

Code No: **R20A0001****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**English****(Common to ALL)**

Roll No										

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

All Questions carries equal marks.

1. “The Road Not Taken” is considered one of the finest poems of Robert Frost. Write a detailed summary of the poem and the implicit message it provides. [14M]
2. a) What are the principles of writing a paragraph? [7M]
b) Write a short descriptive paragraph on your favourite holiday destination. [7M]
3. a. Abraham Lincoln’s letter to his son’s teacher is a reflection of his deep insights into the process and the purpose of education. Justify in the light of your understanding. [7M]
b. Discuss the structure of the essay, introduction, body and conclusion, with relevant examples. [7M]
- 4 a) What are the simple rules to be followed for conversion of sentences from direct to indirect speech. [7M]
b) Complete the second sentence in the following pairs with the antonyms of the word highlighted in the first sentence. [7M]
 - i. We were **excited** about going to the concert.
She was _____ because there were many grammar exercises.
 - ii. She is **beautiful** and wants to be a model.
A witch is normally very _____.
 - iii. The party next door was **noisy**.
The mountains are very _____ when it snows.
 - iv. There was only enough space for one car on the **narrow** road.
The main avenue of the city was very _____.
 - v. I didn't feel a thing. It was **painless**.
Having a tooth removed can be _____.
 - vi. The lights didn't work, so it was very **dark**.
The sun was out in the middle of the day so it was very _____.
 - vii. Imported technology is **expensive**.
Native technology is _____.
5. Discuss the simple guidelines for converting sentences from active to passive voice. Convert the following active voice sentences into passive. [14M]

- i. Rama rescued all the birds.
- ii. Only three students handed in the assignments.
- iii. Jaya crashed into the white car.
- iv. Pranay learned the poem by heart.
- v. Raman has left behind the book.
- vi. The technician has not fixed the mobile phone.
- vii. All my cousins played chess.

6. What is the significance of JK Rowling’s “Harvard Address”? What are some important take aways for you from it? [14M]

7 a) Complete the following sentences using appropriate articles wherever necessary. [7M]

1. I am university student.
a an the
2. She goes to the temple in mornings.
a the No article
3. . Kiran is best student in the class.
a the No article
4. This book has won Booker prize.
a the No article
5. Naren is honest person.
a an the
6. I am fond of classical music.
a the No article
7. Gold is precious metal.
a an the

b) What is difference between a verb and a phrasal verb? Disuss with the help of some sample phrsal verbs. [7M]

8. Use the following pairs of commonly confused words in your sentences. [14M]

- i. Cite-Site ii. Formally-Formerly iii. Lightening-Lightning iv. Eminent-Imminent
- v. Stationary-Stationery vi. Advice-Advise vii. Complement-Compliment

Code No: R20A0021

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**Mathematics-I**

(Common to ALL)

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

Time: 3 hours

Max. Marks: 70

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

- 1 Define rank of a matrix, Reduce the matrix $A = \begin{bmatrix} 1 & -1 & 2 & -3 \\ 4 & 1 & 0 & 2 \\ 0 & 3 & 0 & 4 \\ 0 & 1 & 0 & 2 \end{bmatrix}$ to normal form [14M]
and hence determine its rank.
- 2 Verify Cayley Hamilton theorem for the matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ 1 & 2 & -1 \\ 1 & -2 & 2 \end{bmatrix}$ and find the [14M]
inverse of A .
- 3 Find the minimum value of $x^2 + y^2 + z^2$ given that $ax + by + cz = p$. [14M]
- 4 Find $\frac{\partial(u, v, w)}{\partial(x, y, z)}$ where $u = x^2 + y^2 + z^2$, $v = xy + yz + zx$, $w = x + y + z$. [14M]
- 5 A body kept in air with temperature $25^{\circ}C$ cools from $140^{\circ}C$ to $80^{\circ}C$ in 20min. [14M]
Find when the body cools down to $35^{\circ}C$ also find what will the temperature of the
body after 40 minutes from the original.
- 6 A bacteria culture, growing exponentially increases from 100 to 400 grams in 10 [14M]
hours. How much bacteria was present after 3 hours?
- 7 Solve $(D^2 - 5D + 6)y = xe^{3x}$. [14M]
- 8 (a) Find $L\{e^{4t} \sin 2t \cos t\}$. [7M]
(b) Find $L\{3 \cos 4(t-2)u(t-2)\}$ [7M]

Code No: **R20A0501****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**Programming for Problem Solving**

(Common to ALL)

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

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

All Questions carries equal marks.

- 1 a) Pictorially represent and explain the basic structure of 'C'. [8M]
b) Develop a 'C' program to find the largest of three numbers using conditional statement. [6M]
- 2 a) Write a program to find sum of the individual digits of a given number. [5M]
b) Deliberate about the following operators in C language with example. [3M]
i. Bitwise operators [3M]
ii. Increment and decrement operators [3M]
iii. Logical operators [3M]
- 3 a) Explain declaration and initialization of I-D array. [7M]
b) What is pointer? Explain how the pointer variable declared and initialized. [7M]
- 4 a) Elucidate different Categories of user defined functions. [7M]
b) Classify the types of storage classes they do C supports? What is the necessity of each? [7M]
- 5 a) Illustrate the actual arguments and formal argument in functions. Give contrasts lies between these arguments. Identify the rules to call a function in a main function. [7M]
b) Implement a 'C' program find the greatest common divisor (GCD) of two numbers using a recursive functions. [7M]
- 6 a) Describe about dynamic memory management functions. [7M]
b) Implement the call by value and call by reference techniques in 'C' programming language. [7M]
- 7 a) Write a 'C' program to demonstrate passing structures through pointers. [7M]
b) Construct a program to find the average marks obtained by a class of 50 students in a test. [7M]
- 8 Build a 'C' program to implement the stack and perform push and pop operation. Also write a function to display the content of stack after each operation. [14M]

Code No: R20A0201

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021

Basic Electrical Engineering

(CSE, IT, CSE-CS, CSE-AI&ML, CSE-DS & CSE-IOT)

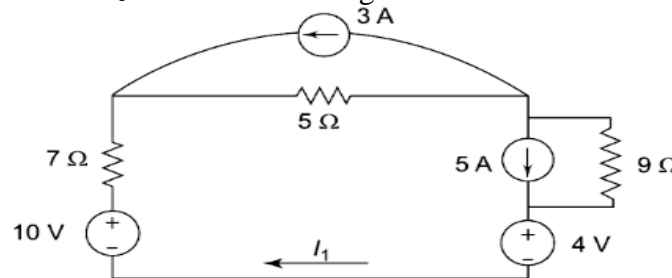
Roll No									
---------	--	--	--	--	--	--	--	--	--

Time: 3 hours

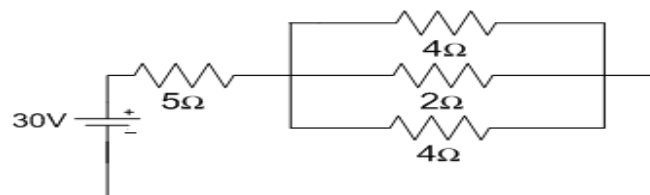
Max. Marks: 70

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

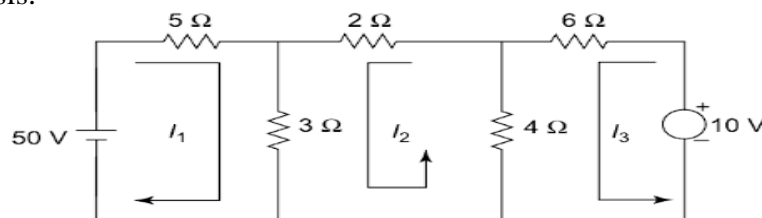
- 1(a) Illustrate KVL & KCL with an example. [7M]
 (b) Determine the value of I_1 in the circuit using source transformation technique. [7M]



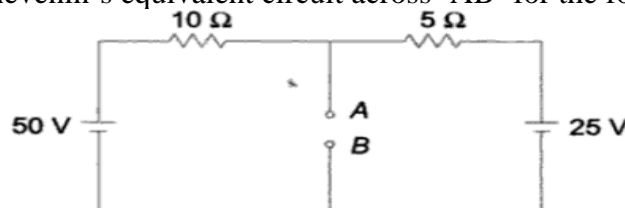
- 2(a) Define Ohm's Law and List the applications of it. [7M]
 (b) Determine the total current in the circuit [7M]



- 3(a) Determine the power dissipation in 4Ω resistor of the circuit shown in the fig. using mesh analysis. [7M]

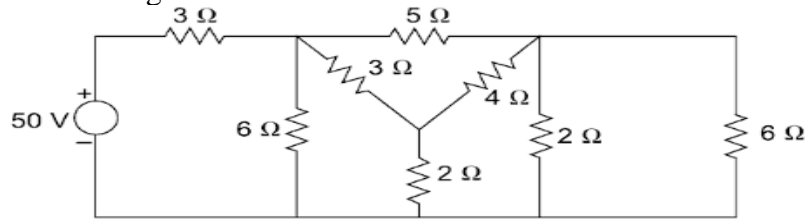


- (b) Determine the Thevenin's equivalent circuit across 'AB' for the following network [7M]



- 4(a) State super position theorem with an example. [7M]

- (b) Using star- delta transformation, determine the current drawn by the source in the circuit shown in the fig. [7M]



- 5(a) Determine the average value and rms value of the waveform shown in the fig. [7M]



- (b) An inductive coil having negligible resistance and 0.1H inductance is connected across an AC supply of 220V, 50Hz. Calculate (i) Inductive reactance (ii) RMS value of Current (iii) Power factor (v) write down the equations for voltage and current. [7M]

- 6(a) Illustrate the crest factor and form factor of a sine-wave. [7M]

- (b) An AC circuit consists of a pure resistance of 10Ω and is connected across an AC supply of 230V, 50Hz. Calculate (i) Current (ii) Power consumed (iii) Power factor (iv) write down the equations for voltage and current. [7M]

- 7(a) Describe the Faraday's law of electro-magnetic induction principle. [7M]

- (b) Discuss the elementary concept of a generator. [7M]

- 8(a) Illustrate the operation of Miniature Circuit Breaker (MCB) [7M]

- (b) Describe various types of cables used in the electrical systems. [7M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021

Computer Aided Engineering Graphics

(CSE)

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

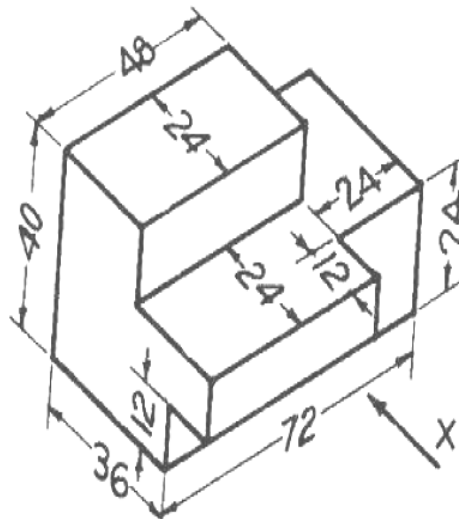
Time: 3 hours

Max. Marks: 70

Answer Any **Five** Questions

All Questions carries equal marks.

- Q.1** A Divide a 100 mm long straight line into eleven equal parts. [7M]
 B A plot of ground is in the shape of a rectangle 110m×50m. Inscribe an elliptical lawn in it. [7M]
- Q.2** A Construct a regular hexagon of 30 mm radius by using inscribe and circumscribe method. [7M]
 B Divide a circle of 50 mm diameter twelve equal parts. [7M]
- Q.3** Draw the projections of the following points on a common reference line keeping the distance between their projectors 30 mm apart. [14M]
 A. Point A is 10 mm below the H.P. and 30 mm in front of the V.P.
 B. Point B is in the H.P. and 30 mm behind the V.P.
 C. Point C is 30 mm in front of the V.P. and in the H.P.
 D. Point D is 40 mm above the H.P. and 30 mm behind the V.P.
 E. Point E is 20 mm below the H.P. and 30 mm behind the V.P.
 F. Point F is in the V.P. and 30 mm below the H.P.
 G. Point H is in both HP and VP.
- Q.4** A line AB of 100 mm length is inclined at 30° to HP and 45° to VP. The point A is 15 mm above HP and 20mm in front of VP. Draw the projections of the line. [14M]
- Q.5** Draw the projections of a circle of 50mm diameter resting in the H.P on a point A on the circumference, its plane inclined at 45° to the HP and the top view of the diameter AB making 30° angle with the V.P. [14M]
- Q.6** A Draw the projections of a hexagonal pyramid, base 30 mm side and axis 60 mm long, having its base on the HP. and one of the edges of the base inclined at 45° to the V.P. [7M]
 B Draw the projections of a pentagonal pyramid axis 50 mm long, base 40 mm side having base on the ground and one of edges of base inclined at 45° to V.P. [7M]
- Q.7** Draw an isometric view of a hexagonal pyramid of side of base 30 mm and height 75 mm, when it is resting on HP such that an edge of the base is parallel to VP. [14M]
- Q.8** Draw the elevation, plan and side view for the following Figure [14M]



Code No: **R20A0302****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**Computer Aided Engineering Graphics**

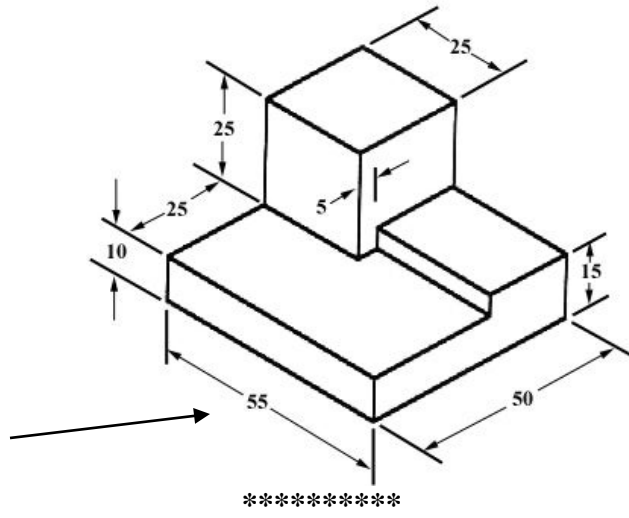
(CSE-CS, CSE-AI&ML, CSE-DS & CSE-IOT)

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

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

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

- 1 A Draw a circle of 80 mm diameter and divide six equal parts [7M]
 B Construct the following regular polygons in circle of 80 mm diameter, using a [7M]
 different method in each case. A) pentagon B) Hexagon
- 2 A Draw an ellipse with major axis of an ellipse is 100 mm and minor axis is 70 [7M]
 mm long
 B Draw exterior and interior tangents connecting two circles of radii 20 mm and [7M]
 40 mm having their centers 100 mm apart.
- 3 Draw the projections of the following points on a common reference line [14M]
 keeping the distance between their projectors 25 mm apart.
 A. Point A is 20 mm below the H.P. and 40 mm in front of the V.P.
 B. Point B is in the H.P. and 30 mm behind the V.P.
 C. Point C is 40 mm in front of the V.P. and in the H.P.
 D. Point D is 50 mm above the H.P. and 25 mm behind the V.P.
 E. Point E is 20 mm below the H.P. and 50 mm behind the V.P.
 F. Point F is 50 mm above the H.P. and 40 mm In front of the V.P.
- 4 A Straight line AB has its end A at 25 mm above the H.P and 30 mm in front [14M]
 of V.P and other end B is 80mm above the H.P and 60 mm in front of V.P if
 the end projectors are 60 mm apart. Draw the projections of the line. Determine
 true length and true inclination with reference planes.
- 5 A Hexagonal plane of 40 mm side is resting on a side in H.P and its surface [14M]
 makes an angle of 30° to H.P and perpendicular to V.P. Draw the
 projections.
- 6 A pentagonal pyramid having base with 30 mm side and 75 mm long axis, has [14M]
 edge of its base on the H.P. Its axis is parallel to the V.P. and inclination at 45°
 to the H.P. Draw its projections.
- 7 A Draw the isometric view of a hexagon of side 30 mm whose surface is parallel [7M]
 to the H.P and a side parallel to the V.P
 B Draw the isometric view of a Circle (Isocircle) with a 50mm Diameter on all [7M]
 three Principle Planes
- 8 Draw the (i) Front view (ii) Top View (iii) Side view of the Following [14M]
 Isometric Drawings



Code No: **R20A0401****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**Analog and Digital Electronics****(EEE & ECE)**

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

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

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

- 1 Describe the VI characteristics of diode and their temperature dependence with relevant expressions and diagrams [14M]
- 2 Illustrate the working and characteristics of PN junction diode under forward bias and reverse bias with relevant diagrams, represent the static and dynamic resistance of the diode in the characteristic curve. [14M]
- 3 Explain working of transistor in common base configurations and draw its input and output characteristics, derive the expression for output current. [14M]
- 4
 - a) Derive relation between α , β and γ [6M]
 - b) Describe the working of PNP transistor [8M]
- 5
 - a) Write the differences between BJT, FET and MOSFET [8M]
 - b) Draw and explain structure of n- channel JFET [6M]
- 6
 - a) Draw the Small signal model of JFET [4M]
 - b) Draw and explain the characteristics of n-channel enhancement MOSFET [10M]
- 7
 - a) Convert $(1A05.2C4)_{16}$ into binary, decimal and octal [6M]
 - b) Simplify using postulates and theorems of Boolean algebra [8M]
 - i) $(X+Y^1+XY)(X+Y^1)X^1Y$
 - ii) $(AB+C+D)(C^1+D)(C^1+D+E)$
- 8
 - a) Simplify the Boolean equation $F(X,Y,Z,W)=\Sigma m(0,1,4,5,6,13,14,15)$ using k-map [8M]
 - b) Implement the full Subtractor circuit using half subtractor and justify with Boolean expressions. [6M]

Code No: R20A0011

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**Applied Physics****(EEE & ECE)**

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

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

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

- 1 a) Give the construction working and application of He-Ne Lasers. [10M]
b) Write any four applications of Lasers. [4M]
- 2 a) Explaining the terms Acceptance angle and Numerical Aperture, derive expressions for the same. [10M]
b) For the light launched from water of refractive index 1.33 into an optical fiber with refractive indices of core 1.5 and cladding 1.45, determine the acceptance angle and numerical aperture. [4M]
- 3 a) Explain in detail the deBroglie hypothesis [10M]
b) Give the first three energy values for a particle (electron) bound in a 1D box of 5nm [4M]
- 4 a) Deduce the Time Independent Schrodinger wave equation. [7M]
b) Give the experiment of GP Thompson to prove the existence of matter waves. [7M]
- 5 a) Discuss the Kronig-Penny model for electron propagating through a periodic potential and energy band formation. [10M]
b) Classify metals, semiconductors and insulators [4M]
- 6 a) Discuss the drawbacks of classical free electron theory and explain how quantum mechanics is answering the drawbacks. [7M]
b)) Derive an expression for the density of states. [7M]
- 7 a) What are Intrinsic and extrinsic semiconductor? [4M]
b) Derive an expression for concentration of Conduction band electrons of an intrinsic semiconductor. [10M]
- 8 a) What is polarizability and derive an expression for the ionic polarizability of a dielectric. [8M]
b) Differentiate anti ferro and ferrimagnetic materials. [6M]

Code No: **R20A0302****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**Computer Aided Engineering Graphics****(IT)**

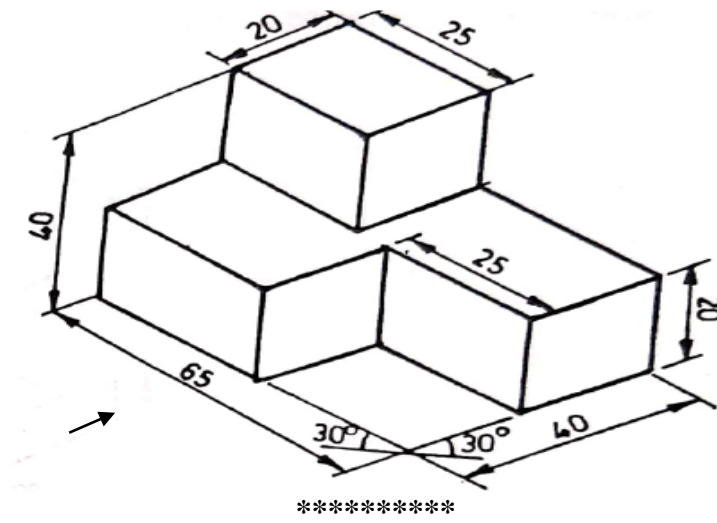
Roll No									
----------------	--	--	--	--	--	--	--	--	--

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

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

- 1** a Draw a straight line CD of 75 mm long line into six numbers of equal parts. **[7M]**
- b Bisect a given 120° angle between two lines. **[7M]**
- 2** a Construct a Regular hexagon having 40 mm sides, using general method. **[7M]**
- b Inscribe a regular hexagon about a given circle of radius 20 mm. **[7M]**
- 3** Draw the projections of the following points on a common reference line **[14M]**
keeping the distance between their projectors 30 mm apart.
- a) Point A is 20 mm below the H.P and 50 mm in front of the V.P
- b) Point B is in the H.P and 40 mm behind the V.P.
- c) Point C is 30 mm in front of the V.P and in the H.P
- d) Point D is 50 mm above the H.P and 30 mm behind the V.P
- e) Point E is 20 mm below the H.P and 50 mm behind the V.P
- f) Point F lies on both the reference planes.
- g) Point G 30 mm above HP and 20 mm in front of VP
- 4** a A straight line AB 50 mm long makes an angle of 30° to HP. The end A is 12 mm above the HP and 15 mm in front of the VP. Draw the top view and front view of the line AB. **[7M]**
- b A line AB 50 mm long makes an angle 45° to the VP. The end A is 15 mm in front of VP and 12 mm above the HP. Draw the top view and front view of the line AB. **[7M]**
- 5** a A hexagonal lamina of 40 mm side is resting on one of its corner on the HP. Its plane is inclined at an angle of 30° to HP and perpendicular to VP. Draw its projections. **[7M]**
- b Draw the projections of a circular lamina of 50 mm diameter, whose centre is 30 mm from HP and 20 mm in front of VP. The circular lamina is inclined at angle of 30° to HP and perpendicular to VP. **[7M]**
- 6** A pentagonal pyramid side of base 25 mm and height 45 mm is resting on one of its triangular face on horizontal plane with its axis parallel to VP. Draw its projections. **[14M]**
- 7** A Hexagonal pyramid of base side 30 mm and axis 60 mm long is resting on a face on the H.P. with axis parallel to the V.P. Draw its isometric view **[14M]**

- 8 Draw (i) front view (ii) Top view (iii) Side view of an object shown [14M]
below.



Code No: **R20A0013****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**Advanced Material Chemistry**

(ME & AE)

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

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

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

- 1 a) What are Fuel cells? Write the construction and reactions involved in the H_2-O_2 fuel. [7M]
b) Explain the construction and cell reactions of Lead acid battery. [7M]
- 2 a) Derive Nernst equation single electrode potential. Discuss its applications. [7M]
b) Define Primary battery. Explain the Lithium ion battery construction and cell reactions in detail. [7M]
- 3 a) What is Electrochemical corrosion? Write the different types of Electrochemical corrosion. [10M]
b) Explain sacrificial anodic type of Cathodic protection. [4M]
- 4 a) How are metals protected by metallic coating? Explain Galvanising and Tinning. [7M]
b) Explain Pilling-Bedworth rule? Write its significance. [7M]
- 5 a) Write short notes Carbon reinforced plastics and Glass reinforced plastics. [4M]
b) How are the following polymers synthesized? Write their applications. [10M]
i. Bakelite ii. PVC iii. Teflon
- 6 a) What are conducting polymers? Explain the advantages of doping in polyacetylene. [10M]
b) What are Fiber reinforced Plastic (FRP) and write their important applications. [4M]
- 7 a) Discuss Sol-gel and Chemical vapour deposition method of preparation of Nanomaterials. [7M]
b) Write the applications of Magneto strictive materials and Electro strictive materials. [7M]
- 8 a) What is Beer -Lambart Law? Explain in detail. [7M]
b) Calculate the molar absorptivity of a 1×10^{-4} M solution, which has an absorbance of 0.20, when the path length is 2.5 cm. [7M]

Code No: **R20A0012****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Regular Examinations, July 2021**Engineering Physics**

(ME & AE)

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

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

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

- 1 a). What is forced damped harmonic oscillator? Derive an expression for equation of motion of a forced damped harmonic oscillator. [10M]
b). Describe energy decay in damped harmonic oscillator? [4M]
- 2 a). Derive equations for over, critical and lightly damped harmonic oscillator. [10M]
b) What are the characteristics of simple harmonic motion? [4M]
- 3 a) Distinguish between Fresnel and Fraunhofer diffraction. [4M]
b) Explain Fraunhofer diffraction due to single slit.. [10M]
- 4 a) Derive an expression for interference in thin film by of reflected light. [10M]
b). Distinguish between division of wave front of light and division of amplitude of light. [4M]
- 5 a) With neat diagram explain Kronig – Penny modal. [10M]
b) Draw E – K diagram and explain in detail. [4M]
- 6 a) Write a note on Density of states. [10M]
b) Describe Bloch's theorem. [4M]
- 7 a) Explain classification of dia, para and ferro magnetic materials on the basis of magnetic moment. [7M]
b) What is Electronic polarizability? Derive an equation for Electronic polarizability. [7M]
- 8 a) With neat diagram explain working principle of He-Ne gas laser. [10M]
b) Write a note on Types of Optical fibers. [4M]
