R18

Code No: R18A0012

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

Applied Physics

(ECE, CSE, IT)

Roll No										

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

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

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1		Obtain expressions for energy levels and wave functions of a particle enclosed in one dimensional box of infinite length	**[14M]**
2		Describe G.P Thomson experiment to prove the wave nature of electrons	**[14M]**
3	a.	Discuss qualitatively how band theory of solids leads to the classification of solids into conductors, semiconductors and insulators	**[4M]**
	b.	Derive an expression for Density of states.	**[10M]**
4	a)	What is Bloch theorem? Explain	**[7M]**
	b)	Write the conclusions given by Kronig-Penny Model	**[7M]**
5		State and explain Hall effect? Derive an expression for Hall coefficient	**[14M]**
6	a)	Distinguish between Intrinsic and Extrinsic semiconductors	**[7M]**
	b)	What are direct and indirect bandgap semiconductors	**[7M]**
7		Explain electronic polarizability in atoms and obtain an expression for electronic polarizabilty in terms of radius of the atoms	**[14M]**
8		Define Acceptance angle and Numerical aperture of an optical fiber and derive an expression for Numerical aperture	**[14M]**

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R18

Code No: R18A0261

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

Basic Electrical and Electronics Engineering

(ME & AE)

Roll No										

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

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

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1 (a) What is the difference between an ideal source and a practical source? Draw the relevant characteristics of the above sources. **[7M]**

(b)Explain the difference between active elements and passive elements with suitable examples. **[7M]**

2 a) Explain Kirchhoff's Laws. **[7M]**

b) Explain Ohm's law. What are the limitations of Ohm's law. **[7M]**

3 a) Find current in the 15 Ω resistor using mesh method. **[7M]**

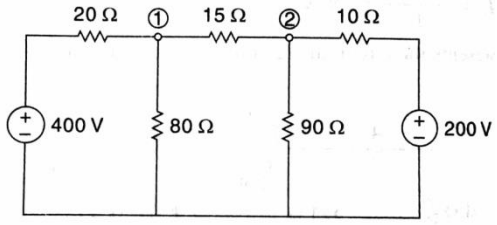

Fig. *Circuit*

b) Explain Norton's theorem with example. **[7M]**

4 a) Determine the resistance between points A and B in the network shown in Fig. **[7M]**

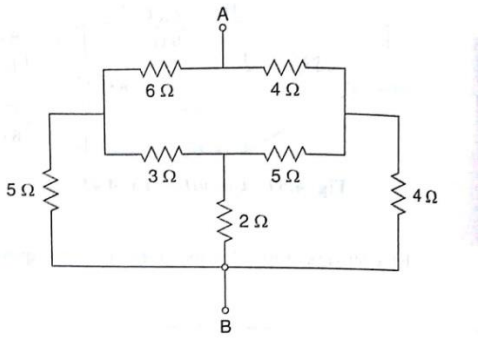

Fig. *Circuit*

b) Explain Superposition theorem with example. **[7M]**

5 a) Explain the working principle of DC Generator? **[7M]**

b) Derive EMF equation of a DC generator. **[7M]**

6	a)	Derive the emf equation of a transformer.	**[7M]**
	b)	Derive the torque equation of DC motor.	**[7M]**
7	a)	Explain the operation of PN junctions diode with V-I characteristics.	**[10M]**
	b)	Write the difference between half wave rectifier and full wave rectifier	**[4M]**
8	a)	How transistor acts as an amplifier	**[7M]**
	b)	Explain CE configuration of BJT	**[7M]**

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Code No: R18A0013 **R18**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I 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.

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1	a) Explain the construction and working of a Lead acid battery	**[7M]**
	b) List out various potentiometric titrations.	**[7M]**
2	a) Differentiate sacrificial anodic and impressed current cathodic methods in controlling the corrosion of metals.	**[7M]**
	b) Galvanised sheets are not advised in making utensils. Give reason.	**[7M]**
3	a) Distinguish atomic and molecular orbitals.	**[7M]**
	b) Write postulates of Molecular Orbital Theory.	**[7M]**
4	a) Explain the crystal field splitting of d-orbitals in Tetrahedral Complex.	**[7M]**
	b) Applying molecular orbital theory construct the energy level diagram of O_2 molecule.	**[7M]**
5	a) Distinguish temporary and permanent hardness.	**[7M]**
	b) Explain various steps in the treatment of Potable water.	**[7M]**
6	Explain desalination of water by reverse osmosis.	**[14M]**
7	a) Explain the mechanism in the oxidation of alcohols.	**[7M]**
	b) Compare SN1 and SN2 reactions.	**[7M]**
8	a) List out the characteristics of a good fuel.	**[7M]**
	b) Compare solid, liquid and gaseous fuels.	**[7M]**

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R18

Code No: R18A0301

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

Engineering Graphics

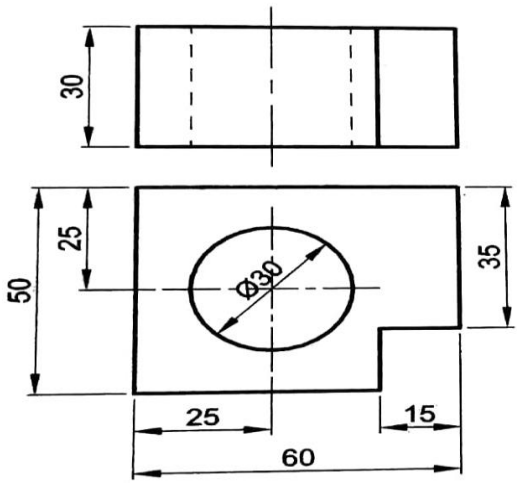
(ECE, CSE & IT)

Roll No										

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

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

1	Draw a cycloid of a circle of diameter 50mm for one revolution. Also, draw a tangent and normal to that curve at a point 35mm above the base line.	[14M]
2	Construct a plain scale of 1:40 to read meters and decimeters and long enough to measure up to 6 meters. Mark a distance 4.7 m on it.	[14M]
3	A point P is 15 mm above the H.P. and 20 mm in front of the V.P. Another point Q is 25 mm behind the V.P. and 40 mm below the H.P. Draw projections of P and Q keeping the distance between their projectors equal to 90 mm. Draw straight lines joining (i) their top views and (ii) their front views.	[14M]
4	An 80 mm long line PQ has the end Q lying both in the H.P. and V.P. The line is inclined at 30^0 to H.P. and 45^0 to the V.P. Draw its Projections.	[14M]
5	A pentagonal plane of side 30 mm has an edge in the V.P. The surface of the plane is inclined at 45^0 to the V.P. and the edge on which it rests is inclined at 30^0 to the H.P. Draw its projections.	[14M]
6	A semi circular plane of diameter 70 mm has its straight edge on the V.P. and inclined at 30^0 to the H.P. Draw the projections of the plane when its surface is inclined at 45^0 to the V.P.	[14M]
7	Draw the isometric view of a cylinder of base diameter 50mm and axis 60mm. The axis of the cylinder is perpendicular to the (a) H.P. (b) V.P.	[14M]
8	The front view and top views of casting are shown in Fig. Draw its isometric views. All dimensions are in mm	[14M]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R18

Code No: R18A0021

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

Mathematics-I

(EEE, ME, ECE, CSE, IT & AE)

Roll No										

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

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

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1 (a) Define rank of a matrix , reduce the matrix A into Echelon form and hence find its rank **[7M]**

$$A=\begin{bmatrix} 2 & -4 & 3 & -1 & 0 \\ 1 & -2 & -1 & -4 & 2 \\ 0 & 1 & -1 & 3 & 1 \\ 4 & -7 & 4 & -4 & 5 \end{bmatrix}$$

(b) Show that the equations **[7M]**

$x+2y-z=3, 3x-y+2z=-1, 2x-2y+3z=2, x-y+z=-1$

are Consistent and hence obtain the solution

2 Verify Cayley Hamilton theorem of the matrix $A=\begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{bmatrix}$ **[14M]**

3 (a) If $u=\frac{yz}{x}, v=\frac{zx}{y}, w=\frac{xy}{z},$ show that $\frac{\partial(u,v,w)}{\partial(x,y,z)}=4.$ **[7M]**

(b) Find the maxima and minimum values of $x^3+y^3-3axy.$ **[7M]**

4 Expand the function $f(x,y)=e^x \log(1+y)$ in terms of x and y up to the terms of 3rd degree using Taylors theorem. **[14M]**

5 (a)Solve $x^2y\,dx-(x^3+y^3)\,dy=0.$ **[7M]**

(b) A bacterial culture, growing exponentially increases from 200 to 500 grms in the period from 6 am to 9 am. How many grams will be present at noon. **[7M]**

6 Solve $\left(D^2+a^2\right)y=\tan ax,$ by the method of variation of parameters. **[14M]**

7 (a) Solve $px^2+qy^2=z^2$ **[7M]**

(b) Solve $x(y-z)p+y(z-x)q=z(x-y)$ **[7M]**

8 (a) Find the Laplace transform of **[7M]**

$$e^{3t}-2e^{-2t}+\sin 2t+\cos 3t+\sinh 3t-2\cosh 4t+9$$

(b) Find the Laplace Transform of $\frac{\sin 3t\,\cos t}{t}$. **[7M]**

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Code No: R18A0501

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

Programming for Problem Solving

(EEE, ME, ECE, CSE, IT & AE)

Roll No										

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

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

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1	What are precedence of operators? Explain with example?	**[14M]**
2	Write a C program to print Pascal number triangle for a given number?	**[14M]**
3	Explain the significance of 'break' and 'continue' statement with a sample program?	**[14M]**
4	Explain static and extern storage classes with a sample program?	**[14M]**
5	What are the memory allocation functions? Explain them clearly?	**[14M]**
6	What is a function? Explain different types of calling functions with examples.	**[14M]**
7	Compare and contrast array of pointer and pointer to arrays with examples.	**[14M]**
8	How we can define structure with in a structure? Explain with a sample program.	**[14M]**

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