Code No.: **50301** | **MR15**

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-2018

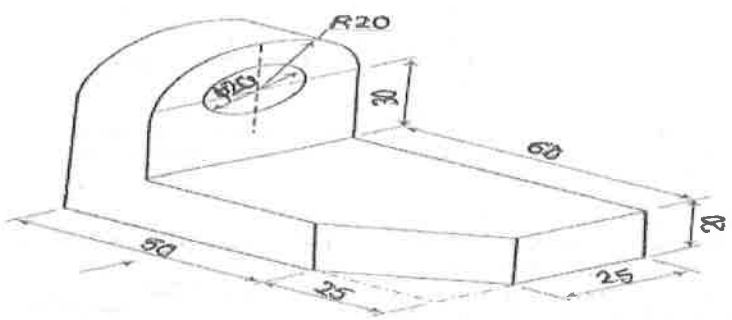
Subject: **Engineering Graphics**

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

Time: 3 hours **Max. Marks: 60**

Answer any FIVE Questions of the following **5x12 Marks= 60Marks**

1. A rolling circle of diameter 50 mm, rolls without slipping on a horizontal ground. Trace only that part of locus traced by a point on the circumference of the rolling circle as it descends from the highest level until it touches the ground. Draw the tangent and normal at any point on the curve.
2. a) Construct a scale of 1/60 to read meters and decimeters and long enough to measure up to 6m. Mark on it a distance of 5.4m
   b) Construct a direct Vernier scale to read distances, correct to a decameter on a map, in which the actual distances are reduced in the ratio 1: 40,000. The scale should be long enough to measure 6 KM. Mark the lengths 3.34 KM and 0.59 KM on the scale.
3. A 100 mm long line is parallel to and 40 mm above H.P. Its two ends are 25 mm and 50 mm infront of V.P respectively. Draw its projections and find its inclination with V.P.
4. A square prism, base 40 mm side and height 65 mm, has its axis inclined at 45° to the HP and has an edge of its base on HP Draw its projections.
5. A cone of diameter of base 50mm and axis 60mm long, is resting on its base on HP. Draw the projections, development of the cone and show on it, the shortest path traced by a point, starting from a point on the circumference of the base of the cone, moving around it and reaching the same point.
6. A cone of base 50mm diameter and 60mm long, is resting on its base on H.P. Section plane perpendicular V.P, cuts the cone at a distance of 10 from the axis. Draw the development of the cut solid.
7. Draw the front view, top view and side view of the object whose isometric view is shown in the Figure. (All dimensions are in mm).



8. a) A line AB of 100 length, is inclined at an angle of 30° to HP and 45° to VP. The point A is 15 above H.P, 20 in front of V.P and 120 from right profile plane. Draw i) front view ii) top view and iii) left side view of the line AB.
   b) Write few Editing and dimensioning commands in AUTO CAD and Explain about them.

Code No.: **50B02** | **MR15**

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-2018

Subject: **Applied Physics - I**

Branch: **CE, MINING, ME, CSE, EEE & ECE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. Explain spatial and temporal coherence.
2. Write two differences between spontaneous and stimulated emission
3. Give any four factors affecting the architectural acoustics.
4. Distinguish between free and forced vibrations.
5. What are bosons and give two examples of Bose-Einstein statistics

PART-B

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

1.Derive the expression for fringe width in an interference pattern.

2.a) Describe Young's double slit experiment. Derive an expression for the intensity at a point in the region of superposition of two coherent waves of the same period and wavelength.

b) The diameter of 16^{th} and 9^{th} dark rings in Newton's rings experiment are 0.37cm and 0.28cm respectively. Calculate the radius of curvature of the given plano convex lens, if the wavelength of the light used is 6000 A°.

3. a)What is the structure of optical fiber? Give the advantage of optical fiber over metallic cables.
   b) Define Numerical aperture of the fiber. Why it can't be made very large?
4. a) Distinguish between ordinary and laser light. **[2+5+3]**
   b) Describe the construction and working of He-Ne laser.
   c) Give necessary energy level diagram
5. a) Kundt's tube method
   b) Properties of ultrasonic waves
6. Deduce the differential equation and its solution for Damped vibrations.
7. Apply Bose-Einstein statistics to the photon gas and derive Planck's formula.
8. a) Give a comparison of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statics
   b) Describe the properties of Maxwell-Boltzmann statistics.

Code No.: **50B01** | **MR15**

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-2018

Subject: **Engineering Mathematics**

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

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. Find the rank of the matrix $A=\begin{bmatrix}2 & 3 & 7\\ 3 & -2 & 4\\ 1 & -3 & -1\end{bmatrix}$ by reducing it to the normal form
2. Prove that the Eigen values of A^{-1} are the reciprocals of the Eigen values of A
3. Solve $(x^2-y^2)dx=2xydy.$
4. Find the solution of $x^2y''+xy'=x^2$
5. Find $L\{cos^3 2t\}$

PART-B

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

1. (a) Solve the system of equations x+y+2z=4, 2x-y+3z=9, 3x-y-z=2.
   (b) Reduce the following matrix into its normal form and hence find its rank.
   $$A=\begin{bmatrix}8 & 1 & 3 & 6\\ 0 & 3 & 2 & 2\\ -8 & -1 & -3 & 4\end{bmatrix}$$
2. (a) Find the value of k so that the rank of the matrix $\begin{bmatrix}0 & 1 & -3 & -1\\ 1 & 0 & 1 & 1\\ 3 & 1 & 0 & 2\\ 1 & 1 & k & 0\end{bmatrix}$ is 2.
   (b) If A and B are symmetric matrices, then prove that AB is symmetric if and only if $AB=BA$
3. Find the characteristic equation of the matrix, $A=\begin{pmatrix}2 & 1 & 1\\ 0 & 1 & 0\\ 1 & 1 & 2\end{pmatrix}$ and hence compute A^{-1}. Also find the matrix represented by $A^8-5A^7+7A^6-3A^5+A^4-5A^3+8A^2-2A+I.$
4. (a) Prove that a square matrix A and its transpose A^T have the same Eigen values.
   (b) Find the eigen values and eigen vectors of the matrix $\begin{pmatrix}5 & 4\\ 1 & 2\end{pmatrix}$
5. Using Laplace transform technique,solve $\frac{d^2y}{dt^2}+2\frac{dy}{dt}-3y=\sin t, y=\frac{dy}{dt}=0$
6. Using the method of variation of parameters, solve $\frac{d^2y}{dx^2}+4y=tan\,2x.$
7. a. Find the orthogonal trajectories of the family of circles $x^2+y^2+2gx+c=0$, where g is the parameter.
   b. Solve the differential equation: $\frac{d^2y}{dx^2}+\frac{1}{x}\frac{dy}{dx}.=\frac{12\log x}{x^2}$
8. a. Find $L\{te^{3t}\ Sin\ 2t\}$. b. Find $L\left\{\frac{\cos 4t\ sin2t}{t}\right\}$

Code No.: **50B03**

MR15

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-2018

Subject: **Applied Chemistry**

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

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. What are the specifications of drinking water?
2. Impure metal corrodes faster than pure metal under identical conditions. Give reason.
3. Write the synthetic chemical equation of PVC?
4. 'Sulphur enhances the calorific value but it is undesirable to the coal'. Give reason.
5. What is the concept of R4M4 for Green Chemistry?

PART-B

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

1. a) Explain the chlorination and ozonisation methods of disinfection of water.
   b) Give an account on desalination of water by Reverse osmosis.
2. a) Explain the following treatment of boiler feed water with respect to
   i) Internal treatment ii) External treatment
   b) What are boiler troubles? Write an account on priming and foaming.
3. a) Explain charging and discharging of lead acid storage cell with chemical reactions.
   b) What is cathodic protection? Explain with suitable examples.
4. a) Write Nernst equation and give its applications
   b) Describe the factors effecting rate of corrosion by nature of metal and nature of environment
5. a) Write preparation, properties and engineering applications of Nylon 6,6.
   b) Describe the synthesis and applications of poly lactic acid and poly vinyl acetate Bio degradable polymers
6. Explain briefly the determination of calorific value by Junkers gas calorimeter with a neat labeled diagram
7. a) What are the characteristics of composites? Give the applications of plastic reinforced Composites.
   b) What are fullerenes and carbon nano tubes? Give their applications.
8. a) Give a brief account of Principles of Green Chemistry
   b) Explain the role of ultrasonic and microwave assisted reactions in green synthesis.

Code No.: **50501** | **MR15**

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-2018

Subject: **Computer Programming**

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

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. What is the use of ternary operator?
2. Why do array subscript start at 0 instead of 1?
3. What is Recursion in C Language?
4. What is nested structure; Write the syntax for nested structure?
5. What are the different modes of file operations?

PART-B

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

1. a) Write a C program that illustrates the application of logical Operators in C language?
   b) Draw the flow chart for finding greatest of 3 numbers?

2. a) Write a program to print multiplication table for a given number using do-while loop
   b) Write a program to print the sum of two dimensional Array elements

3. a) Write a program to perform all arithmetic operations using Switch-Case statement?
   b) Write a C program that prints the highest and lowest element in one-dimensional array?

4. a) List out the differences between entry controlled and exit controlled loops?
   b) Explain Conditional Compilation with examples?

5. a) Explain following string handling functions
      i) strlen() ii) strcat()
   b) Write a program to demonstrate Call-by-reference

6. a) Write a C program that checks whether an entered String is a Palindrome or not?
   b) Explain in detail Storage Classes with examples?

7. a) How to perform Structure manipulations using functions, explain?
   b) Explain following dynamic memory allocation functions
      i) malloc() ii) calloc()

8. a) Explain the use of following pre-processor directives
      i) Include ii)define
   b) Explain linear search with example
   c) Write a program to perform addition of two numbers using Functions with arguments and no return values?

Code No.: **50580**

MR15

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-2018

Subject: **Computer Programming And Numerical Methods**

Branch: **ECE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. List the symbols used in flowchart?
2. Distinguish between system software and application software.
3. Why is a function prototype required?
4. Differentiate Structure and Union?
5. Write the demerits of Newton-Raphson method

PART-B

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

1. a) What is Type-casting, explain with suitable examples?
   b) Explain different data types in C Language?
2. a) Conditional Operator
   b) Write an algorithm to find the roots of quadratic equations?
3. a) List out the differences between entry controlled and exit controlled loops?
   b) Explain Conditional Compilation with examples?
4. a) Write a C program that compares two strings?
   b) Arrays of strings
5. a) With suitable example, explain nested structures?
   b) How Arrays are closely related to Pointers, explain?
6. a) Explain how Dynamic Memory is implemented in C language with examples?
   b) Write a C program to perform multiplication of matrices using pointers?
7. Evaluate $\int_0^1 \frac{1}{1+x^2}\,dx$ using Trapezoidal rule, Find the exact solution also.
8. Using Runge-Kutta method find y (0.2) for the equation $\frac{dy}{dx} = \frac{y-x}{y+x}$, y(0) = 1, take h = 0.2.

Code No.: **50201**

MR15

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-2018

Subject: **Electrical Circuits**

Branch: ECE

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

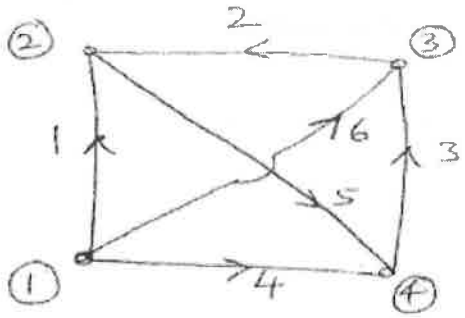
1. Three Resistances of 30Ω,40Ω,60Ω are connected in star find equivalent delta connected resistances?
2. Define (i) Sub Graph (ii) Loop
3. What is mutual inductance?
4. Explain the impedance triangle.
5. Write the relation between bandwidth, Q factor and resonant frequency?

PART-B

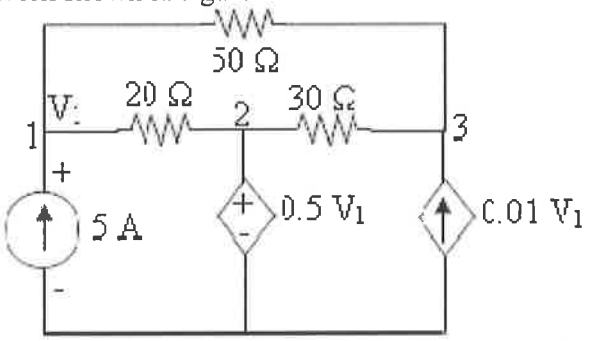
Answer any FIVE Questions of the following **5x10 Marks= 50Marks**

1. a) A battery consists of five cells, each having an emf of 1.2V and internal resistance of 0.4Ω joined in series. If battery is connected to 6Ω load then find the load current.
   b) State and explain Kirchhoff's Laws.

2. Obtain the basic Tie set matrix for the graph shown in figure, taking the tree consisting of branches 2, 4, 5. Write down the voltage and current expressions.



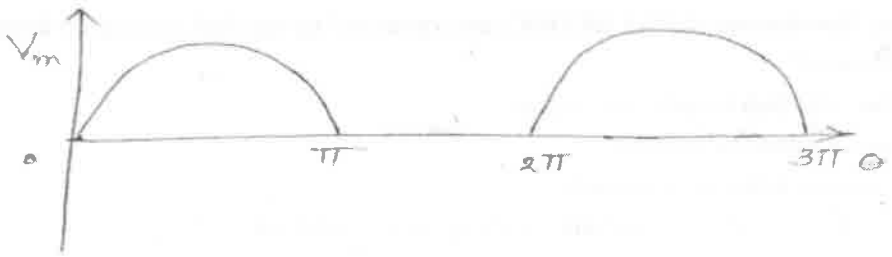
3. Use the nodal analysis to determine voltage at node 1 and the power supplied by the dependent current source in the network shown in figure



4. a) Distinguish between self and Mutual Inductance. Also Explain the significance of co-efficient of coupling.

   b) Two coupled coils of L1=0.8H and L2=0.2H have a coupling co-efficient K=0.9,Find the Mutual Inductance M?

5. Explain the concept of formation of cut set and tie set matrices by a suitable example
6. a) Calculate V_{avg} and V_{rms} for the following figure



   b) The admittance of a circuit is (0.05-j0.08) mhos. Find the values of resistance and inductive reactance of the circuit if they are connected in series

7. a) Explain the concept of parallel Resonance.

   b) A series RLC circuit consist of a resistor of 1KΩ and an inductance of 100mH in series with the capacitance of 10pF. If 100V is applied across the combination,Determine

   i) The Resonant frequency ii) Maximum current in the circuit (iii) Q-Factor of the circuit

8. Show that the locus of the current in an R-L circuit with XL variable is a semicircle. Find the radius and the center of the circle?

Code No.: **50202**

MR15

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-2018

Subject: **Basic Electrical and Electronics Engineering**

Branch: **CSE**

Time: 3 hours **Max. Marks: 60**

PART – A

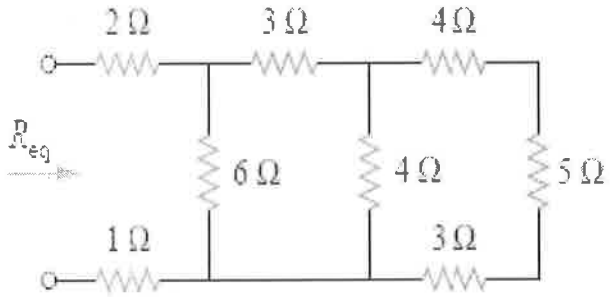
Answer ALL questions of the following **5x2Mark=10 Marks**

1. Define self-inductance and mutual inductance.
2. Define form factor and peak factor.
3. What is slip frequency?
4. Draw the V-I characteristics of PN junction diode.
5. Write the truth table for NOR and NAND gates.

PART-B

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

1. a) Find the resistance 'R_{eq}' of the following circuit?



b) State and Explain faraday's laws of electromagnetic induction?

2. a) Explain passive and active elements.

b) Derive the relation between mutual inductance, self inductance and coefficient of coupling.

3. Derive an expression for average value of a sine wave. Define form factor & real power
4. Find the impedance and current of series RL circuit with R = 2Ω and L = 3mH excited by a voltage source $v(t) = 100 \sin(100\pi t + 30°)$. Also draw its phasor diagram.
5. a) Explain speed torque characteristics of an induction motor?

b)What is voltage regulation in an alternator?

6. a) Transistor acts as an amplifier. Explain.

b) Draw the input characteristics of CB configuration transistor.

7. a) Explain De Morgan's Theorems with suitable examples.b) Explain about SR flip-flop
8. a) Explain about D flip flop b) Explain different number system conversions with examples.