Code No.: **50B01** MR 15

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 Sem Supplementary Examinations, DECMBER-2017

SUBJECT: **ENGINEERING MATHEMATICS**

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

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

PART – A

Answer All Questions **5x2Mark=10 Marks**

1. Determine the rank of the matrix $A=\begin{bmatrix}0 & 1 & -3 & -1\\ 1 & 0 & 1 & 1\\ 3 & 1 & 0 & 2\\ 1 & 1 & -2 & 0\end{bmatrix}$
2. Prove that the Eigen values of A^{-1} are the reciprocals of the Eigen values of A
3. Solve the differential equation $(x^2 - ay)dx = (ax - y^2)dy$
4. The particular integral of $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^x$
5. Evaluate $L^{-1}\left(\frac{1}{s^2(s^2+a^2)}\right)$

PART-B

Answer Any 5 Questions **5x10 Marks= 50 Marks**

1. Apply factorization method to solve the Equations. **(10M)**

   3x+2y+7z=4
   2x+3y+z=5
   3x+4y+z=7

2. 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 $\begin{pmatrix}5 & 4\\ 1 & 2\end{pmatrix}$

3. Solve $\frac{dy}{dx}(x^2y^3 + xy) = 1$
4. Using the method of variation of parameters, solve $\frac{d^2y}{dx^2} + 4y = tan2x.$
5. Find $L^{-1}\left\{\log\left(\frac{s+1}{s-1}\right)\right\}$
6. a) Discuss for what values of λ, μ the simultaneous equations x+y+z=6, x+2y+3z=10, x+2y+λz= μ have

   (i) no solution (ii) a unique solution (iii) an infinite number of solutions.

   b) Find the inverse of the matrix $\begin{bmatrix}2 & -1 & 3\\ 1 & 1 & 1\\ 1 & -1 & 1\end{bmatrix}$ by using elementary transforms.

7. Find the eigen values and eigen vectors of the matrix A = $\begin{bmatrix}6 & -2 & 2\\ -2 & 3 & -1\\ 2 & -1 & 3\end{bmatrix}$.
8. A copper ball is heated to a temperature of 80^0c. Then at time t=0 it is placed in water which is maintained at 30^0c. If at t=3 minutes, the temperature of the ball is reduced to 50^0c find the time at which the temperature of the ball is 40^0c.

Code No.: **50B02** MR 15

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

I B.Tech I Sem Supplementary Examinations, DECEMBER-2017

SUBJECT: **Applied Physics-I**

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

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

PART – A

Answer All Questions **5x2Mark=10 Marks**

1. State the conditions for interference of light
2. Write few differences between Three and Four level pumping schemes?
3. What is piezo electric effect and inverse piezo electric effect?
4. Write the differences between damped and forced vibrations?
5. What are bosons and give two examples of Bose-Einstein statistics

PART-B

Answer Any 5 Questions **5x10 Marks= 50 Marks**

1. Derive the expression for fringe width in an interference pattern.
2. a) Distinguish between ordinary and laser light.
   b) Describe the construction and working of He-Ne laser.
   c) Give necessary energy level diagram **[2+5+3]**
3. Explain in detail factors affecting the architectural acoustics and their remedies.
4. a) Give analogy between mechanical and electrical oscillator
   a) Derive the solution of the differential equation governing the simple harmonic oscillations of an oscillator of mass (m).
   c) Write a short note on resonance **[2+6+2]**
5. Apply Bose-Einstein statistics to the photon gas and derive Planck's formula.
6. 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°.
7. a) Explain the types of optical fibers.
   b) Discuss the following in brief i) Spontaneous emission ii) Stimulated emission iii) Pumping iv) Population inversion v) metastable state.
8. a) Qualitatively discuss Sabine's formula for reverberation time.
   b) Give few differences between magnetostriction oscillator and piezo electric oscillator method.
   c) Write two applications of ultrasonics **[6+2+2]**

Code No.: **50501**

MR 15

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

I B.Tech I Semester Supplementary Examinations, DECEMBER-2017

SUBJECT: **Computer Programming**

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

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

PART – A

Answer All Questions **5x2Mark=10 Marks**

1. List the types of operators in C?
2. Why do array subscript start at 0 instead of 1?
3. What is need for implementing recursion?
4. How does one pointer points to another pointer?
5. What is EOF? When is EOF used?

PART-B

Answer any five of the following questions **5x10 Marks= 50 Marks**

1. a) i) Write the rules for constructing Algorithm
   ii) What is an Identifier and list the rules for constructing an Identifier
   b) Write short notes on Type Conversions with examples?
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) What are the advantages of user defined functions in C Language?
   b) Write a program to check the given number is prime or not using functions with arguments and no return values
4. a) Explain about self-referential Structures with suitable example?
   b) Write a program to create a block of memory of given size at run time using calloc()?
5. a) Explain File status functions with suitable examples?
   b) Explain Insertion sort with suitable example?
6. a) List out the differences between entry controlled and exit controlled loops?
   b) Explain Conditional Compilation with examples?
7. a) Write a program that prints the next character for the corresponding there characters given to the program?
   b) Write a C program that computes GCD of two numbers using recursion?
8. a) Explain how Dynamic Memory is implemented in C language with examples?
   b) Write a C program to perform multiplication of matrices using pointers?

Code No.: **50580** MR 15

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

I B.Tech I Semester Supplementary Examinations, DECEMBER-2017

SUBJECT: **Computer Programming And Numerical Methods**

Branch: **Common to EEE & ECE**

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

PART – A

Answer All Questions **5x2Mark=10 Marks**

1. Classify the types of software?
2. Why do array subscript start at 0 instead of 1?
3. Why is a function prototype required?
4. What is nested structure; Write the syntax for nested structure?
5. Write the demerits of Newton-Raphson method

PART-B

Answer any five of the following questions **5x10 Marks= 50 Marks**

1. a) What is Type-casting, explain with suitable examples?
   b) Explain different data types in C Language?
2. a) Write the syntax for all Looping control structures in C?
   b) Write a program to perform multiplication of given two matrices?
3. a) What is the advantage of using register storage class? What are the restrictions with register storage class?
   b) Write a C program that prints the Fibonacci Series using recursion?
4. a) How to perform Structure manipulations using functions, explain?
   b) Explain following dynamic memory allocation functions
      i) malloc() ii) calloc()
5. 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.
6. a) Differentiate While and Do-while and draw the flow charts for them.
   b) Explain Bit-wise operators in C Language.
7. a) Write a C program that compares two strings.
   b) Explain Arrays of strings.
8. a) With suitable example, explain nested structures?
   b) How Arrays are closely related to Pointers, explain?

Code No.: **50B03**

MR 15

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

I B.Tech I Semester Supplementary Examinations, DECEMBER-2017

SUBJECT: **Applied Chemistry**

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

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

PART – A

Answer All Questions **5x2Mark=10 Marks**

1. Differentiate scales and sludge?
2. Impure metal corrodes faster than pure metal under identical conditions. Give reason.
3. What are the repeat units of (i) natural rubber and (ii) bakelite?
4. Define HCV and LCV?
5. What is the concept of R4M4 for Green Chemistry?

PART-B

Answer any five of the following questions **5x10 Marks= 50 Marks**

1. a) Describe the complexometric method to determine the hardness of water.
   b) What is phosphate and carbonate conditioning? Give the chemical reactions involved.
2. a) Explain charging and discharging of lead acid storage cell with chemical reactions.
   b) What is cathodic protection? Explain with suitable examples.
3. a) Explain preparation, properties and engineering applications of SBR rubber.
   b) Describe the synthesis and applications of poly lactic acid and poly vinyl acetate Bio degradable polymers
4. a) Give an account on ultimate analysis of coal and write significance of each constituent.
   b) What are renewable energy sources? Give the applications of hydro power and biomass energy.
5. a) Write short notes on Applications of Nano materials
   b) Write short notes on Bio fuels
6. a) What is lime soda process? Give principle and chemical reaction involved in the process.
   b) Write short notes on Classification of Nano materials
7. a) Write Nernst equation and give its applications
   b) Describe the factors effecting rate of corrosion by nature of metal and nature of environment
8. a) Explain compression moulding with a neat diagram.
   b) What are conducting polymers? Write its classification and applications.

Code No.: **50H01** | MR 15

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I B.Tech I Semester Supplementary Examinations, DECEMBER-2017

SUBJECT: **English**
Branch: **Common to CSE & ECE**

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

PART – A

Answer All Questions **5x2Mark=10 Marks**

1. **a. Fill in the following blank with suitable verb form given in the bracket.**
   Ravi _____ (live) in Mumbai since 2013.
   b. Fill in the following blank with suitable verb form given in the bracket.
   Varun _____(write) a complaint.
2. **a. Write the homophone of the following word.**
   Right
   b. Convert the following sentence into direct speech.
   Let the door be closed.
3. **a. Supply a question tag to the following.**
   She hasn't passed the exam. _____ ?
   b. Use the following phrasal verb in your own sentence.
   Call off
4. **a. Transform the following into a passive voice sentence.**
   Hari wrote the letter.
   b. Select the correct one word substitute.
   The study of space and the objects in it is called astrology/astronomy.
5. **Join the given two sentences using the conjunctions provided.**
   a. He is fluent in Telugu. He is fluent in English.(both… and)
   b. She cannot read. She cannot write. (neither … nor)

PART-B

Answer any five of the following questions **5x10 Marks= 50 Marks**

1. **a.** Attempt an analysis of the characters in the story *Around the World in Eighty Days* from their social and financial backgrounds.
   b. What are Ambedkar's reflections on the tasks that lie ahead of us?
2. "Kalam was an institution-builder, team-builder, visionary, dreamer and motivator of men." (Dr V. K. Saraswat, former DRDO Director-general) Explain in your own words.
3. **a.** How according to the author the "new digital divide" could occur?
   b. Summarize the lesson, "Death of a Hero."
4. **a.** Write a letter to your friend on the recent NSS camp held where you played an active role in enlightening the slum dwellers on *Swaccha Hyderabad.*
   b. Write a letter to the editor of a newspaper about the stray dog menace in your colony

5. **a. Summarize the following passage.**

One of the problems with using the Internet for information is that this medium is unregulated. The information may be biased, or just plain wrong, because no authority monitors the content of the sites. How do you determine what information is accurate and credible? Ultimately, you will have to make that decision. Ask yourself whether someone would have a reason to present biased information. If at all possible, verify the information through other sources, such as newspaper or magazine articles. If the source is a scholarly article, check for a list of references, and if a list of references is provided, try to determine whether the list is credible by verifying some of the sources. Finally, credible sources often provide the credentials of the individual(s) who wrote the article. If no source is provided, be cautious. Moreover, Web sources should be evaluated like any other source.

b. The media covers disasters extensively. Do you think that is helpful? Justify your Answer.

6. Why does Ambedkar's 'Grammar of Anarchy' speech resonates even in today's India?
7. **Write an essay in approximately 300 words on:**

"Students should complete community service hours as a requirement to graduation."

8. **a.** How according to the author can we "consciously regulate the technological advancement" for a secure future.

b. Summarize the story, "The Doctor's word."

Code No.: **50301** MR 15

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

I B.Tech I Semester Supplementary Examinations, DECEMBER-2017

SUBJECT: **Engineering Graphics**
Branch: **Common to CE, ME, & Mining**

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

Answer any 5 questions **5×12=60M**

1. a) Construct a vernier scale to show a yards, The R.F being 1/3300. Show the distance representing 2 furlongs 99 yards.
   b) To construct an ellipse when the distance of the focus from the directrix is equal to 50mm and eccentricity is2/3.

2. a) The actual length of 500m is represented by a line of 15 cm on a drawing. Construct a vernier scale to read upto 600 m. Mark on the scale a length of 549 m.
   b) Draw a hypocycloid of a circle of diameter 50mm which rolls inside a circle of diameter 180mm for one revolution. Also, draw a tangent and normal to the hypocycloid at a point 50mm from the centre of the directing circle.

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) A line PQ, 70 mm long is parallel to H.P and inclined at 30° to V.P. The end P is 25 mm above H.P and 40 mm infront of V.P. Draw the projections of the straight line.
   b) Draw the projections of following points on the same ground line, keeping projections 15 mm apart.
      (i) E in H.P & 20 mm behind V.P
      (ii) F in both V.P and H.P
      (iii) G in V.P & 40 mm above H.P

5. A tetrahedron of 30mm side is resting with one of its edges on H.P. The edge on which it rests is inclined at 45^0 to V.P and a face containing that edge is inclined at 30^0 to the H.P. Draw the projections of the solid.

6. A pentagonal pyramid, with side of base 25mm and 50mm long axis has a triangular face on V.P and the edge of the base contained by that face is inclined at 30^0 to H.P. Draw the projections.
7. a) Draw the isometric projection of a hexagonal pyramid with its axis vertical with base side 30 mm and height 65mm.
   b) Draw the isometric projection of a hexagonal pyramid of base side 30mm and height 75mm. when it is resting on H.P such that an edge of the base is parallel to V.P.

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.: **50202**

MR 15

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

I B.Tech I Semester Supplementary Examinations, DECEMBER-2017

SUBJECT: **Basic Electrical & Electronics Engineering**

Branch: **CSE**

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

PART – A

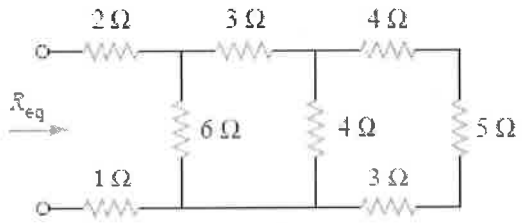
Answer All Questions **5x2Mark=10 Marks**

1. Define Faraday's and Lenz's laws.
2. Define form factor and peak factor.
3. What is slip ring?
4. Draw the V-I characteristics of PN junction diode.
5. Define voltage gain and current gain in amplifier.

PART-B

Answer any five of the following questions **5x10 Marks= 50 Marks**

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



   b) State and Explain faraday's laws of electromagnetic induction?
2. a) Draw the phasor diagram of series RC circuit.
   b) What is difference between impedance and admittance?
3. a) A 6600/400 V, 50 Hz, single phase core type transformer has a net cross-sectional area of the core of 428cm^2. The maximum flux density in the core is 1.5 tesla. Calculate the number of turns in the primary and secondary windings.
   b) Write the applications of squirrel cage induction motor.
4. a) Transistor acts as an amplifier. Explain.
   b) Draw the input characteristics of CB configuration transistor.
5. a) Explain about D flip flop
   b) Explain different number system conversions with examples.
6. a) Draw and explain the Thevenin's equivalent circuit.
   b) State Ohm's law. Also mention its limitations.
7. Find the impedance and current of series RL circuit with R = 2Ω and L = 3mH excited by a voltage source v (t) = 100 sin (100πt+30°). Also draw its phasor diagram.
8. a) Explain the principle of operation of single phase transformer.
   b) Discuss the constructional features of an alternator.

Code No.: **50201**

MR 15

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I B.Tech I Semester Supplementary Examinations, DECEMBER-2017

SUBJECT: **Electrical Circuits**

Branch: **Common to EEE & ECE**

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

PART – A

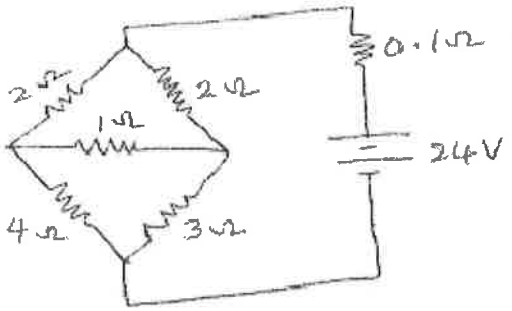
Answer All Questions **5x2Mark=10 Marks**

1. Define a) Ohm's law b) Kirchoff's Laws
2. Define (i) Sub Graph (ii) Loop
3. What is significance of Hysteresis Loop?
4. Define (i) Instantaneous value (ii) Maximum Value (iii) Cycle
5. What is meant by Locus diagrams?

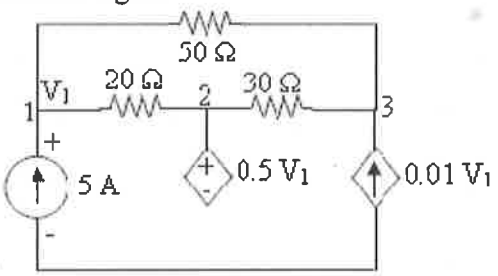
PART-B

Answer any five of the following questions **5x10 Marks= 50 Marks**

1. Determine the current through 0.1ohm resistor for the circuit shown in figure

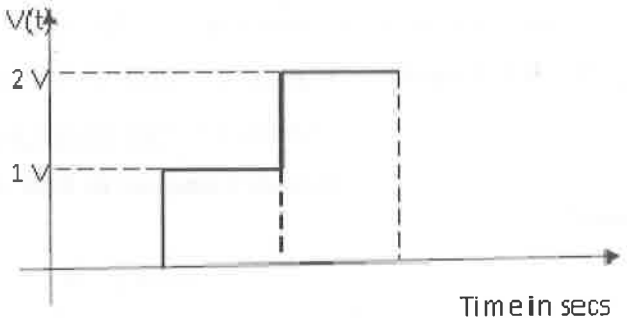


2. Use the nodal analysis to determine voltage at node 1 and the power supplied by the dependent current source in the network shown in figure



3. 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?

4. a) Find the RMS Value for the given wavform



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 parallel

5. Draw the Current, Impedance and Admittance for an RL-Series circuit having fixed resistance but variable reactance.

6. 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.

7. Explain the concept of formation of cut set and tie set matrices by a suitable example?

8. a) Briefly discuss the losses of hysteresis and eddy current in a magnetic circuit
   b) Explain the series magnetic circuit