# 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 END EXAMINATIONS, MAY-2019

Subject: <u>**Electrical Circuits**</u>

Branch: **Common to EEE & ECE**

Time: 3 hours   Max. Marks: 60

PART – A

Answer **ALL** questions of the following   5x2Marks=10 Marks

1. Define passive element and give example.
2. Define a) Graph b) co-tree
3. What are the Different Types of Statically Induced EMF's?
4. Explain the terms a) Impedance b) Admittance
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) Explain the differences between Practical sources and Ideal sources.
   b) Write short notes on star to Delta Transformation.
2. Find the value of resistance R, if the current is I=11 A and source voltage is 66 V as shown in figure
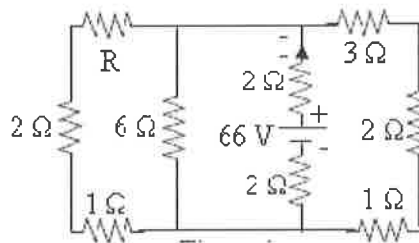
3. Draw a graph of the network shown in figure. Select a tree with branches R1, R2, R5, R3 and R4.Write fundamental loop matrix and cut set matrix.
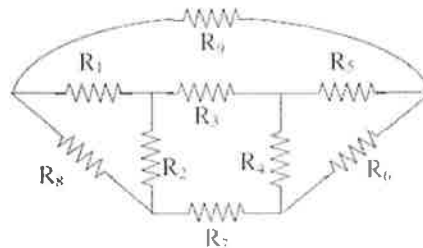
4. Write the node equation and solve for the node voltage and find the current for each resistor in the network shown.
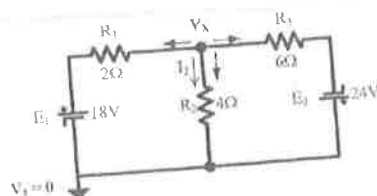
5. A) Derive the expression for coefficient of coupling between two magnetically coupled coils in Terms of their self and mutual inductance.
    B) Find the equivalent inductance for parallel coupled circuits

6. A) Write short notes on Dot convention used in magnetically coupled coils.
    B) A coil of 250 turns is wound on a magnetic circuit of reluctance 100000AT/Wb. If a current of 2A flowing in the coil is reversed in 5 m-sec, find the average EMF induced in the coil.

7. A pure inductance of 3 mH carries a current of the waveform shown in figure 1. Sketch the waveform of v(t) and p(t). Determine the average value of power.
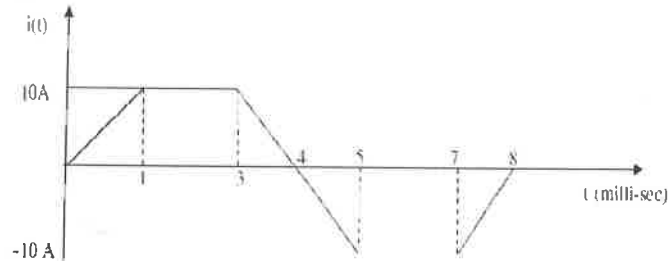
8. A) A Series RLC circuit has R=10Ω, L=0.5H and C=40μF the Applied voltage is 100V Find
    (i) Resonant Frequency (ii) Quality Factor (iii) Bandwidth (iv) Current at Resonance

    B) A series RLC circuit with R=100W, L = 0.5H, C=40μF has an applied voltage of 100 $\lfloor 0^\circ$ with variable frequency. Calculate the resonance frequency, current at resonance and voltage across R, L, and C. Also calculate the Q-factor, upper and lower cutoff frequencies?

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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019

Subject: **Basic Electrical & Electronics Engineering**

Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer **ALL** questions of the following

5x2Marks=10 Marks

1. Define self-inductance and mutual inductance.

2. Define power and power factor.

3. Write the constructional differences between core and shell type transformers.

4. List out the applications of Diode.

5. Write truth table for XOR gate.

PART-B

Answer any **FIVE** Questions of the following

5x10 Marks= 50Marks

1. a) Find Equivalent Resistance

   b) Explain series and parallel connection of resistors .

2. a) Explain passive and active elements.

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

3. a) Explain generation of a siewave.

   b) Find the RMS value of sinusoidal waveform $v(t) = V_m \sin (wt)$

4. a) Draw the phasor diagram of series RC circuit.

   b) What is difference between impedance and admittance?

5. a) Explain speed control method of three phase induction motor

   b) Write the differences between squirrel cage and slip ring induction motors.

6. a) Write the applications of slip ring induction motor.

   b) A Transformer having turns ratio of 4000/700, and frequency of 50HZ, Calculate the induced EMF in the secondary windings if fed with 230 volts?

7. a) Draw the V-I characteristics of PN-junction diode.

   b) Explain the operation of half-wave rectifier with neat sketch.

8. a) Explain the principle of operation of an amplifier.

   b) Write the importance and applications of basic logic gates.

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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019

Subject: **Engineering Graphics**

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

Time: 3 hours

Max. Marks: 60

Answer any **FIVE** Questions out of **EIGHT** Questions

5x12 Marks= 60Marks

1. Construct a parabola with base 60mm and the length of the axis 40mm. Draw a tangent to the curve at a point 20mm from the base. Also locates the focus and directrix to the parabola.

2. Draw a cycloid of a circle of diameter 50mm for one revolution. Also draw a tangent and a normal to the curve at a point 35mm above the base line.

3. The top view of a 75mm long line AB measures 50mm. A is 50mm in front of VP and 15mm below the HP. B is 15mm in front of the VP and is the above the HP. Draw the front view of AB and its inclinations with the HP and the VP.

4. The front view of a 75 mm long line measures 55 mm. The line is parallel to the H.P nad one of its ends is in V.P and determine its inclination with V.P.

5. A pentagonal pyramid, base 25mm side and axis 60 mm long has one of its triangular faces in the VP and the edge of the base contained by that face makes an angle of 30^0 with the HP. Draw its projections.

6. Draw the projections of a regular hexagon of 25mm side having one of its sides in the H.P. and inclined at 60° to the V.P. and its surface making an angle of 45° with the H.P.

7. a) Draw the isometric projection of a pentagonal pyramid with its axis vertical with base side 30mm and height 65mm.

   b) Draw the isometric view of a square prism with the side of base 40mm and length of the axis 70mm when its 70mm when its axis is (i) vertical (ii) Horizontal

8. Draw the elevation, top view and side view of the object shown in figure. All dimensions are given in mm.
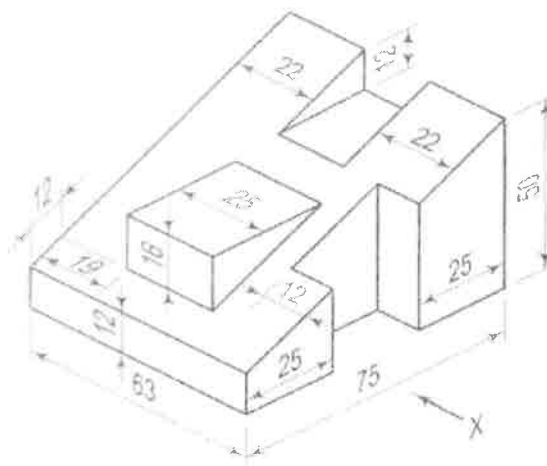
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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019

Subject: **Computer Programming**

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. What is the use of Translator?

2. Differentiate Break and Continue statements?

3. What is need for implementing recursion?

4. Differentiate Structure and Union?

5. What are the different modes of file operations?

PART-B

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

1. a) Write the Algorithm to check the given number is prime or not

   b) Explain Precedence and Association rules among operators?

2. 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?

3. a) Conditional Operator

   b) Write an algorithm to find the roots of quadratic equations?

4. a) Write the syntax for all Looping control structures in C?

   b) Write a program to perform multiplication of given two matrices?

5. a) Explain any five standard Functions in C with suitable examples?

   b) Write a program to perform addition of two numbers using Functions with arguments and no return values?

6. 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?

7. 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()?

8. a) Write a program to open a file in write mode and write some data in to it?

   b) Explain Bubble sort technique with example?

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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019

Subject: **Computer Programming And Numerical Methods**

Branch: **Common to ECE & EEE**

Time: 3 hours

Max. Marks: 60

PART – A

Answer **ALL** questions of the following

5x2Marks=10 Marks

1. What is the use of Translator?

2. Differentiate Break and Continue statements?

3. What is need for implementing recursion?

4. Differentiate Structure and Union?

5. Write the procedure to solve an algebraic equation using False-position method.

PART-B

Answer any **FIVE** Questions of the following

5x10 Marks= 50Marks

1. a) Write the Algorithm to check the given number is prime or not

   b) Explain Precedence and Association rules among operators?

2. 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?

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8. Evaluate $\int_0^1 \frac{1}{1+x^2}\, dx$ using Trapezoidal rule, Find the exact solution also.

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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019
Subject: Engineering Mathematics
Branch: **Common to CE, ME, EEE, ECE, CSE, & MINING**

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

PART – A
Answer **ALL** questions of the following   **5x2Marks=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. State Cayley – Hamilton Theorem

3. The integrating factor of $\dfrac{dy}{dx} - \dfrac{y}{x(x-1)} = x(x-1)$

4. The solution of $\dfrac{d^3y}{dx^3} + \dfrac{d^2y}{dx^2} = 0$

5. Find the Laplace transform of $t\cos at$

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. Test for consistency and hence solve $\quad x + y + z = 6, \quad x - y + 2z = 5,$
   $$3x + y + z = 8, \quad 2x - 2y + 3z = 7$$

3. Diagonalize the matrix A = $\begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$

4. Find the eigen values and eigen vectors of the matrix A = $\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$.

5. a) Find the orthogonal trajectories of the family of curves $y^2 + 2xy - x^2 = c$, where c is the parameter.
   b) Find the differential equation representing all circles passing through the origin and having their centres on the $y-$ axis.

6. a) Solve $e^x \tan y\, dx + \left(1 - e^x\right) \sec^2 y\, dy = 0$

   b) Solve $\left(1 + y^2\right) dx = \left(\tan^{-1} y - x\right) dy$.

7. Using the method of variation of parameters, solve $\dfrac{d^2y}{dx^2} + 4y = \tan 2x$.

8. Find inverse Laplace Transform of $\dfrac{1}{(s^2+9)^2}$ by using convolution theorem.

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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019
Subject: **Applied Physics - I**
Branch: **Common to CE, ME, MINING, EEE, ECE & CSE**

Time: 3 hours   Max. Marks: 60

PART – A

Answer **ALL** questions of the following   5x2Marks=10Marks

1. State the conditions for interference of light
2. Explicate Spontaneous and Stimulated transitions in laser.
3. Define reverberation time and write its unit
4. Write differences between mechanical and electrical oscillator
5. State Fermi-Dirac distribution law. Give its mathematical expression

PART-B

Answer any **FIVE** Questions of the following   5x10Marks=50Marks

1. a) Define coherence   [2+5+3]
    b) In the Young's double slit experiment if the silts and the screen are separated by 100cm, determine the fringe width, assuming the distance between the two slits is equal to 0.015cm and the wavelength of the light used is 6000 A°
    c) In Newton's rings experiment, the radius of curvature of Plano convex lens is 120cm. If the diameters of 10th and 15th dark rings are 0.35cm and 0.5cm respectively, then determine the wavelength of the light used.

2. a) Define interference. Discuss the conditions to be satisfied for obtaining constructive and destructive interference   b) What is cosine law?
    c) Briefly discuss how a diffraction grating can be used as monochromator

3. a) Explain the construction and working of semiconductor diode laser.   [3+2+5]
    b) Determine the acceptance angle of an optical fiber, if refractive indices of its core and cladding are 1.55 and 1.35 respectively.

4. a) Explain the basic principle of confining light in a step index fiber and hence obtain an expression for the critical angle and acceptance angle   [4+6]
    b) The refractive indices of core and cladding in an optical fiber are 1.3 and 1.2 respectively. Determine the numerical aperture of the optical fiber cable.

5. a) Explain the detection methods of ultrasonic waves through (i) Kundt's tube method (ii) Piezo electric detector method (iii) Sensitive flame method and (iv) Thermal detector method   (6+4)
    b) A lecture hall has volume of 9500 m^3. It has reverberation time of 1.5 Sec. What is the total absorption in the hall?

6. a) Define absorption coefficient and describe with necessary theory a method of measuring the absorption coefficient of a material.
    b) Discuss the applications of ultrasonics in Communication, Industrial, Biological and Medical fields.

7. a) What is the principle of superposition of waves? Find the resultant of two plane simple harmonic waves of the same period travelling in the same direction but differing in phase and amplitude. (6+4)
    b) Define sharpness of resonance and give a note on "smaller is the damping, sharper is the resonance" with help of a graph.

8. **Answer any TWO Questions**
    a) Write a short note on F-D statistics.   **(5)**   b) Rayleigh-Jeans Law   **(5)**
    c) Explain Concept of Electron gas.   **(5)**

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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019

Subject: **Applied Chemistry**

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

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

PART – A

Answer **ALL** questions of the following   **5x2Marks=10 Marks**

1. What is Calgon conditioning ? Write chemical reaction involved.

2. Write difference between primary and secondary batteries.

3. Write the synthetic chemical equation of PVC?

4. What is Octane number? Write its significance?

5. What is R4M4?

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) What is carbonate and non carbonate hardness of water?

   b) Explain Ion exchange process in detail with a neat labeled diagram

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) Explain the working principle of Ni-Cd batteries.

   b) Discuss sacrificial anodic protection with an example.

5. a) Explain compression moulding with a neat diagram.

   b) What are conducting polymers? Write its classification and applications

6. a) What are synthetic rubbers? Discuss the synthesis and applications of Buna-S and Butyl rubber

   b) What is polymerization? Explain the free radical mechanism.

7. a) Discuss fixed bed catalytic cracking of petroleum.

   b) Calculate the mass of air needed for complete combustion of 5.0 kg of coal containing 80% C, 15% H and the rest oxygen.

8. 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.