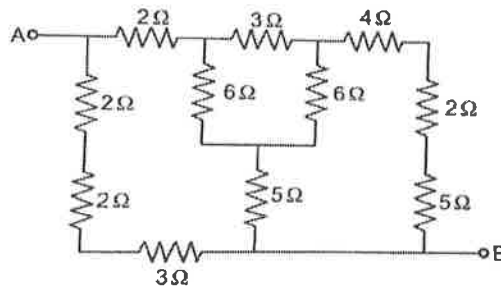


**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: **Basic Electrical & Electronics Engineering**Branch: **Common to CE, ME & MINING****Time: 3 hours****Max. Marks: 60****PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

1. Define potential difference and charge with its units.
2. A series RL circuit consists of resistance  $R = 10 \Omega$  and Inductive reactance  $X_L = 10 \Omega$ . Evaluate the Power Factor of the circuit.
3. Write the EMF equation of transformer. Describe the terms in it.
4. Define ripple factor in rectifiers and give its significance.
5. Convert the decimal number 258 into binary number system.

**PART-B**Answer any **FIVE** Questions of the following**5x10 Marks= 50Marks**

1. a) Prove  $R_S = R_L$ .  
b) Write short notes on  
i) Bilateral element ii) Active source iii) linear element iv) Inductance v) Capacitor.
2. a) Compare Faraday's law & Lenz's law.  
b) Obtain the equivalent resistance of the terminals between A and B.



3. a) The equation of an a.c is  $i = 24.24 \sin 628t$ . Determine its  
i) R.M.S. Value ii) Average value iii) form factor iv) peak factor  
b) Draw the Phasor diagram of R-L-C Series circuit.
4. Define and explain average value, RMS value, form factor and peak factor. Also derive the expression for form factor and peak factor for sinusoidal wave.
5. a) What are the losses in a transformer and how they vary with load? Deduce a condition for maximum efficiency.  
b) A 6 pole alternator runs at 1000 rpm, and supplies power to a 4 pole, 3 phase induction motor. The frequency of rotor of induction motor is 2 Hz. Determine the slip and speed of the motor.
6. a) In a single phase transformer. 25 KVA, 2000/200 V, the iron and full load copper losses are 350W and 400W respectively. Calculate the efficiency at unity power factor on (i) Full load  
b) Explain the principle of operation of 3-phase induction motor.
7. a) Write short notes on MOSFET  
b) Explain the operation of Full wave bridge rectifier.
8. a) Write short notes on Feedback amplifiers  
b) Explain different types of number systems with an example.



**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 II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Electrical Circuit Analysis and synthesisBranch: EEE

Time: 3 hours

Max. Marks: 60

**PART – A**

Answer ALL questions of the following

5x2Marks=10 Marks

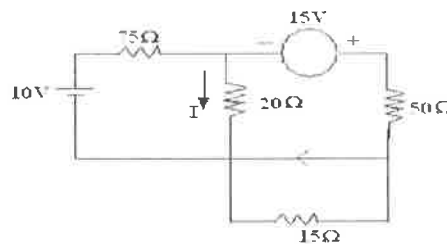
1. Write the condition for maximum power transfer in AC networks.
2. List out the phase and line quantity relations in both star and delta connections.
3. Write the expressions for Y parameters of a two port network.
4. What is meant by Time-constant? Write its significance.
5. Write the examples for positive real function.

**PART-B**

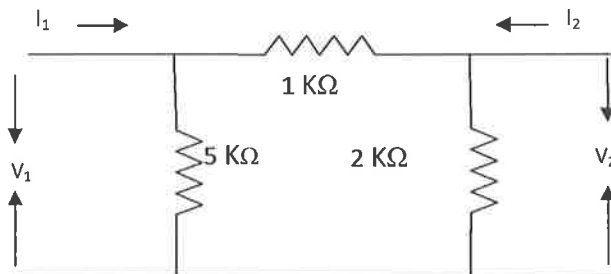
Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. Write the statement of superposition theorem. Also find the current through 20  $\Omega$  resistor by using superposition theorem.



2. a) State and prove the Millman's theorem  
b) State and explain compensation theorem
3. a) Discuss the advantages of three phase supply systems over single phase supply systems.  
b) Write short notes on Measurement of reactive power.
4. a) With the help of phasor diagram find the relations between line current and phase current in balanced delta connected load system  
b) A star connected load has impedance of  $(5+j8)$ ohms in each phase and is connected across a balanced 400V three phase delta connected supply. Obtain load currents in each phase.
5. a) Obtain the h-parameters in terms of Y- parameters.  
b) Obtain the h-parameters of a two-port network if its z-parameters are  $[Z] = \begin{bmatrix} 2 & 1 \\ 1 & 4 \end{bmatrix}$ .
6. a) Find the Y parameters of the given network



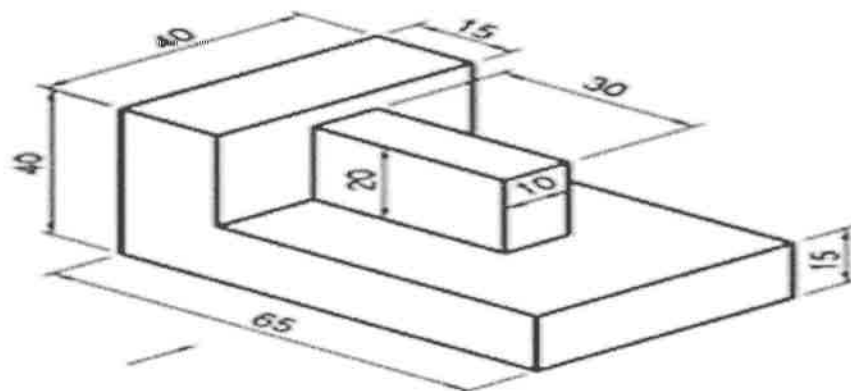
- b) Obtain Z parameters in terms of ABCD –parameters
7. Obtain the response of series RLC circuit when it is excited by a constant DC voltage of 'V' volts. Also draw the current responses in all cases.
8. Realize the following impedance functions in both the Cauer forms.

$$Z(s) = \frac{12s^4 + 10s^2 + 1}{3s^3 + 2s}$$



**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlachoampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Engineering GraphicsBranch: **Common to CSE, EEE & ECE****Time: 3 hours****Max. Marks: 60**Answer any **FIVE** Questions of the following**5x12 Marks= 60Marks**

1. a) Draw a diagonal scale of scale factor,  $1/48$  to read meters, decimeters and centimeters. Mark a distance of 4.57 m on it.  
b) Draw the involute of a circle of 40 diameter. Also, draw a tangent and a normal to the curve at a point 95 from the centre of the circle
2. a) Draw a vernier scale of R.F. =  $1/25$  to read centimeters upto 4 meters and on it, show lengths representing 2.39 m and 0.91m.  
b) Draw an involute of a pentagon of side 35 mm.
3. The line AB of 70 mm long, has its end A, 20 mm above H.P. and 15 mm in front of V.P. The line is inclined at  $30^\circ$  to H.P and  $60^\circ$  to V.P. Draw its projections.
4. The front view of a 125 long line PQ measures 80 and its top view measures 100. Its end Q and the midpoint M are in the first quadrant; M being 20 from both the planes. Draw the projections of the line PQ.
5. Draw the projections of a pentagonal prism of base 25 side and axis 50 long, when it is resting on one of its rectangular faces on H.P. The axis of the solid is inclined at  $45^\circ$  to V.P.
6. A composite plate of negligible thickness is made up of a rectangle  $60 \times 40$ mm and a semi circle on its longer side. Draw the projections when the longer side is parallel to H.P and inclined at  $45^\circ$  to V.P the surface of the plate making  $30^\circ$  angle with the H.P.
7. A square pyramid, with side of base 30 mm and axis 50 mm long is resting on its base on HP with an edge of the base parallel to VP. It is cut by a section plane, perpendicular to VP and inclined at  $45^\circ$  to HP. The section plane is passing through the mid -point of the axis. Draw the development of the surface of the cut
8. Draw the two views of the following isometric view.



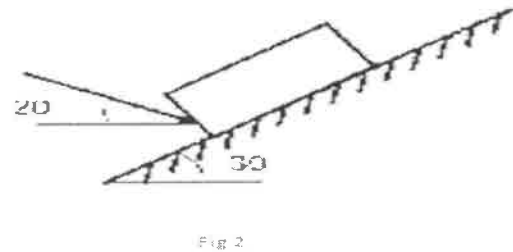
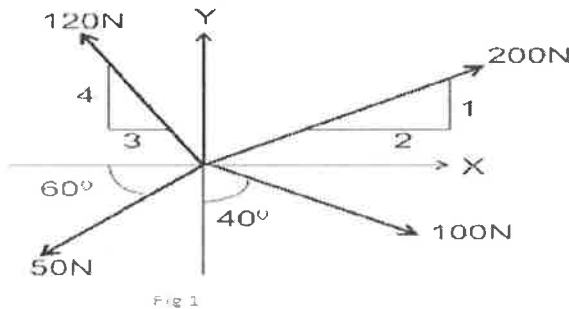


**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlupochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Engineering MechanicsBranch: **Common to CE, ME & MINING****Time: 3 hours****Max. Marks: 60****PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

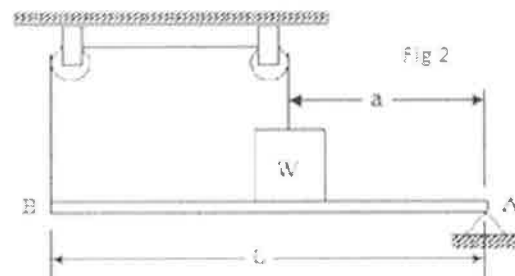
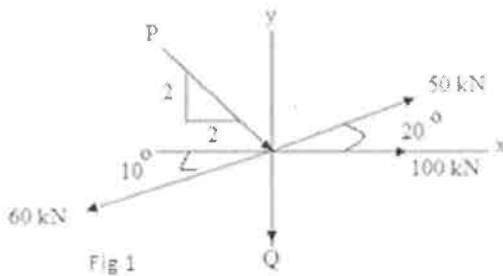
1. State and explain principle of transmissibility of a force.
2. State different types of supports and reactions.
3. Explain pappus theorem.
4. Distinguish between rectilinear motion and curvilinear motion.
5. How work energy equations are applied for connected bodies.

**PART-B**Answer any **FIVE** Questions of the following**5x10 Marks= 50Marks**

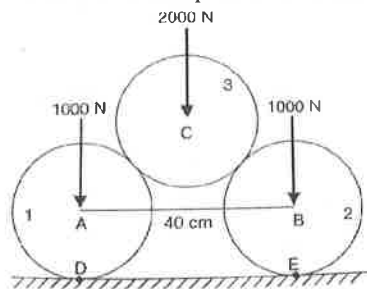
1. a) A system of four forces acting on a body is shown in fig 1. Determine the resultant.



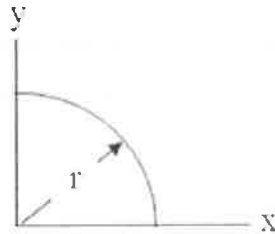
- b) The body on the 30° incline in fig 2 is acted upon by a force P inclined at 20° with the horizontal. If P is resolved into components parallel and perpendicular to the incline and the value of the parallel component is 300N, compute the value of the perpendicular component and of P.
2. a) State and prove Varignon's theorem.  
b) State and prove parallel axis theorem.
  3. a) Determine the forces P and Q, which along with other three forces are in equilibrium as shown in fig1 [4M]  
b) A weight W rests on a bar AB as shown in fig2. The cable connecting W & end B passes over frictionless pulleys. If bar AB has negligible weight find the reactions at hinge support A? [6M]



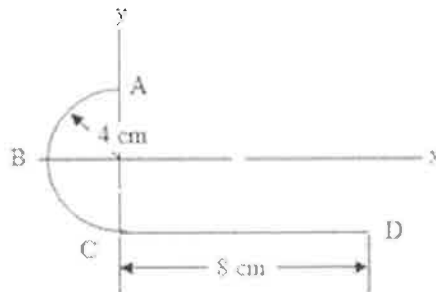
4. Two smooth circular cylinders, each of weight  $W = 1000 \text{ N}$  and radius  $15 \text{ cm}$ , are connected at their centres by a string  $AB$  of length  $= 40 \text{ cm}$  and rest upon a horizontal plane, supporting above them a third cylinder of weight  $= 2000 \text{ N}$  and radius  $15 \text{ cm}$  as shown in fig. . Find the force  $S$  in the string  $AB$  and the pressure produced on the floor at the points of contact  $D$  and  $E$ .



5. a) Determine the centroid of the quarter circle shown in fig., whose radius is  $r$ .



- b) Determine the mass moment of inertia of a Rectangular plate of size  $a \times b$  and thickness ' $t$ ' about its Centroidal axis
6. a) A slender homogeneous wire 'ABCD' of uniform cross section is bent into the form shown in fig. Determine the position of the centroid of the wire with respect to the given axes.



- b) Determine the centre of mass of a composite body formed by placing a brass cone with a base diameter  $10 \text{ cm}$  and  $15 \text{ cm}$  height over a steel cylinder of same diameter and a height of  $12 \text{ cm}$ . Density of steel is  $7850 \text{ Kg/m}^3$  and that of brass is  $8650 \text{ Kg/m}^3$ .
7. a) Two trains A and B leave a station along parallel lines. Train A starts with uniform acceleration of  $1/6 \text{ m/s}^2$  and attains a speed of  $24 \text{ kmph}$  remaining constant later. Train B leaves  $40 \text{ s}$  after train A with uniform acceleration of  $1/3 \text{ m/s}^2$  and attains a maximum speed of  $48 \text{ kmph}$ . When will B overtake A?
- b) The acceleration of a particle is given by  $a=10t-t^2$  where ' $a$ ' is in  $\text{m/s}^2$  and  $t$  is in seconds. If the particle starts from rest, determine its velocity when it has returned to its initial position.
8. a) Derive the work energy equation for general plane motion.
- b) State the principle of conservation of momentum. Give two examples where this principle is applied.



**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlachoampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Electronic Devices and Circuits

Branch: ECE

Time: 3 hours

Max. Marks: 60

**PART – A**

Answer ALL questions of the following

5x2Marks=10 Marks

1. Explain breakdown mechanism in a diode.
2. Why series inductor and L-section filters cannot be used with half-wave rectifiers?
3. A transistor has  $\alpha=0.98$ . If emitter current of the transistor is 1 mA, determine base current and gain factor ' $\beta$ '.
4. What are the advantages of MOSFET over JFET?
5. What is thermal runaway in transistor amplifier circuits?

**PART-B**

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) What is a PN junction? How is it formed?  
b) Explain the formation of depletion region in a PN junction.
2. a) Define  $C_D$  and derive its expression  
b) Draw and Explain V-I characteristics of diode in forward and reverse bias condition.
3. a) Write short notes on UJT  
b) Write short notes on Varactor diode
4. a) Compare Half Wave, Full wave and Bridge Rectifier. (6M)  
b) Write short notes on LCD. (4M)
5. a) What is early effect? Explain how it affects the BJT characteristics in common base configuration.  
b) Draw the circuit symbols of a Transistor and write the operation of Transistor.
6. a) Draw the circuit diagram of transistor CE configuration and describe the static input and output characteristics.  
b) Explain transistor as Current controlled device.
7. a) Define and explain the parameters transconductance, drain resistance and amplification factor of a JFET. Establish the relation between them.  
b) With the help of suitable diagrams explain the working of different types of MOSFETs.
8. a) Draw the circuit of self-biased CE-amplifier using diode compensation for  $I_{co}$ . Describe how bias compensation is achieved. (6M)  
b) Distinguish between d.c and a.c load lines with suitable examples. (4M)



**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlupochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Data StructuresBranch: CSE

Time: 3 hours

Max. Marks: 60

**PART – A**

Answer ALL questions of the following

5x2Marks=10 Marks

1. Write any four examples for linear data structure.
2. Write brief notes on Single linked list
3. Write the difference between pop & peek operation in stack.
4. Write any three differences between Tree and Graph.
5. Give any two examples for self-balancing binary search tree.

**PART-B**

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) Differentiate base case and general case in Recursive function.  
b) Differentiate primitive and non-primitive data structures.
2. a) Write a short note on Linear and Binary Recursion.  
b) Write a C program to Reverse a list using stack
3. a) Write a subroutine to concatenate two singly linked lists.  
b) Explain the creation of circular linked list.
4. a) Write an algorithm for creating a circular linked list.  
b) Write a C program that uses functions to create a singly linked list of integers.
5. a) Explain Round Robin algorithm with an example.  
b) Write a C program to illustrate stack operations.
6. Write a C program to implement output-restricted deque.
7. a) Define the following terminologies in tree data structure.  
i) leaf-node    ii) Height    iii) path  
b) Briefly explain the concept of Threaded binary trees.
8. a) Insert the following elements into an empty AVL Tree 20, 15, 5, 10, 12, 17, 25, 19  
b) Construct a B-tree of order 3 with the following elements  
10, 20, 15, 3, 2, 16, 21, 25, 30, 40



**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 II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Data Structures through CBranch: **Common to EEE & ECE****Time: 3 hours****Max. Marks: 60****PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

1. What is the time complexity of linear search?
2. Compare binary search and linear search.
3. Write any two differences between Single Linked List and Double Linked List.
4. Give an example of postfix, infix expression.
5. Write any two differences between Tree and Graph.

**PART-B**Answer any **FIVE** Questions of the following**5x10 Marks= 50Marks**

1. a) Write recursive algorithm for factorial of a given number  
b) Write a recursive C program for LCM (Least Common Multiplier)
2. a) Write an algorithm to find the sum of squares for the first N natural numbers.  
b) Write down the Applications of queue (any five)
3. a) Explain about insertion sort with an example  
b) List out file status functions
4. a) What are directives? Explain features of preprocessors.  
b) What is sorting? Explain different sorting techniques.
5. a) Write a C program for concatenation of two linked lists. (6M)  
b) List out the applications of linked lists. (4M)
6. a) Difference between arrays and linked lists.  
b) Explain Array and linked list representation of sparse matrix.
7. a) Write a C program to evaluate Postfix Expression.  
b) Define output restricted deque with suitable example.
8. a) Explain the procedure for constructing a binary tree using preorder and inorder traversal with suitable example.  
b) What is a graph? How is it different from Tree? Write a short note on linked list representation of the graph.



**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajiri (Dist), Hyderabad

**I B.TECH II SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019**Subject: Applied ChemistryBranch: **Common to ECE, EEE & CSE**Time: **3 hours**Max. Marks: **60****PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

1. What are the differences between hard water and soft water?
2. Does coating of zinc on iron protect from corrosion? Zinc act as anode or cathode?
3. Explain why Nylon possess high melting point and Teflon possess high toughness.
4. What is biodiesel? What are the advantages of biodiesel?
5. Write a note on the benefits of Green Chemistry.

**PART-B**Answer any **FIVE** Questions of the following**5x10 Marks= 50Marks**

1. a) What is meant by disinfection of water? Explain ozonization.  
b) Explain chlorination process in disinfection of water.
2. a) Explain Alkalinity of water.  
b) What are the causes and disadvantages of hardness of water? Mention the types of hardness.
3. a) Explain the copper electroplating?  
b) Explain the Galvanization process.
4. a) Write a short notes on Cementation  
b) What is Conductance? Explain specific and equivalent conductances. Give their units.
5. a) What are conducting polymers? Give examples. Explain conjugated conducting polymers.  
b) Write the preparation, properties & applications of Buna-S-rubber.
6. a) What is natural rubber? Explain vulcanization of rubber.  
b) Write the preparation, properties and uses of butyl rubber.
7. a) What is biomass energy? Write advantages, disadvantages and applications.  
b) Why are gaseous fuels more advantageous than solid fuels?
8. a) Discuss the applications of fibre reinforced composites.  
b) Write a short note on biosensors.





**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 II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**

Subject: Computational Mathematics

Branch: **Common to CE, ME,CSE& MINING**

**Time: 3 hours**

**Max. Marks: 60**

**PART – A**

Answer **ALL** questions of the following

**5x2Marks=10 Marks**

1. Define absolute and relative errors.
2. Write the Newton's forward difference formula to interpolate the polynomial.
3. Derive the normal equations to fitting a curve  $y = ae^{bx}$
4. Given  $y' = x + y, y(0) = 1$ , find  $y(0.1)$  by Taylor's method.
5. Classify the partial differential equation:  $u_{xx} + 8u_{yy} + 4u_{xy} + u_x + 2u_y = 0$ .

**PART-B**

Answer any **FIVE** Questions of the following

**5x10 Marks= 50Marks**

1. a) Find the positive root of  $x - \cos x = 0$  by using bisection method.  
b) Find the square root of 24 by Newton Raphson method.
2. a) Solve  $x^3 = 2x + 5$  for a positive root by iteration method  
b) Find a real root of  $x^3 - 4x - 9 = 0$ , using Bisection method.
3. From the following table estimate the number of students who obtained marks between 40 & 45 [ 10M]

Marks	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
Number of students	31	42	51	35	31

4. a) Prove that  $e^x = \left( \frac{\Delta^2}{E} \right) e^x \frac{Ee^x}{\Delta^2 e^x}$ , the interval of difference being  $h$ .

b) Given  $y_0 = -12, y_1 = 0, y_3 = 6$  &  $y_4 = 12$  find  $y_2$

5. Find  $a$  and  $b$  so that  $y = ab^x$  best fits the following data

x	0.2	0.3	0.4	0.5	0.6	0.7
y	3.16	2.38	1.75	1.34	1.00	0.74

6. a) Evaluate  $\int_0^5 \frac{dx}{4x+5}$  by Simpson's one-third rule (take  $n=10$ ).

- b) Find the first and second derivatives of the function  $y=f(x)$  tabulated below at  $x=0.6$

x	0.4	0.5	0.6	0.7	0.8
y	1.5836	1.7974	2.0442	2.3275	2.6511

7. By using the classical R-K fourth order method find the solution of the equation

$$\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}, y(0) = 1 \text{ for } x = 0.2, 0.4 \text{ and } 0.6$$

8. Solve the poisson's equation  $\nabla^2 f = 2x^2 y^2$  over the square domain  $0 \leq x \leq 3$  and  $0 \leq y \leq 3$  with  $f = 0$  on the boundary and  $h = 1$ .



**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlupochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Applied Physics - IIBranch: **Common to CE, EEE, ME, ECE, CSE & MINING****Time: 3 hours****Max. Marks: 60****PART - A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

1. What is magnetic levitation effect in superconductors?
2. What is the physical significance of wave function  $\Psi$ ?
3. What are the differences between Intrinsic and Extrinsic semiconductors?
4. What is quantum dot?
5. State the Gauss's law of electrostatics.

**PART-B**Answer any **FIVE** Questions of the following**5x10 Marks= 50Marks**

1. a) What is diamagnetism? Explain its properties with temperature.  
b) Explain hysteresis loop observed in ferromagnetic materials.
2. a) Distinguish between dia, para and ferromagnetic materials. Mention their properties. **(6M)**  
b) Discuss the different types of superconductors and mention their general properties. **(4M)**
3. a) State Heisenberg uncertainty principle. Show that electrons cannot exist within the nucleus on the basis of the above principle.  
b) Describe the experimental verification of matter waves using Davisson Germer's experiment.
4. a) Explain about basic postulates of Quantum Mechanics. **(7M)**  
b) A hydrogen atom is  $5.3 \times 10^{-11}$  m in radius. Use the uncertainty principle to estimate the minimum energy an electron can have in this atom. **(3M)**
5. a) Explain about Intrinsic semiconductors with an example.  
b) Explain about n-type and p-type semiconductors with neat diagram.
6. a) Discuss the salient features of Kronig Penny model of a crystal.  
b) The  $R_H$  of a specimen is  $3.66 \times 10^{-4}$  m<sup>3</sup>/c its resistivity is  $8.93 \times 10^{-3}$   $\Omega$ m. Find the mobility and carrier concentration.
7. a) What are Nano Materials? Explain about one- dimensional, two- dimensional and three- Dimensional nano materials with examples  
b) What is synthesis of Nanomaterial? Explain about any one synthetic method for nano materials.
8. a) Explain about divergence and curl of a vector field with an example. **(4M)**  
b) What is displacement current? How does it differs from conduction current? **(4M)**  
c) Write four Maxwell's equation and outline their physical meaning. **(2M)**

