M]

- 2 The vertex of hyperbola is 65mm from its focus. Draw the curve if the eccentricity is 3/2. Draw the normal and a tangent at a point on the curve 75mm from the directrix [14M]

- 3 A line AB, 90mm long, is inclined at 45° to the HP and its top view makes an angle of 60° with the VP. The end A is in the HP and 12mm in front of VP. Draw its front view and find its true inclinations with the VP. [14M]

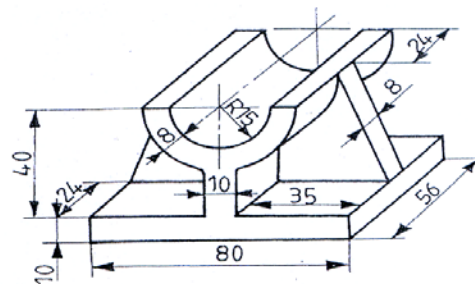
- 4 A line PQ 75mm long, has its end in the VP and the end Q in the HP. The line is inclined at 30° to the HP and at 60° to the VP. Draw its projections. [14M]

- 5 Draw the projections of a regular pentagon plane of 25mm side, with its surface making an angle of 45° with HP. One of the sides of the pentagon is parallel to HP and 15 mm away from it [14M]

- 6 Draw the projections of a hexagonal prism, base 25 mm side and axis 50 mm long, resting on one of its rectangular faces on HP, With the axis inclined at 45° to the VP [14M]

- 7 Draw the three possible ways of representing the isometric projection of a hexagonal prism, side of base 25mm and height 60mm. [14M]

- 8 Draw the front and top views of the block shown in figure [14M]



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

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021**Engineering Physics-II****(Common to all branches)**

Roll No										
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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions
All Questions carries equal marks.

- 1 (a) Distinguish between Primary and Secondary bounds. [7M+7M]
(b) Draw neat diagram of types of crystal systems.
- 2 (a) Derive the expression for Interplanar distance. [7M+7M]
(b) Calculate packing factor of BCC structure.
- 3 (a) Discuss powder method of X-ray diffraction. [7M+7M]
(b) Estimate number of Schottky defects at a given temperature.
- 4 (a) What are edge and screw dislocations? Explain in detail. [7M+7M]
(b) Estimate number of Frenkel defects at a given temperature.
- 5 (a) Derive an expression for Clausius Mosotti relation. [8M+6M]
(b) Write a note on Piezo electricity.
- 6 (a) Derive an expression for Ionic polarizability. [8M+6M]
(b) Write a note on (i) Electric susceptibility (χ) (ii) Polarization vector (P).
- 7 (a) Explain Hysteresis loop on the basis of domain theory of ferromagnetism. [8M+6M]
(b) Illustrate Meissner effect.
- 8 (a) Write a note on types of Nano materials. [6M+8M]
(b) Discuss fabrication of nanomaterials by using Physical Vapour Deposition method.

Code No: R17A0014**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY****(Autonomous Institution – UGC, Govt. of India)****I B.Tech II Semester Supplementary Examinations, February 2021****Environmental Studies****(EEE, ECE, CSE & IT)**

Roll No									
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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 Define Eco-System. Explain the structure and functions of an eco-system with Suitable examples. [14M]
- 2 What are Bio-Geo Chemical Cycles? Write a detailed note on one gaseous cycle and sedimentary cycle with a neat diagram. [14M]
- 3
 - a. Classify the Resources. Discuss the advantages and disadvantages of Dams. [05M]
 - b. Over utilization of ground and surface water bodies have an adverse impact on environment – Justify with your answer [09M]
- 4
 - a. Deforestation is one of the main cause for Climate change – Explain in your words with examples. [07M]
 - b. Write a detailed note on alternative energy resources and its use to human society. [07M]
- 5 Biodiversity plays an important role in the maintenance of ecological balance in terms of consumptive, social, productive use values – explain. [14M]
- 6
 - a. Explain in detail about role of in- situ and ex-situ conservation in Biodiversity Protection. [09M]
 - b. Discuss the major causes for loss Biodiversity. [05M]
- 7 What are the major sources of Water Pollution? Explain the various water treatment methods with a neat diagrams. [14M]
- 8 Explain the salient features of Bio-medical waste (Management and Handling) Rules. [14M]

Code No: R17A0022

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021

Mathematics-II

(common to all branches)

Roll No									
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Time: 2 hours 30 min

Max. Marks: 70

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

- 1 a) Find a real root of the equation $x^3 - 2x^2 - 4 = 0$ using iteration method. [7M]
 b) Prove that $\sqrt{1 + \delta^2 \mu^2} = 1 + \frac{\delta^2}{2}$ [7M]
- 2 a) Find a real root of the equation $3x - \cos x - 1 = 0$ using Newton Raphson method. [7M]
 b) Find f(2.36) from the following table [7M]

x	1.6	1.8	2.0	2.2	2.4	2.6
f(x)	4.95	6.05	7.39	9.03	11.02	13.46

- 3 a) Fit a second degree polynomial to the following data by method of least squares: [7M]

x	-1	0	1	2
y	-2	1	2	4

- b) Find y(0.1) given $\frac{dy}{dx} = \frac{y-x}{y+x}$ $y(0) = 1$ by Picard's method [7M]
- 4 a) Find y(0.1) and y(0.2) using Euler's formula given that $\frac{dy}{dx} = x^2 - y$, $y(0) = 1$ [7M]
 b) Fit a straight line to the following data [7M]

x	0	1	2	3	4
y	1	1.8	3.3	4.5	6.3

- 5 a) Obtain the Fourier series for $f(x) = x^2$ in $[0, 2\pi]$. [7M]
 b) Find the half range cosine series for the function $f(x) = (x - 1)^2$ in the interval $0 < x < 1$. Hence show that $\frac{\pi^2}{8} = \sum_{n=1}^{\infty} \frac{1}{(2n-1)^2}$ [7M]
- 6 a) Find the Fourier series expansion for function $f(x) = \sin x$, $-\pi < x < \pi$ [10M]
 b) Find the half range sine series for $f(x) = e^x$, in $0 < x < 1$ [4M]

- 7 a) Solve $(y - z)p + (x - y)q = (z - x)$ [7M]
b) Solve $p^2 + q^2 = z$ [7M]
- 8 a) Find the Laplace Transform of $\frac{1 - \cos t}{t}$ [7M]
b) Find $L^{-1} \left\{ \frac{1}{(s^2 - 9)(s - 5)} \right\}$ [7M]

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

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021**Object Oriented Programming Through C++****(Common to all branches)**

Roll No										
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Time: 2 hours 30 min**Max. Marks: 70**

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

- 1** a) Distinguish the OOP from procedure oriented programming. [7M]
b) List out the benefits of OOPs. [7M]
- 2** a) Illustrate the implicit and explicit type conversions with examples. [6M]
b) Relate the following terms. [8M]
i) Objects and classes
ii) Data abstraction and data encapsulation
iii) Inheritance and polymorphism
iv) Dynamic binding and message passing.
- 3** a) Design a C++ program to implement Inline function. [8M]
b) Interpret the class scope and memory allocation of objects. [6M]
- 4** a) Construct a C++ program to exercise a concept of default argument. [10M]
b) Summarize the static data member and member functions [4M]
- 5** Build a C++ program to showcase the results of various types of constructors. [14M]
- 6** Demonstrate about multiple and hybrid Inheritance with neat example. [14M]
- 7** a) Give details about the memory management. [7M]
b) Implement the concept of pointers to object. [7M]
- 8** a) Explain about the class template with multiple parameters [7M]
b) Describe about overloading of template functions. [7M]
