

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

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

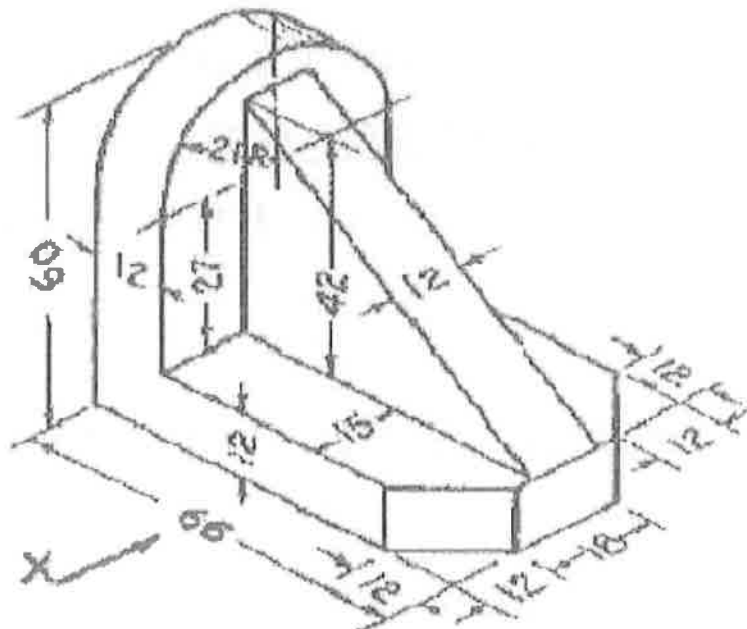
Subject: **Engineering Drawing-I**

Branch: **Common to CE, ME, ECE, EEE, CSE & MINING****Time: 3 hours****Max. Marks: 75**

Answer **ALL** questions

**5x15Marks=75Marks**

1. Construct a vernier scale of R.F. =  $1/80$  to read inches and to measure upto 15 yards.  
**OR**
2. a) Construct a Scale, to measure km,  $1/8$  of KM and  $1/40$  of a KM, in which 1 KM is represented by 4 cm. Mark a distance of 2.77KM on this scale.  
b) Show by means of a drawing that a Hypocycloid is a straight line, if the diameter of the directions circle is twice that of the diameter of the generating circle. **[6+9M]**
3. The front view of a line AB 90mm long is inclined at  $45^\circ$  to XY line. The front view measures 65mm long. Point A is located 15mm above HP and is in VP. Draw the projections and find its true inclinations. Also locate its traces  
**OR**
4. A line AB of 100mm long is inclined at  $45^\circ$  to HP and  $30^\circ$  to V.P. Its end 'A' is 30mm above the HP and 20mm behind the V.P. Where as the other end 'B' is in the fourth quadrant. Draw the Projections of the line and locate its traces.
5. A rectangular plate of size 70mmX40mm rests on its shorter side in the V.P.& the surface is inclined at  $45^\circ$  with the V.P. the longer side of the plane is inclined at  $30^\circ$  to the H.P. Draw its projections.  
**OR**
6. A hexagonal lamina of side 30mm rests on one of its edges on HP. This edge is parallel to VP. The surface of the lamina is inclined  $60^\circ$  to HP. Draw its projections.
7. A square pyramid, base 40 mm side and axis 90 mm long, has a triangular face on the ground and the vertical plane containing the axis makes an angle of  $45^\circ$  with the VP. Draw its projections.  
**OR**
8. A Cone of base 50mm diameter and axis 80mm long, has one of its generators on V.P and inclined at  $30^\circ$  to H.P Draw its Projections.
9. Draw isometric projection of a frustum of a sphere with a 60mm diameter, frustum circle with a 40mm diameter, resting centrally on a cube with a 50mm side such that the circle of a frustum is horizontal and do not touch the cube.  
**OR**
10. Draw the front, top and both side views of the given block. All dimensions are in mm.





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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Computer ProgrammingBranch: **Common to CE, ME, ECE, EEE, CSE & MINING****Time: 3 hours****Max. Marks: 75****PART – A****I.** Answer **ALL** questions of the following**5x1Mark=5 Marks**

1. What is an algorithm?
2. List any four string handling functions.
3. Give the difference between structure and union.
4. What is the use of pointer?
5. Give an example of open source software

**II.** Answer **ALL** questions of the following**10x2Marks=20 Marks**

1. Define flow chart. Why is flow chart required?
2. List the various input and output statements in C.
3. Give an example for initialization of string array.
4. How is a character string declared?
5. Differentiate between actual parameter and formal parameter.
6. What do you mean by nested structure and give an example.
7. What is the use of pre-processor directives?
8. Write any two pre-processor directives in C.
9. What are the advantages of open source software?
10. Write any two features of PHP.

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

1. a) Explain the different types of operators available in C.  
b) Discuss the basic data types in C.

**[5M+5M]****OR**

2. a) Explain the various generations of computers.  
b) Define software. Explain in detail about steps involved in software development.
3. Describe the various looping statements used in C with suitable examples.

**[5M+5M]****[10M]****OR**

4. Explain the various string operations. write a C program to find out the length of the string without using the builtin function.
5. a) What is recursion? Explain a recursion function with suitable example.  
b) Explain various storage classes in C.

**[10M]****[5M+5M]****OR**

6. a) Explain the concept of call by reference with suitable example.  
b) What is union? Discuss with an example.
7. a) Write a C program to swap the content of two variables using pointers.  
b) Explain command line arguments with suitable example.

**[5M+5M]****[5M+5M]****OR**

8. Define file? Explain various file handling mechanisms with examples.
9. Develop a sample website for library using PHP.

**[10M]****[10M]****OR**

10. What is shell in Linux? Write a Shell script to find factorial of a given integer.

**[10M]**



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

Time: 3 hours

Max. Marks: 75

**PART – A****I.** Answer **ALL** questions of the following**5x1Mark=5 Marks**

1. Why do we add buffer solution during titration of hard water against EDTA solution?
2. Write the cell reaction for Caustic embrittlement?
3. What are the units of Corrosion?
4. What is the effect of temperature on molar conductivity?
5. What are the advantages of electroless plating?

**II.** Answer **ALL** questions of the following**10x2Marks=20 Marks**

1. What are the units of hardness and write their relationship?
2. Describe Caustic embrittlement. Write the cell reaction involved in it.
3. What is the principle involved in reverse osmosis?
4. What are the parameters of potable water?
5. Differentiate galvanic series and electrochemical series.
6. Define specific resistance of a solution. Mention its units.
7. Explain why the rate of corrosion accelerates with reduction in the over voltage of hydrogen of the Corroding metal.
8. How rate of corrosion will change with acidic environment and temperature.
9. What is the mechanism of thin film lubrication?
10. What is the role of Nano material in the drug delivery?

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

1. a) What is the Principle of EDTA Titrations? How can the Permanent hardness of water be determined by this method?  
b) A Standard hard water contains 15g of  $\text{CaCO}_3$  per liter. 20ml of this required 25ml of EDTA solution. 100ml of sample water required 18ml EDTA solution. The same sample after boiling required 12ml EDTA solution. Calculate temporary hardness in terms of ppm.  
(OR)
2. a) Describe scale & sludge formation in boiler.  
b) What is the Principle involved in internal treatment of boiler feed water ? Discuss any two methods.
3. a) Explain the Principle behind the calculation of lime soda process and write the necessary equations  
b) What is sterilization of water? Name three substances for sterilization of water and explain.  
(OR)
4. a) Describe in detail the ion exchange process for softening of hard water.  
b) What are the advantages of breakpoint chlorination? Also give the necessary graph.
5. a) What are the fuel cells? Write about hydrogen oxygen fuel cell and its applications.  
b) What are the types of electrodes? Write the construction and working of glass electrode?  
(OR)
6. a) Explain the classification of batteries & discuss lead acid cell. How does it works at the time of charging & discharging.  
b) What is Quinhydrone electrode? Explain
7. a) What is the Principle of corrosion? Explain the electrochemical Corrosion by taking rusting of iron as example  
b) What are the environmental factors affecting the rate of corrosion.  
(OR)
8. a) Explain the electro plating and electroless plating with examples.  
b) What is Cathodic protection? Explain the sacrificial anodic protection.
9. a) What are Nano materials? Write the preparation of nano materials by Chemical vapour deposition method.  
b) What are lubricants? How to find the viscosity of a lubricating oil?  
(OR)
10. a) What is Refractory? Write the characteristics and applications of refractory materials.  
b) What are characteristics of a good lubricant?



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- 1) Find the interval in which 'b' should lie so that both the Eigen values of the matrix  $\begin{bmatrix} -1 & 3 \\ b & -2 \end{bmatrix}$  are negative.
- 2) If sum of Eigen values of a skew-symmetric matrix is  $A+iB$ , then write the possible value of 'A'. Write the reason to support your answer.
- 3) Is a set of 3 dimensional vectors, including (0, 0, 0) linearly independent?
- 4) Does any unitary matrix have  $1+i$  as its one Eigen value? Explain
- 5) Is the differential equation  $\frac{dy}{dx} = \frac{1}{3x+4y-7}$  linear or non-linear?

**II Answer all questions**  
marks**10X2=20**

- 1) Write the wronskian  $W(f,g,h)$  of the functions  $f(x)=x$ ,  $g(x)=\sin x$ ,  $h(x)=\cos x$ .
- 2) Find the two linearly independent solutions of  $y''+5y'+6y=0$
- 3) Find the particular integral of  $y''+y=\sin x$
- 4) Find the Laplace transform of  $\frac{f(x)}{x}$ , if  $F(s)$  is  $L(f(x))$ .
- 5) Define Newton's law of cooling.
- 6) Find the orthogonal trajectories of  $\frac{dy}{dx} = \frac{x}{y}$
- 7) On the Argand diagram where do the Eigenvalues of a Hermitian matrix lie?
- 8) Define Nature and index of the quadratic form.
- 9) Find the inverse laplace transform of  $e^{-2s} \int_s^\infty \frac{s}{s^2+4} ds$
- 10) Solve the equations  $x+y=3$ ;  $x+2y=4$  using LU decomposition method.

**Part-B****5X10=50marks****Answer all questions**

- 1) (a) Find the rank of the matrix  $A = \begin{bmatrix} 2 & -2 & 0 & 6 \\ 4 & 2 & 0 & 2 \\ 1 & -1 & 0 & 3 \\ 1 & -2 & 1 & 2 \end{bmatrix}$  by reducing it into normal form.

b) Show that the equations given below are consistent and solve them by using LU decomposition method  $x-3y-8z = -10$ ,  $3x+y-4z = 0$ ,  $2x+5y+6z = 13$ .

OR

- 2) (a) By **Gauss Elimination Method**, solve the simultaneous equations  $x+2y+z=8$ ;  $2x+3y+4z=20$ ;  $4x+3y+2z=16$

- (b) Find the rank of a matrix by reducing it to normal form  $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$

3) (a) Find the Eigen values and Eigen Vectors of  $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$

(b) Show that all the characteristic roots of a Hermitian matrix are real

OR

4) (a) If  $\lambda$  is an Eigen value of an orthogonal matrix A, Then  $\frac{1}{\lambda}$  is also Eigen value of A.

(b) State Cayley-Hamilton theorem and verify with the matrix  $= \begin{bmatrix} 3 & 1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$  and find  $A^{-1}$ .

5) (a) Reduce the quadratic form  $3x_1^2 + 3x_2^2 + 3x_3^2 + 2x_1x_2 + 2x_1x_3 - 2x_2x_3$  to canonical form by orthogonal transformation. Find rank, index and signature of the quadratic form.

(b) Bacteria in a culture grow exponentially so that the initial number has doubled in 3 hours. How many times the initial number will be present after 9 hours.

OR

6) (a) Reduce the quadratic form  $3x^2 + 5y^2 + 3z^2 - 2yz + 2zx - 2xy$  to the canonical form and specify the matrix of transformation

(b) A body kept in air with temperature  $25^\circ C$ , cools from  $140^\circ C$  to  $80^\circ C$  in 20 minutes. Find when the body cools down to  $35^\circ C$ .

7) (a) Solve the Differential Equation  $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{-x} + x^2 + \cos x$ .

(b) Solve  $(D^2 + 1)y = \sec x \tan x$  by Variations of parameters method

OR

8) (a) Solve  $(D^4 + D^2 + 1)y = e^{-x} \sin 2x$

(b) By variation of parameters, solve  $(D^2 + 1)y = \tan x$

9) (a) Find the Inverse Laplace transform of  $\frac{s}{(s+1)^2(s^2+1)}$  using Convolution theorem

(b) By the method of Laplace transforms, Solve the differential equation  $(D^2 + 1)x = t \cos 2t$ , with the conditions  $x = Dx = 0$  at  $t = 0$

OR

10) (a) Find the Laplace transform of  $\sin t$  and hence find the Laplace transform of  $\cos t$

(b) Solve the differential equation by Laplace transform technique

$$\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 5y = e^{-x} \sin x; y(0) = 0; y'(0) = 1$$



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**I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Engineering Physics-IBranch: **Common to CE, ME, MINING, EEE, ECE & CSE****Time: 3 hours****Max. Marks: 75****PART – A****I. Answer ALL questions of the following****5x1Mark=5 Marks**

1. What are the lattice parameters?
2. State the characteristics of S.H.M
3. What are the difference between dielectrics and insulators?
4. Mention two applications of pn junction diode.
5. Define electromagnetic field

**II. Answer ALL questions of the following****10x2Marks=20 Marks**

1. What is Burger's vector? Explain it.
2. What are positive and negative Edge dislocations?
3. The maximum velocity of a body in SHM is 100 m/s while the maximum acceleration is  $1.57 \text{ m/s}^2$ . Calculate the time period of a body.
4. Explain the terms the resonance and sharpness of resonance?
5. Distinguish between insulator, semiconductor and conductor on the basis of band theory of solids.
6. What is the difference between matter wave and electro magnetic wave.
7. Draw the energy band diagram of (i) An intrinsic (ii) n-type and (iii) p-type semiconductor include Fermi, donor and acceptor levels, wherever present.
8. Describe the operation of p-n junction diode in forward bias.
9. State Ampere's circuital law.
10. Give the physical interpretation of grad V.

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

1. a) Explain the concept of Miller indices. How they are calculated?

b) State their important features.

c) Draw the planes (2 0 1) &amp; (1 1 2)

**[4+2+4M]****OR**

2. a) Calculate the equilibrium number of vacancies per unit volume at a temperature of  $1000^\circ\text{C}$ , the energy for the formation of vacancy in copper is  $0.90\text{eV}$ . What is the vacancy fraction at  $500^\circ\text{C}$ .?

b) Explain the significance of Burger's vector.

3. a) Derive the differential equation of damped harmonic oscillator and solve it.

**[6M]**

b) Discuss the motion of damped harmonic oscillator under critically damping conditions.

**[4M]****OR**

4. a) Write briefly on forced oscillations.

b) Give the analogy of electrical oscillator.

5. a) Write the salient features of classical free electron theory of metals.  
b) Describe the formation of energy bands in a crystalline solid.

**OR**

6. a) Explain physical significance of wave function? [4]  
b) Derive Schrodinger's time independent wave equation? [6]
7. a) What is Hall effect? [2]  
b) Give an elementary theory of Hall effect. Write few applications of it. [8]

**OR**

8. a) Draw the energy band diagram of P-N junction diode and explain the working of diode? [6]  
b) Explain the concept of Fermi level in intrinsic and extrinsic semiconductors. [4]
9. a) Explain the concept of displacement current.  
b) And show it led to the modification of Ampere's law.

**OR**

10. Describe the Maxwell equations of differential and integral forms.