Code No.: **50H01**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **English**

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

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

**I. Answer all the questions** **5 x 2 = 10 Marks**

1. **a) Find an adjective of the following word.** **[1M]**

   Usage

   **b) Fill in the following blank with suitable verb form given in the bracket.** **[1M]**

   Sheetal _____ (watch) TV for 2 hours.

2. **a) Fill in the blank with suitable word from the bracket.** **[1M]**

   _____ (Its/It's) a major problem associated with it.

   **b) Transfer the following sentence into direct speech.** **[1M]**

   The committee advised them to keep the records in order.

3. **a) Supply a question tag to the following.** **[1M]**

   The teacher left the class, _____ ?

   **b) Use the following phrasal verb in your own sentence.** **[1M]**

   "sign off"

4. **a) Transform the following into a direct voice sentence.** **[1M]**

   The presentation was done well by the students.

   **b) Supply a one word substitution.** **[1M]**

   The person who loves reading books

5. **a) Join these two sentences.** **[1M]**

   You can take a chocolate.

   You can choose to take a biscuit.

   b) She is not coming for the movie. **[1M]**

   She is not coming for the class

## PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. "…I feel I ought to take this occasion to give expression to some of my reflections thereon". What reflections does Dr.B.R. Ambedkar share in his speech 'Grammar of Anarchy?'

2. Do you think the title 'Wheels of change' is apt for Mala Suresh Kumar's life? Justify your answer.

3. a) "Do not tolerate injustice. Do not look away when you see people doing wrong. Seek the courage within yourself to stand up to it." How to fight the rot, and reclaim our India, according to Pritish Nandy?

   b) Dr.A.P.J. Abdul Kalam was a visionary. Write briefly about his vision for India.

4. a) Why is it important to be honest and not lie?

   b) Which is your favourite day of the week?

5. Write a review of the short story, Death of a Hero" by Jai Nimbkar.

6. a) Write a short note on 'Impact of social media on education today.'

   b) Write a short note on 'Importance of Arts and music in college education.'

7. **a)** Write a letter to your friend about your college fest.

   b) Draft a letter to your Principal requesting him to grant leave for attending your sister's marriage.

8. Write the summary of 'Once there was a King'

Code No.: **50202**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

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Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Basic Electrical & Electronics Engineering**

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

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

**Answer all the questions** **5 x 2 = 10 Marks**

1. Give the statement of Thevenin's theorem.
2. A resistance of 200 Ω and an inductance of 400 mH is connected in series, is input supply frequency is 50 Hz, determine the power factor of the circuit.
3. What is the principle of operation of 1-Φ transformer?
4. Distinguish between N-Channel MOSFET & P-Channel MOSFET.
5. Write the truth tables for the following logic gates
   (i) XOR (ii) NAND

## PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. a) i) Distinguish between Active and passive elements. **(2M)**
   ii) Derive the equation for co-efficient of coupling. **(3M)**
   b) State and prove Maximum power transfer theorem by considering any circuit. **(5M)**

2. a) A wire of 100 Ω resistance is cut into how many equal pieces so that when they are connected in parallel resultant is 1 Ω. **(5M)**
   b) Derive an expression for total resistance when two resistors are connected in i)Series ii) Parallel. **(5M)**

3. A coil has an inductance of 0.05 H and a resistance of 10Ω. It is connected to a sinusoidal 200 V, 20 Hz supply. Calculate the impedance, current, power consumed and power factor.

4. a) A circuit consists of two branches connected in parallel across the 100V, 50HZ supply.
   Ist branch: R=200 Ω, IInd branch: R=50Ω,C=30μF.
   Calculate branch currents and total current. **(5M)**
   b) In how many ways Power factor can be defined? Explain its importance in Electrical Circuits. **(5M)**

5. a) Explain the Principle of operation of 3phase Induction motor. **(5M)**
   b) Derive the condition for maximum efficiency of single phase transformer. **(5M)**

6. a) Mention the applications of squirrel cage and slip ring Induction motor. **(5M)**
   b) Write short notes on Speed-torque characteristics of induction motors. **(5M)**

7. a) Draw and explain input and output characteristics of NPN transistor. **(5M)**
   b) Explain the working of PN junction diode as full wave rectifier. **(5M)**

8. a) What are the different logic gates? Give their truth tables. **(5M)**
   b) Draw the logic circuit for the following expression. **(5M)**
   $ABC + A\bar{B}\bar{C} + A\bar{B}C + AB\bar{C} + \bar{A}\bar{B}C$

Code No.: **50B06**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Computational Mathematics**

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

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

**I. Answer all the questions** **5 x 2 = 10 Marks**

1. Find $\phi(x)$ to solve $x^3 + x^2 - 1 = 0$ in [0 1] used in Iteration method.
2. Show that $\nabla\Delta = \Delta - \nabla$.
3. State Simpson's ⅓ rule and ⅜ rule.
4. Find y(0.1) by Euler's method, given that $\frac{dy}{dx} = 1 - y$, $y(0) = 0$
5. Classify the equation $\frac{\partial^2 u}{\partial x^2} + 4\frac{\partial^2 u}{\partial x \partial y} + 4\frac{\partial^2 u}{\partial y^2} - \frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} = 0$

## PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. a) Find the positive root of x-cosx=0 by using bisection method.
   b) Find the square root of 24 by Newton Raphson method.

2. a) Find the root of the equation $xe^x = 1$ using the Newton – Raphson method correct to 4 decimal places.
   b) Using fixed point iteration method, (i) find the convergence condition and also (ii) find a positive real root of $2x - \log_{10} x = 7$ correct to 4 decimal places.

3. a) Find the polynomial which fits the data in the following table using Gauss-Forward formula.

| x | 3 | 5 | 7 | 9 | 11 |
|---|---|---|---|---|---|
| y | 6 | 24 | 58 | 108 | 174 |

   b) Evaluate $\Delta^n(ab^x)$

4. a) Find the missing value from the table

| x | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|
| y | 5.6 | 8.6 | 13.9 | --------- | 35.6 |

   b) Using lagranges formula, fit a polynomial to the data, given

| x | 0 | 1 | 3 | 4 |
|---|---|---|---|---|
| y | -12 | 0 | 6 | 12 |

   Also find y at x=2.

5. A simply supported beam carries a concentrated load P (Kg) at its mid-point. Corresponding to various values of P, the maximum deflection Y (Cm) is measured. The data are given below

| P | 100 | 120 | 140 | 160 | 180 | 200 |
|---|---|---|---|---|---|---|
| Y | 0.45 | 0.55 | 0.60 | 0.70 | 0.80 | 0.85 |

Find a law of the form $Y = a + b\,P$. Also find the maximum deflection for the applied load 202 Kg.

6. a) Using Simpson's $3/8$ th rule evaluate $\int_0^6 \frac{dx}{1+x^2}$ by dividing the range into 6 equal parts.

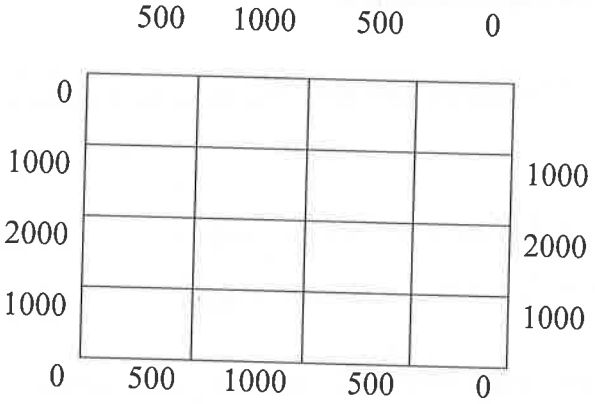
   b) Find $f^1(3)$ and $f^{11}(3)$ for the following data.

| x | 3.0 | 3.2 | 3.4 | 3.6 | 3.8 | 4.0 |
|---|---|---|---|---|---|---|
| f(x) | -14 | -10.032 | -5.296 | -0.256 | 6.672 | 14 |

7. a) Find the value of y at x=0.1 by Picard's Method given that $\frac{dy}{dx} = \frac{y-x}{y+x}$, y(0)=1

   b) Find y (0.1) using Euler's Modified formula, given that $\frac{dy}{dx} = x^2 - y$, $y(0) = 1$

8. Solve the Laplace equation $u_{xx} + u_{yy} = 0$ for the following square with boundary values as shown in the diagram



Code No.: **50B07**

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Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Applied Physics - II**

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

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

**I. Answer all the questions** **5 x 2 = 10 Marks**

1. Calculate susceptibility of a paramagnetic substance at 350K. (if the susceptibility at 300K is $1.3\times10^{11}$
2. Calculate the de-Broglie wavelength of electron moving with one tenth of the velocity of light.(where: $m_e = 9.1\times10^{-31}$ kg and $c = 3\times10^{8}$ m/s)
3. Mention the drawbacks of classical free electron theory?
4. What is top-down and bottom-up approach for synthetic of Nanometer?
5. What is coloumb's law?

## PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. a) Explain anti ferromagnetism and ferrimagnetism.
   b) Explain Type-I and Type-II superconductors.

2. a) Derive susceptability of super conductor in Ideal condition.
   b) Write short notes on numerical displays.

3. a) Derive Schrodinger's time independent wave equation.
   b) Explain the physical significance of wave function $\Psi$.
   c) Explain the terms potential well and potential barrier. How does a particle with energy lower than the barrier height, tunnel through it?. Give one example. **(4M+2M+4M)**

4. a) Calculate the energy of particle in one dimensional potential box of width $1A^0$ unit in its ground state.
   b) Find the probability of finding the particle at center of the box in ground state having width of $2A^0$.

5. a) Show that the Fermi level is nearer to the conduction band in n-type semiconductors. Discuss the variation of conductivity with temperature of an n-type semiconductor
   b) What is LED? Explain the construction and working of LED? **[6+4M]**

6. a) What is Bloch theorem? Explain.
   b) Write notes on Liquid Crystal Display.

7. a)What are nanomaterials? Explain why the properties of nanoparticles are different
   b) Explain synthesis of nanoparticles through ball milling method? **(6M+4M)**

8. a) Explain about gradient of scalar field and its physical significance.
   b) What are the differences between divergence and curl of vector field?

Code No.: **50B03**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

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## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Applied Chemistry**

Branch: Common to **EEE, ECE & CSE**

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

**I. Answer all the questions** **5 x 2 = 10 Marks**

1. Explain the terms:
   a. Priming b. Foaming
2. Draw the diagram of a Galvanic cell indicating the electrode reactions.
3. Write the preparation, properties and engineering applications of Nylon-6.
4. Explain how solar energy is a renewable source of energy.
5. What do you mean by $R_4$ in green chemistry?

## PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. What are Boiler troubles? Explain them in detail.

2. a) A sample of water is found to contain 40.5 mg/L $Ca(HCO_3)_2$, 46.5 mg/L $Mg(HCO_3)_2$, 27.6 mg/L $MgSO_4$, 32.1 mg/L $CaSO_4$ and 22.45 mg/L $CaCl_2$. Calculate the total hardness of water (At.Wts; Ca = 40, Mg = 24, Cl = 35.5, C=12, S = 32, 0=16 and H=1).
   b) Discuss the internal treatment of water.

3. a) Explain the copper electroplating ?
   b) Explain the Galvanization process.

4. a) Write short notes on calomel electrode.
   b) Describe the process of compression moulding with a neat diagram.

5. Describe the preparation, properties and engineering applications of
   a) Teflon b) Bakelite c) Nylon-6,6

6. a) What is natural rubber? Explain vulcanization of rubber.
   b) Write the preparation, properties and uses of butyl rubber.

7. a) Write short notes on Wind Power and hydro power.
   b) Give the classification of fuels basing on their occurrence and physical state, with relevant examples.

8. a) Discuss the applications of fibre reinforced composites.
   b) Write a short note on biosensors.

Code No.: **50582**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Data Structures Through C**
Branch: Common to **EEE & ECE**

Time: **3 Hours** Max Marks: **60 Marks**

### PART-A

**I. Answer all the questions** **5 x 2 = 10 Marks**

1. Give an example of linear and nonlinear data structures.
2. State the main idea behind selection sort.
3. List the two advantages and disadvantages of linked list?
4. List the application of Queue.
5. Compare binary tree and binary search tree.

### PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. a) Explain difference between linear and nonlinear data structures with suitable example.
   b) Write a C program to calculate GCD of two numbers using recursion? (6M +4M)
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. Briefly explain different text modes in files with syntax's.
4. a) What is directives? Explain features of preprocessors.
   b) What is sorting? Explain different sorting techniques.
5. What is single linked list? Write a C Program to perform Insertion and Deletion operations in Single Linked List.
6. a) Define Self Referential Structure? Explain the Node structure in Circular linked list with example.
   b) Write a C program to implement the sparse matrix using arrays.
7. Write a C program to implement Queue operations using linked list.
8. a) Insert the following elements in a binary search tree 40,20,60,30,50,80,10,70,100,90.
   b) Explain binary search with suitable example.

Code No.: **50301**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Engineering Graphics**
Branch: **Common to EEE & ECE**

Time: **3 Hours** Max Marks: **60 Marks**

**Answer any 5 questions** **5 x 12 = 60 Marks**

1. a) Draw a parabola if the distance of the focus from the directrix is 60mm.
   b) Construct a hyperbola, when the distance of the focus-directrix is 65mm and eccentricity is 3/2.

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. a) The front view of a line, inclined at 30° to the VP is 65mm long. Draw the projections of the line, when it is parallel to and 40mm above the HP., its one end being 30 mm in front of the VP.
   b) Draw the projections of the following points, keeping the distance between the projectors 30 mm on the same reference line:
      (i) 25 mm above H.P. and 45 mm in front of V.P.
      (ii) 35 mm above H.P. and 50 mm behind V.P.
      (iii) 40 mm below H.P. and 45 mm in front of V.P.
      (iv) 30 mm below H.P. and 40 mm in front of V.P.

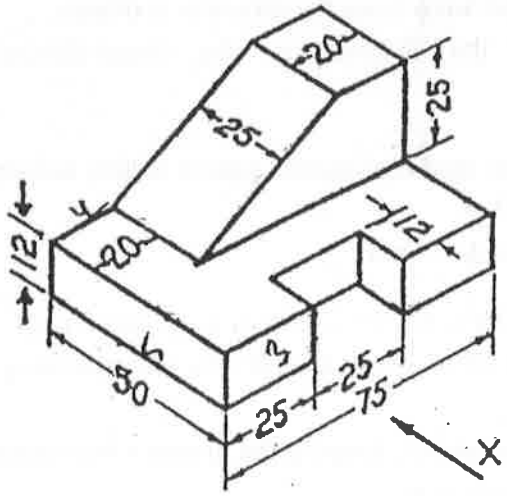
4. a) A point 30mm above xy line is the plan view of two points P and Q. the elevation of P is 45mm above the H.P. while that of the point Q is 35mm below the H.P. Draw the projections of the points and state their position with reference to the principal planes and the quadrant in which they lie.
   b) Two pegs fixed on a wall are 4.5 m apart. The distance between the pegs measured parallel to the floor is 3.6m. If one peg is 1.5 m above the floor, find the height of the second peg and the inclination of the line joining the two pegs, with the floor.

5. A regular pentagon of 30 side, is resting on one of its edges on H.P, which is inclined at $45^0$ to V.P. Its surface is inclined at $30^0$ to H.P. Draw its projections.

6. A circular plate of negligible thickness and 50mm diameter appears an ellipse in the front view, having its major axis 50mm long and minor axis 30mm long. Draw its top view when the major axis of the ellipse is horizontal..

7. A hexagonal prism, side of base 25 mm and axis 50 mm long rests on its base in H.P. Its axis is parallel to V.P. Draw the orthographic projections and provide the isometric projection of the solid. Show the isometric scale.

8. Figure shows the Isometric view of the object. Draw the front view, Top view, and side view.



Code No.: **50203**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Electrical Circuit Analysis And Synthesis**

Branch: **EEE**

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

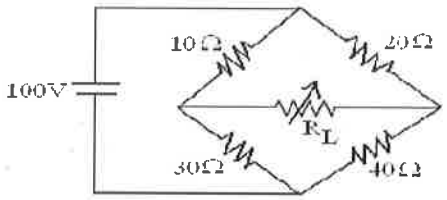
**Answer all the questions** **5 x 2 = 10 Marks**

1. In an AC circuit explain method to find Thevenin's equivalent circuit.
2. What are three phase balanced and three phase unbalances circuit mean?
3. Write ABCD parameter representation for a two port network.
4. What is meant by critically damped response? Explain.
5. Explain whether $s^4+s^3+2s^2+3s+2$ is Hurwitz polynomial or not.

## PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. State the maximum power transfer theorem and determine the load resistance to receive maximum power from the source, also find the maximum power delivered to the load in the circuit shown in below figure. **[10]**




2. a) State and prove the Millman's theorem **[5]**
   b) State and explain compensation theorem **[5]**

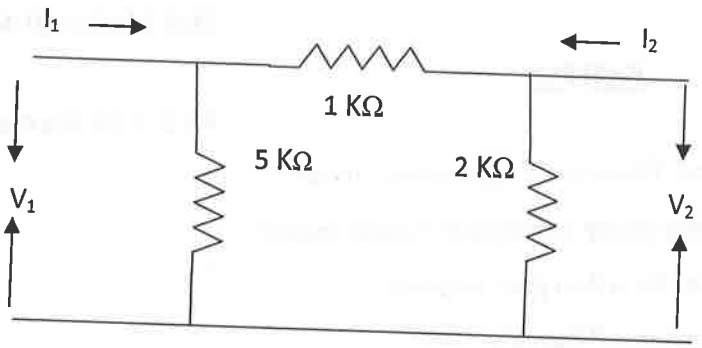
3. Explain the measurement of power by using two-wattmeter method. Also discuss the effect of power factor on wattmeter readings.

4. a) A positive-sequence, balanced Δ-connected source supplies a balanced Δ-connected load. If the impedance per phase of the load is 18+j12 Ω and the line current Ia is 35202.19 A, find the phase current ($I_{AB}$) and phase voltage ($V_{AB}$) **[5]**
   b) With the help of phasor diagram find the relations between line voltage and phase voltage in balanced star connected load system **[5]**

5. a) Obtain the h-parameters in terms of Y- parameters. **(5)**

   b) Obtain the h-parameters of a two-port network if its z-parameters are $[Z] = \begin{bmatrix} 2 & 1 \\ 1 & 4 \end{bmatrix}$. **(5)**

6. a) Find the Y parameters of the given network **[5]**




   b) Obtain Z parameters in terms of ABCD –parameters **[5]**

7. a) Write the procedure to evaluate initial conditions in RLC circuits. **(5)**

   b) Write Initial conditions of Transient Response. **(5)**

8. Synthesize the network in the two Foster forms (RL impedance and RC admittance) of the given function **[10]**

$$F(s) = \frac{(s+1)(s+5)}{(s+3)(s+7)}$$

Code No.: **50401**

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# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Electronic Devices And Circuits**

Branch: **ECE**

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

**Answer all the questions** **5 x 2 = 10 Marks**

1. Draw the V-I characteristics of forward biased PN junction diode.
2. Draw the symbols for SCR, LED.
3. Define α, β & γ of a transistor.
4. Write any three applications of JFET.
5. What are different Compensation Techniques?

## PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. a) A Silicon Diode has a saturation current of 7.5 μA at room temperature 300°K. Calculate saturation current at 400°K. **(5)**
   b) Derive the expression for the diffusion capacitance $C_D$ in case of P-N junction diode. **(5)**

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. Explain the Bridge rectifier circuit operation with neat circuit and waveforms. Why bridge rectifier is preferred then centre tapped rectifier. Derive (i) $I_{dc}$ (ii) TUF (iii) Ripple factor (iv) Efficiency (v) Form factor. **(10)**

4. a) Show that ripple factor of full wave rectifier with capacitive filter is $\gamma = \frac{1}{4\sqrt{3}fcR_L}$. **(6)**
   b) Difference between LED and LCD. **(4)**

5. A transistor has $I_B$ = 100 mA and $I_C$ = 2 mA.
   Find:
   a) α of the transistor b) β of the transistor c) emitter current
   d) if $I_B$ changes by +25 μA and $I_C$ changes by +0.6 mA, find the new values of β.

6. a) Define α, β and deduce the relation between them. **(5)**
   b) Derive Reach-Through (or) Punch-Through. **(5)**

7. a) Explain the principle of operation for FET.
   b) Show in FET $\mu = g_m * r_d$.

8. a) Derive an expression for the stability factor of a collector- to base bias circuit.
   b) Distinguish between D.C and A.C load lines with suitable diagrams.

Code No.: **50503**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Data Structures**
Branch: **CSE**

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

**Answer all the questions** **5 x 2 = 10 Marks**

1. Define time and space complexity.
2. Write any two differences between Single Linked List and Double Linked List.
3. List the applications of stack.
4. Define Binary Tree and Binary Search Tree.
5. State the properties of Red black tree.

## PART-B

**Answer any 5 questions** **5 x 10 = 50 Marks**

1. a) Explain asymptotic notations with an examples.
   b) Define Recursion. Write a c program to generate factorial using recursion.

2. a) Give the recursive algorithm to calculate GCD of two numbers.
   b) Write a C program that uses functions to create a singly linked list of integers.

3. a) Differences between single linked list and circular linked list.
   b) Define double linked list and explain its operations.

4. a) List the advantages and disadvantages of doubly linked list over singly linked list?
   b) Write short notes on reversing list.

5. a) Write an algorithm to insert and delete a key in a circular queue.
   b) Write a C program to Convert Infix Expression to Postfix Expression

6. Write a C program to implement Stack operations using linked list

7. Define Binary Tree. Write a C program to perform recursive implementation of Binary Tree traversal methods.

8. a) Explain the following splaying in splay-tree.
      i) zig-zag ii) zag-zag
   b) Write short notes on AVL Tree.

Code No.: **50301**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Engineering Graphics**

Branch: **CSE**

Time: **3 Hours** Max Marks: **60 Marks**

**Answer any 5 questions** **5 x 12 = 60 Marks**

1. The vertex of hyperbola is 35 mm from the focus. Draw the curve if the eccentricity is 3/2. And also draw normal and tangent to the curve at a distance 35 mm from the directrix.

2. A circle of 50 diameter rolls on a horizontal line for half a revolution clock-wise and then on a line inclined at $90^0$ to the horizontal for another half, clock-wise. Draw the curve traced by a point P on the circumference of the circle, taking the top most point on the rolling circle as the initial position of the generating point.

3. a) The front view of a 75 mm long line measures 55 mm. the line is parallel to the H.P and its one of its ends is in the V.P and 25 mm above the H.P. Draw the projections of the line and determine its inclination with the V.P.
   b) Two points A and B are in the H.P. The point A is 30 mm in front of the V.P. while B is behind the V.P The distance between their projectors is 75 mm and line joining their top views makes an angle of $45^0$ with the XY. Find the distance of the point B from the V.P.

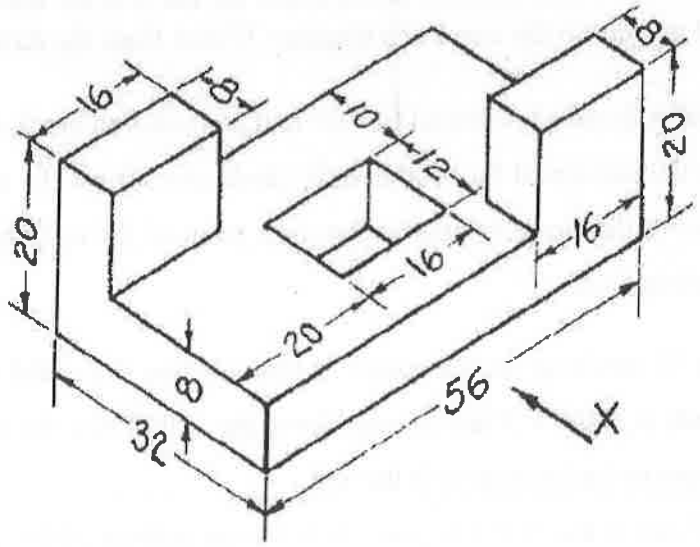
4. a) A point P is 20mm below HP and lies in the third quadrant. Its shortest distance from xy is 40mm. Draw its projections.
   b) Two pegs fixed on a wall are 4.5 m apart. The distance between the pegs measured parallel to the floor is 3.6m. If one peg is 1.5 m above the floor, find the height of the second peg and the inclination of the line joining the two pegs, with the floor.

5. An equilateral triangular plane ABC of side 35, has its plane parallel to V.P and 20 away from it. Draw the projections of the plane when one of its sides is
   (i) Perpendicular of H.P (ii) Parallel to H.P (iii) Inclined to H.P at an angle of $45^0$.

6. A hexagonal prism, base 30 mm side and axis 75 mm long, has an edge of the base parallel to the H.P. and inclined at $45^0$ to the V.P. its axis makes an angle of $60^0$ with the H.P. Draw its projections.

7. A cylinder of diameter of base 40 and axis 55 long, is resting on its base on H.P. It is cut by a section plane, perpendicular to V.P and inclined at $45^0$to H.P. The section plane is passing through the top end of an extreme generator of the cylinder. Draw the development of the lateral surface of the cut cylinder.

8. Figure shows the Isometric view of the object. Draw the front view, Top view, and side view



Code No.: **50303**

**MR15 (2016-17 Admitted students) Regular & (2015-16 Admitted students) Supply**

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## I B.TECH II SEM REGULAR & SUPPLEMENTARY EXAMINATIONS, MAY - 2017

SUBJECT: **Engineering Mechanics**

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

Time: **3 Hours** Max Marks: **60 Marks**

## PART-A

**Answer all the questions** **5 x 2 = 10 Marks**

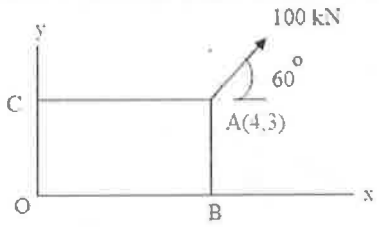
1. Define coplanar non-concurrent forces
2. Define Free body diagram
3. Define the terms 'moment of inertia' and 'radius of gyration'.
4. Define the terms velocity and acceleration.
5. Define momentum?

## PART-B

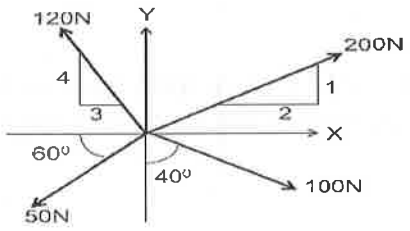
**Answer any 5 questions** **5 x 10 = 50 Marks**

1. a) The resultant of two forces is 400 N. If the forces are inclined at $40^o$ and $60^o$ with the resultant, one on either side, calculate the magnitude of the two forces. **[4M]**

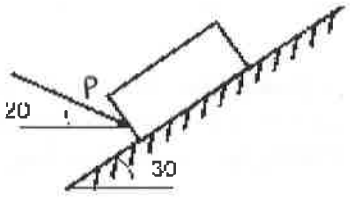
   b) Replace the force shown in fig. by an equivalent force-couple system (i) at the origin O, (ii) at the point B, and (iii) at the point C. **[6M]**



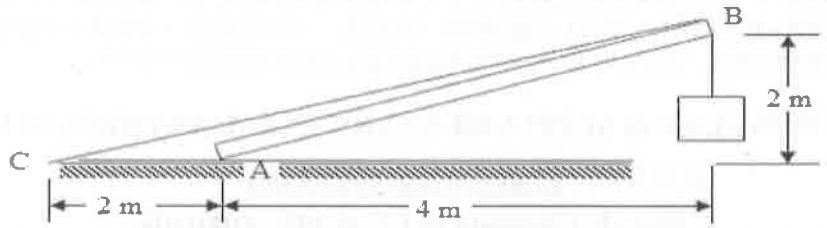

2. a) A system of four forces acting on a body is shown in fig. Determine the resultant. **[5M]**



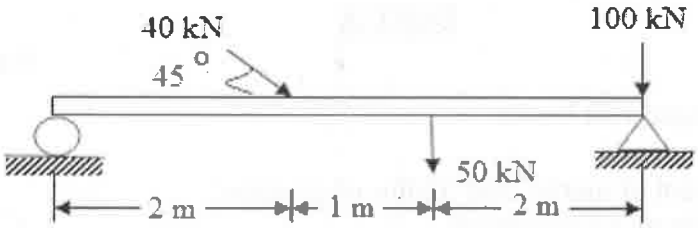

   b) The body on the 30° incline in figure is acted upon by a force P inclined at 20° with the horizontal. If P is resolved into components parallel and perpendicular to the incline and the value of the parallel component is 300N, compute the value of the perpendicular component and of P. **[5M]**



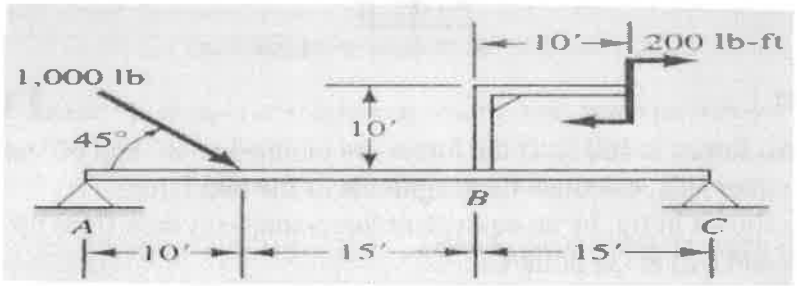
3. a) Find the tension T in the cable BC and the force S in the strut AB shown in fig. . The weight of the block suspended is 1000 N. **[6M]**



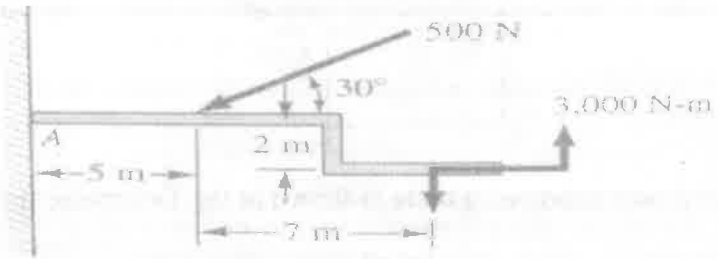

b) Determine the support reactions for the beam loaded as shown in fig. . Neglect the weight of the beam. **[4M]**



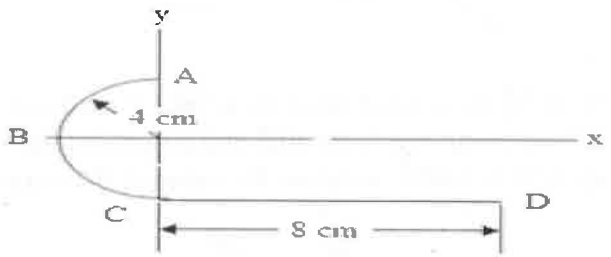

4. a) Given the indicated forces, what is the moment of these forces about points A and B? **[5M]**




b) What is the moment about A of the 500-N force and the 3,000-N-m couple acting on the cantilever beam? **[5M]**



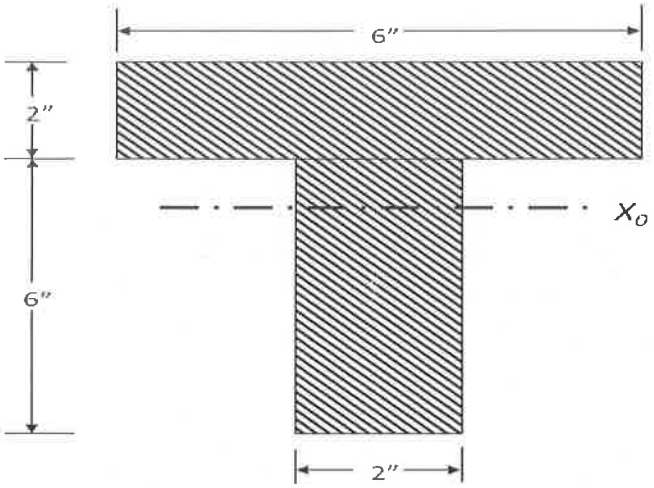

5. a) A slender homogeneous wire 'ABCD' of uniform cross section is bent into the form shown in fig. . Determine the position of the centroid of the wire with respect to the given axes. **[5M]**




b) Determine the centre of mass of a composite body formed by placing a brass cone with a base diameter 10 cm and 15 cm height over a steel cylinder of same diameter and a height of 12 cm. Density of steel is 7850 Kg/m$^3$ and that of brass is 8650 Kg/m$^3$. **[5M]**

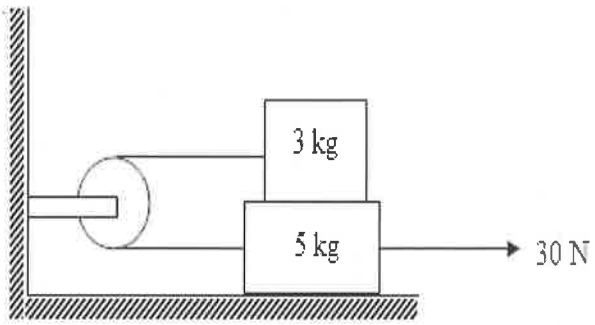
6. a) Determine the mass moment of inertia of circular plates of radius 'R' and thickness 't' about its centroidal axis **[5M]**

b) Determine the moment of inertia of the T-section shown in figure about its centroidal $X_o$ axis. **[5M]**




7. a) The angular motion of rigid body is defined by the relation $\theta = 3t + 2t^2 - t^3$ m, where $\theta$ is in radians and t is in seconds. Determine the angular position, velocity and acceleration at t= 2s. Also, determine the angular acceleration when angular velocity is zero. **[5M]**

b) In fig., a force of 30 N is applied on the lower block of 5 kg mass, over which another block of mass 3 kg mass rests. Determine the acceleration of the blocks and the tension in the string assuming it to be inextensible. The coefficient of kinetic friction for all contact surfaces is 0.15. **[5M]**




8. a) Derive the work energy equation for general plane motion. **[5M]**

b) State the principle of conservation of momentum. Give two examples where this principle is applied. **[5M]**