Code No.: **40301**

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **ENGINEERING DRAWING-I**

Branch: Common to **ALL**

Time: **3 hours**   Max. Marks: 75

Answer ALL questions of the following   **5x15Mark=75 Marks**

1. Draw the involute of a circle of diameter 50mm when a string is unwound in the clockwise direction. Draw a tangent and normal at a point located on the involute.

OR

2. a) Draw a Vernier Scale of R.F = 5 to read 1/5 cm and 1/25cm and to measure up to 5cm. Mark on the scale distance of 2.12cm.

   b) A Circle of 50mm diameter rolls over a horizontal straight line with out slipping. Draw the curve traced out by a point 'P' on the circumference of the circle for one revolution. Name the curve, draw a tangent and normal to the curve at a point 35mm from the line.   [6+9M]

3. A straight line AB 70mm long has one of its ends 25 mm behind VP and 20 mm below HP. The line is inclined at 30° to HP and 50° to VP. Draw its projections.

OR

4. Draw the projections of a line AB, 90mm long, its mid - point 'M' being 40mm above the H.P and 50mm infront of V.P. The end 'A' is 10mm above H.P and 20mm infront of V.P . Determine the true inclinations with the reference planes.

5. Draw the projections of a pentagonal plane, side 25mm resting on the HP on one of its edges. The plane of the pentagon is inclined at 45° to the HP and the perpendicular drawn from the midpoint of the resting edge makes an angle of 30° with the VP.

OR

6. A pentagon of side 30 mm rests on the ground on one of its comers with the sides containing the comer being equally inclined to the ground. The side opposite to the comer on which it rests is inclined at 30° to the VP and is parallel to the HP. The surface of the pentagon makes 50° with the ground. Draw the top and front views of the pentagon.

7. A hexagonal prism of side of base equal to 40 mm and axis height 110 mm rests on one of its corner of its base on H.P. such that the axis is inclined at an angle of 40° with H.P. and 60° with the V.P. Draw its projection.

OR

8. A Pentagonal Pyramid with side of base 25mm and axis 60mm long, has a triangular face on the H.P and the edge of the base contained by that face makes an angle of 30° with V.P Draw its Projections.

9. Draw an isometric projection of a frustum of a Hexagonal pyramid with top base edges = 30 mm and bottom face edges = 15 mm, axis perpendicular to H.P. Two of its base edges parallel to V.P. The height of frustum of the Hexagonal pyramid is 60 mm standing on H.P.

<div align="center">OR</div>

10. Draw i) Front View ii) Top View and iii) Right side View of the object shown in fig
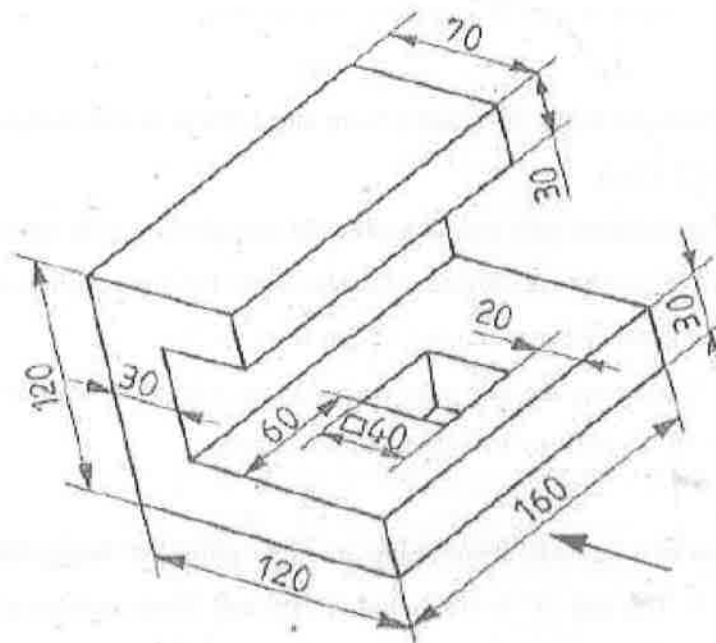
Code No.: 40P01

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: ENGINEERING PHYSICS-I

Branch: Common to ALL

Time: 3 hours   Max. Marks: 75

PART – A

I. Answer ALL questions of the following   5x1Mark=5 Marks

1. Define space lattice?
2. What is sharpness of resonance?
3. What is a wave function?
4. What is band gap of semiconductor?
5. Is Lenz's law a consequence of conservation of energy?

II. Answer ALL questions of the following   10x2Marks=20 Marks

1. Explain the terms relating crystal structure

    (i) Coordination number   (ii) Number of atoms per unit cell

2. Comment on Burger's vector in case of edge and screw dislocation?
3. Calculate the time period of a body if the maximum velocity of a body in SHM is 100 m/s and the maximum acceleration is 1.57 m/s^2.
4. Draw displacement and velocity graphs in SHM?
5. Differentiate between insulator, semiconductor and conductor on the basis of band theory of solids.
6. What is meant by effective mass of an electron?
7. Distinguish between p-type and n-type semiconductors.
8. Explain in detail the use of zener diode as voltage regulator.
9. State Ampere's circuital law.
10. Define curl of a vector. Write its determinant form.

PART-B

Answer ALL questions of the following   5x10 Marks= 50Marks

1. a) Define packing fraction of crystal structure. Calculate the packing fraction of FCC crystal.

    b) Explain the type of defects in metallic lattice (i) Vacancy (ii) Interstitial defects.

OR

2. a) Describe the seven crystal systems with neat diagrams?

    b) Obtain expression for inter planar distance in cubic system?

3. a) Define simple harmonic oscillation? Explain the physical characteristics of the simple harmonic oscillations.

    b) Explain what do you mean by over damped and critical damped oscillations.

<div align="center">OR</div>

4. a) Explain the function of all electrical oscillator containing capacitor, inductor and resistor qualitatively?

    b) Deduce simple harmonic motion wave equation and find its solution?

5. a) Explain the salient features of quantum free electron theory.

    b) What are the important conclusions of G.P. Thomson experiment?

<div align="center">OR</div>

6. a) Explain energy of a particle in a one dimensional infinite potential well? [6+4M]

    b) Calculate the De-Brogile wave length of α particle accelerated through a potential difference of 320 volts?

7. a) Derive an expression for the electron concentration in intrinsic semiconductors.

    b) Write about qualitative treatment of Fermi level in extrinsic semiconductors. [6+4M]

<div align="center">OR</div>

8. a) Explain the classification of semi conductors?

    b) Write brief note on Zener break-down and Avalanche break-down?

9. Explain the significance of gradient and scalar field vectors. Evaluate the divF, where
    $$F = 2x^3zi - xy^2zj + 3y^2xk.$$

<div align="center">OR</div>

10. a) State and explain Lenz's law? What are the applications of Lenz's law?

    b) What are integral and differential forms of Faraday law?

Code No.: **40M01**

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I B.TECH ISEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **MATHEMATICS-I**

Branch: **COMMON TO ALL**

Time: **3 hours**   Max. Marks: **75**

PART – A

I. Answer ALL questions of the following   **5x1Mark=5 Marks**

1. Does any unitary matrix have 1+j as its one Eigen value? Explain.
2. If the eigen values of a 3X3 square matrix are 2,2,8 then what is the rank of the matrix.
3. Define Rank of a Matrix.
4. Definethe Laplace transform of a function.
5. Show that matrix $\begin{bmatrix} cos\emptyset & -sin\emptyset \\ sin\emptyset & cos\emptyset \end{bmatrix}$.

II. Answer ALL questions of the following   **10x2Marks=20 Marks**

1. Write the wronskianW(f, g,h) of the functions f(x)=x, g(x)=Sin x, h(x)=Cos x.
2. Define Newton's law of coolong.
3. Define Linear Dependence and Independence of vectors.
4. Define Modal and Spectral Matrices.
5. Write general solution of $(D^2+D+1)y=0$.
6. Find the particular integral of $(D+2)(D-1)^2y=e^{-2x}$.
7. Define Hermitian and Unitary matrices.
8. Write any two applications of Linear Differential equations of first order.
9. Write the real symmetric matrix corresponding to the quadratic form $x^2+2y^2+3z^2+w^2-2xy+4xz-2xw+4yz-6yw-8zw$.
10. Find the orthogonal trajectories of $y^2=4ax$.

PART-B

Answer ALL questions of the following   **5x10 Marks= 50Marks**

1. Determine the values of K for which the following system of equations has non-trivial solutions and find them

    (k-1)x+(4k-2)y+(k+3)z=0;(k-1)x+(3k+1)y+2kz=0;2x+(3k+1)y+3(k-1)z=0.

    OR

2. a) By Gauss Elimination Method,solve the simultaneous equations

    X+2y+z=8;2x+3y+4z=20;4x+3y+2z=13.

    b) Find the rank of a matrix by reducing it to normal form $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$.

3. Verify Cayley-Hamilton theorem for the matrix and hence find A^{-1} and A^4 Where A=$\begin{bmatrix} i & 0 & 0 \\ 0 & 0 & i \\ 0 & i & 0 \end{bmatrix}$.

6. a) Write a program to merge two given files and store in a target file.
   b) How to handle errors in file management?

7. a) Discuss the programming applications of pointers.
   b) Write a program to multiply two matrices.

<div align="center">OR</div>

8. a) What is the need of nested structures? Explain with one example.
   b) Write a program for calculating the length of a string without using string handling functions.

9. a) Explain the functions: i) Malloc()   ii) Calloc()
   b) Draw the structure of Linux operating system and explain in detail

<div align="center">OR</div>

10. a) Write a shell script to read and display the average marks of 5 students.
    b) Explain in detail about open source software and technology with suitable examples.