Code No.: **70201** | **MR17**

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: **Basic Electrical and Electronics Engineering**

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

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

PART – A

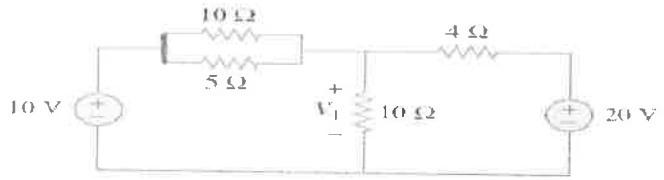
Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Define Linear and bilateral element
2. Relation between magnetic flux dencity (B) and magnetic field strength (H) .
3. Draw impedance triangle for RC series Circuit.
4. What is Depletion layer
5. What is Rectifier?

PART-B

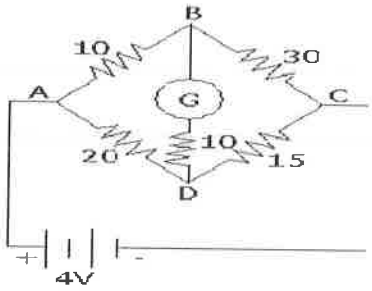
Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. Determine V1 using nodal analysis.



OR

2. Determine the current in all the bridge arms of the circuit as shown in fig. Find the value of the current through the galvanometer and its direction (Galvanometer and all resistances are in ohms).



3. Derive the expression for coefficient of coupling.

OR

4. Bring out an analogy between magnetic circuits and electric circuits.
5. Explain the sinusoidal response of series RL circuit with circuit diagram, phasor diagram and waveforms along with mathematical expressions.

OR

6. Explain the sinusoidal response of series RC circuit with circuit diagram, phasor diagram and waveforms along with mathematical expressions.
7. A) Explain band structure of open circuit PN junction diode
   B) Explain current components of PN junction diode.

OR

8. A) Explain formation of depletion layer
   B) Write about barrier potential
9. A)Discuss about load line analysis of diode
   B) Explain Zener diode as voltage regulator

OR

10. Explain working of centre tap full wave rectifier.

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

Subject: **Engineering Graphics**

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

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

Answer **ALL** questions of the following **5x12 Marks= 60Marks**

1. The distance between two towns is 225 km. a train covers this distance in 5 hours. Construct a scale to measure off the distance covered by the train in a single minute and up to 1 hour. The scale is drawn to 1/(300000). Show on it the distance covered in 47 minutes.

OR

2. A) Construct a diagonal scale to read up to 1/100 of kilometers having given the value of R.F. = 1/50,000 and to measure up to 8 kilometers. Indicate on the scale, a distance of 6.76 kilometers.
   B) The ordinate of a point P on the curve is 50mm& is at a distance of 25mm from the vertex. Draw the parabola.
3. A circular plate of negligible thickness and 50mm diameter is vertical and inclined at 45° to VP. Draw its projections when the centre of the circular lamina is 40mm above HP and 60mm in front of VP.

OR

4. A regular hexagonal lamina of 30 mm side rests with one of its edges CD parallel to HP. Its plane is inclined at 45^0 to HP and Draw its projections.
5. A hexagonal prism of base side 30mm, axis height 50mm is resting on HP on one of its base corners with its base inclined at 35° to HP and parallel to VP. Draw the projections of the prism.

OR

6. Draw the projections of a cone, base 45 mm diameter and axis 50 mm long, when it is resting on the ground on a point on its base circle with **(a)** the axis making an angle of 30° with the HP and 45° with the VP
7. Explain the procedure for drawing isometric projections using box method with an example.

OR

8. A vertical cylinder of base diameter 50 mm and height 70 mm is cut by a plane inclined at 55^0 to HP and perpendicular to VP, which meets the axis at a distance of 20 mm from top base. Draw the isometric view of the remaining portion of the cylinder.
9. Draw the orthographic projections of the object whose isometric view is shown in FIG 1.

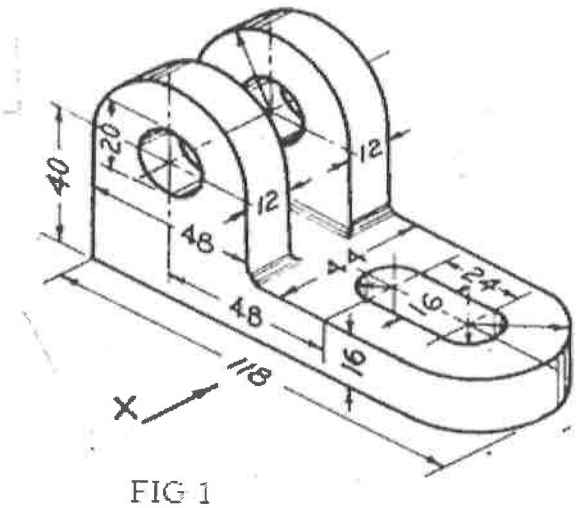

FIG 1

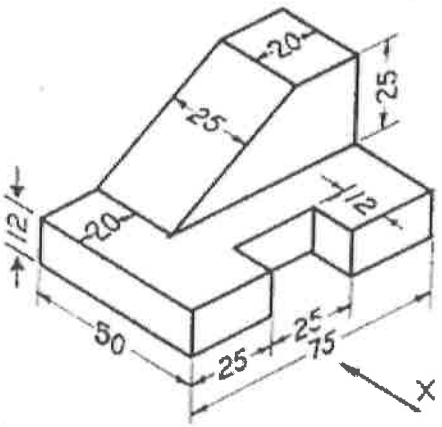

FIG 2

OR

10. Draw the front view, top view & side view for the part shown in FIG 2. All dimensions are in mm.

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

Subject: **Computer Programming**

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

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

PART – A

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

1. List the types of operators in C?
2. What is array? How to store elements in an array?
3. Difference between calloc() and realloc()?
4. What is the difference between structure and union?
5. What are status functions?

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. a) What are the different symbols used in a flowchart? Draw a flowchart for finding the factorial of a given number. [6M]
   b) Write a program for finding the largest among three numbers. [4M]

OR

2. a) Explain the following.
   i) Volatile ii) constant iii) variable. [6M]
   b) Draw the flowchart of finding largest of three positive numbers. [4M]
3. What is the difference between if and switch statements? Write a program for simple calculator using switch case.

OR

4. a) Explain various jump statements in C.
   b) Write a C program to check weather given number is Armstrong or not
5. a) Explain following string handling functions
   i) strlen() ii) strcat()
   b) Write a C Program to Count Number of Vowels in a given string.

OR

6. a) Write a C program to accept a string and returns true if the string is palindrome and false if it is not.
   b) Discuss pointer arithmetic with suitable example.
7. a) Write a c program to implement nested structures
   b) Write a c program to find factorial of given number using recursion

OR

8. a) What is a structure? How is a structure different from an array? [4M]
   b) Write a program using structures to store and display student information. [6M]
9. Write a program to open a file in write mode and write some data in to it?

OR

10. a) Write a C Program to implement Insertion sort.
    b) Describe the fopen() and fclose() functions with an example.

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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, IT & MINING**

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

PART – A

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

1. Find 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. Verify the Cayley-Hamilton theorem for the matrix $\begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$.
3. Solve the differential equation $x\,dy - y\,dx + a(x^2 + y^2)\,dx = 0$
4. Solve $(D^2 + 2D + 1)y = x$ where $D = \frac{d}{dx}$.
5. Find $L\left\{\frac{sint}{t}\right\}$.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. a) Define the rank of the matrix and find the rank of the following matrix.

$$A = \begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$$

   b) Determine whether the following equations will have a non-trivial solution if so solve them. $4x + 2y + z + 3w = 0$, $6x + 3y + 4z + 7w = 0$, $2x + y + w = 0$.

OR

2. For what values of k, the equations $x+y+z=1$, $x+2y+4z=k$, $x+4y+10z-k^2$ have a solution and solve them completely in each case.
3. Reduce the quadratic form $2xy + 2yz + 2zx$ into canonical form hence find its rank, index, signature and nature.

OR

4. Using Cayley - Hamilton theorem, find the inverse of $A = \begin{pmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{pmatrix}$

5. a)Solve $(y\log y)dx+(x-\log y)dy=0$

   b) Find the orthogonal trajectory of the family of curves $r^n=a\sin n\theta$

OR

6. a)Solve $\frac{dy}{dx}-\frac{\tan y}{1+x}=(1+x)e^x\sec y$

   b) Prove that the system of parabolas $y^2=4a(x+a)$ is self orthogonal

7. a) Solve the differential equation: $(D^2+1)y=\sin x\sin 2x$. **[5+5]**

   b) Solve the differential equation $x^2\frac{d^2y}{dx^2}-2x\frac{dy}{dx}-4y=x^4$

OR

8. a) Solve the differential equation $\frac{d^2y}{dx^2}+2\frac{dy}{dx}+y=e^{2x}-\cos^2 x$.

   b) Solve the differential equation $x^2\frac{d^2y}{dx^2}-x\frac{dy}{dx}+y=\log x$

9. a) Using Laplace transform, solve $\left(D^2+2D-3\right)y=\sin x, y(0)=y'(0)=0$

   b) Using Laplace transform evaluate $\int_0^\infty \frac{e^{-t}-e^{-2t}}{t}dt$ **[7+3]**

OR

10. Solve $(D^3-2D^2+5D)y=0$ where $D=\frac{d}{dt}$ by Laplace techniques.

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

Subject: **Engineering Physics**

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

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

PART – A

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

1. What is Interference? What are the conditions to get interference in light?
2. Define Simple Harmonic Motion
3. Define space lattice.
4. Write any two properties of wave function?
5. Explain the significance of surface to volume ratio of nanoparticles.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. a) What is diffraction grating? **(2+8)**
   b) Explain the theory of plane diffraction grating and derive equation for maxima and minima.

OR

2. a) Obtain conditions for maxima and minima due to interference of reflected light in thin film of uniform thickness. **(7)**
   b) State the factors on which the resolving power of grating depends. **(3)**
3. a) What are the characteristics of SHM
   b) Obtain the differential equation for a simple harmonic oscillator and derive the expression for total energy of the oscillator. **(2+8)**

OR

4. a) Find the solution for the differential equation of a damped harmonic oscillator. **(7)**
   b) Explain the behavior of damped harmonic oscillator using its solution (under damp ,critical damp and over damp) **(3)**
5. a) State and explain Bragg's law of diffraction.
   b) Describe the powder method of X-ray diffraction. **(3+7)**

OR

6. a) Define Miller indices. Determine Miller indices for a plane making 2a, 4b, 3c intercepts on the crystallographic axes. **[4]**
   b) Show that FCC is closely packed over SC and BCC crystal structures **(6)**
7. a)An electron is trapped in a one dimensional box of 0.1 nm length .calculate the energy required to excite it from its ground state to fifth excited state **(3)**
   b) Write the Schrodinger equation for a particle in a box and solve it to obtain the Eigen values and Eigen functions. **(7)**

OR

8. a) Write the mathematical characteristics of wave function. **(4)**
   b) Show that the energy is quantized for a particle confined in 1-D box **(6)**
9. a) What are single - walled and multi walled carbon nano tubes? **(2)**
   b) Explain the various steps that are involved in synthesizing nano materials by SOL-GEL method with a neat sketch. **(8)**

OR

10. a) Describe CVD (Chemical vapor deposition) technique for the synthesis of nanometerials **(4)**
    b) Explain any technique for the synthesis of nanomaterial **(6)**

Code No.: **70B10** **MR17**

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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. How do regenerate ion exchange resins.
2. Differentiate between specific and equivalent conductance. Write the units.
3. Why is Teflon highly chemical resistant?
4. Why natural gas is called fossil fuel?
5. What are composites?

PART-B

Answer **ALL** qucstions of the following **5x10 Marks= 50Marks**

1. a) Calculate the amount of lime and soda required per litre for the chemical treatment of water containing: Ca^{2+} = 80 ppm; Mg^{2+} = 36 ppm; K^{+} = 39 ppm; HCO_3^- = 244 ppm; $FeSO_4$, $7H_2O$ added as coagulant = 69.5 ppm.
   b) How can scale formation be prevented by?
   i) Phosphate conditioning and
   ii) Calgon conditioning.

OR

2. What is hardness of water? How do you express hardness? Give its various units & their inter conversions.
3. a) Explain the construction & working of calomel electrode.
   b) Write the differences between primary and secondary cells.

OR

4. a. Define a battery. Write the discharging and recharging cell reactions of Lead - Acid battery.
   b. What is Single Electrode Potential? Derive the Nernst equation.
5. a) Differentiate Addition & Condensation polymerization with examples.
   b) Explain free radial polymerization mechanism of addition polymer.

OR

6. What is elastomer? Give the preparation and applications (any3) of (a) Buna – S rubber (b) Butyl rubber.
7. a) Define cracking. How is it useful?
   b) Explain fixed bed catalytic cracking with neat diagram.

OR

8. What are Renewable Energy Resources? Mention the advantages and applications of a)Solar Energy (b) Wind Energy.
9. a) Write the applications of nanometerials.
   b) Write short notes on: i)Biodiesel ii) Bioethanol.

OR

10. a) Write the important types of composites.
    b) Give a short note on Nano composites.i) Bio-sensors ii) Bio-surfactants