

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

		Marks	CO	Blooms Level
1.	a	5	1	2
	b	5	1	2
(OR)				
2.	a	6	1	2
	b	4	1	3

**UNIT-II**

		Marks	CO	Blooms Level
3.	a	5	2	2
	b	5	2	3
(OR)				
4.	a	5	2	2
	b	5	2	3

**UNIT-III**

		Marks	CO	Blooms Level
5.	a	5	3	2
	b	5	3	2
(OR)				
6.	a	5	3	2
	b	5	3	2

**UNIT-IV**

		Marks	CO	Blooms Level
7.	a	5	4	2
	b	5	4	2
(OR)				
8.	a	5	4	1
	b	5	4	3

**UNIT-V**

		Marks	CO	Blooms Level
9.	a	5	5	2
	b	5	5	2
(OR)				
10.	a	5	5	2
	b	5	5	2

**UNIT-VI**

		Marks	CO	Blooms Level
11.	a	5	6	2
	b	5	6	2
(OR)				
12.	a	5	6	1
	b	5	6	3

**PULSE AND DIGITAL CIRCUITS  
(Electronics and Communication Engineering)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

<u><b>UNIT-I</b></u>		Marks	CO	Blooms Level
1.	a What is Low Pass Filter? Prove that a low pass circuit acts as an integrator.	5	1	2
	b The limited ramp is applied to a RC differentiator circuit. Draw the Waveforms for the case, i) $T=RC$ and ii) $T=5RC$ .	5	1	3
<b>(OR)</b>				
2.	a An RC low-pass filter is fed with a symmetrical square wave. The peak-to-peak amplitude of the input waveform is 10 V and its average value is zero. It is given that $RC=T/2$ where T is the period of the square wave. Determine the peak-to-peak amplitude of the output waveform.	5	1	3
	b Explain the response of RC High Pass circuit for the following input waveforms A) Step B) Pulse.	5	1	2
<u><b>UNIT-II</b></u>		Marks	CO	Blooms Level
3.	Describe what is clamping operation? State and prove the clamping circuit theorem?	10	2	4
<b>(OR)</b>				
4.	a Illustrate the basic circuit diagram of positive clamper and negative clamper circuits and explain its operation using waveforms?	5	2	4
	b With the help of a neat circuit diagram, demonstrate the working of a two-level clipper?	5	2	2
<u><b>UNIT-III</b></u>		Marks	CO	Blooms Level
5.	a Discuss how a Transistor acts as a switch.	5	3	2
	b With suitable diagram explain the function of a basic bistable multivibrator?	5	4	2
<b>(OR)</b>				
6.	a Explain the switching characteristics of Transistor?	5	3	2
	b What is the significance of triggering a binary? List various types of triggering methods.	5	4	2
<u><b>UNIT-IV</b></u>		Marks	CO	Blooms Level
7.	Describe a monostable multivibrator and draw the neat diagram with suitable waveforms and explain operation of the collector coupled monostable multivibrator	10	4	4
<b>(OR)</b>				
8.	Design the Astable Multivibrator to generate 1 KHz square wave. The supply voltage $V_{CC}=10V$ , $I_{C(sat)}=10mA$ , $h_{FE}=50$ and assume Si transistors.	10	4	3

<b><u>UNIT-V</u></b>			Marks	CO	Blooms Level
9.	a	Demonstrate how UJT is used as relaxation oscillator?	5	5	4
	b	Compare miller and bootstrap time-base generators	5	5	2
<b>(OR)</b>					
10.	a	Explain the principle of boot strap time base generator	5	5	2
	b	Brief out the functionality of transistorized miller time base generator with neat circuit diagram.	5	5	2

<b><u>UNIT-VI</u></b>			Marks	CO	Blooms Level
11.	a	With the help of a neat diagram, explain the working of a bidirectional gates using transistors?	5	6	2
	b	State the two basic types of sampling gates and explain them	5	6	2
<b>(OR)</b>					
12.	a	Explain about four diode sampling gate.	5	6	2
	b	Draw the circuit diagram of a unidirectional sampling gate which delivers an output only at the coincidence of a number of control voltages and explain its working.	5	6	2

Time: 3 Hours

Max Marks: 60

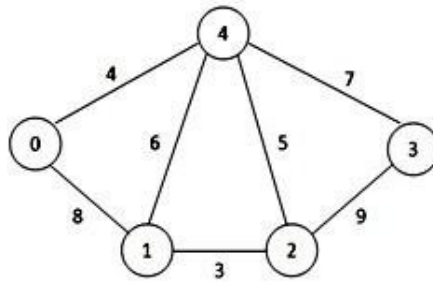
Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

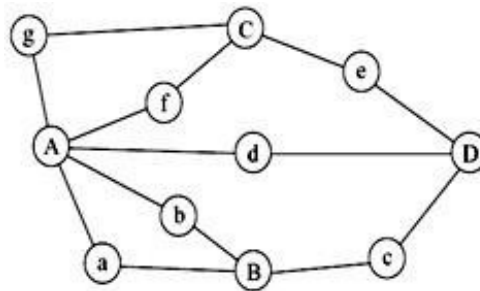
<u>UNIT-I</u>			Marks	CO	Blooms Level
1.	a	Describe the role of space complexity and time complexity of an Algorithm.	5	CO1	K1
	b	Solve the following recurrence relation $T(n)=2 T(n/2) + 1$ , and $T(1)=2$	5	CO1	K3
(OR)					
2.	a	List out various basic characteristics of an algorithm.	5	CO1	K1
	b	Describe amortized analysis and Examine how amortized complexity, actual complexity related.	5	CO1	K2
<u>UNIT-II</u>			Marks	CO	Blooms Level
3.	a	Demonstrate Divide and Conquer technique through binary search algorithm and analyze its time complexity for all three cases.	5	CO2	K2
	b	Construct the Merge sort algorithm for the list of numbers: 78, 32, 42, 62, 98, 12, 34, 83.	5	CO2	K3
(OR)					
4.	a	Demonstrate Randomized algorithm. Describe the procedure to analyze Randomized algorithms.	5	CO2	K2
	b	Examine when Strassen's method outperforms the traditional matrix multiplication method. How many numbers of multiplication operations are required during multiplication of two matrices with size of $8 \times 8$ in Strassen's method?	5	CO2	K3
<u>UNIT-III</u>			Marks	CO	Blooms Level
5.	a	Describe the greedy method for generating the shortest paths	5	CO3	K1
	b	Distinguish between greedy method from dynamic programming	5	CO1	K2
(OR)					
6.	a	With the algorithm, describe job sequencing with deadlines problem.	5	CO1	K2
	b	Prove that Prim's method generates minimum-cost spanning tree.	5	CO3	K3
<u>UNIT-IV</u>			Marks	CO	Blooms Level
7.	a	State the time complexity of all pairs shortest paths problem	5	CO4	K1
	b	Solve the solution for 0/1 knapsack problem using dynamic programming $N=3$ , $m=6$ profits $(p_1, p_2, p_3) = (1, 2, 5)$ weights $(w_1, w_2, w_3) = (2, 3, 4)$	5	CO4	K3
(OR)					

- |    |   |  |   |     |    |
|----|---|--|---|-----|----|
| 8. | a | Illustrate Informal knapsack algorithm by using dynamic Programming    | 5 | CO4 | K2 |
|    | b | Calculate shortest distance by using all pairs shortest path algorithm | 5 | CO4 | K3 |



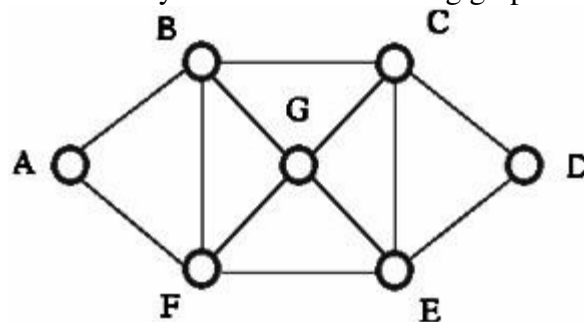
### UNIT-V

- |    |   |   |   |     |    |
|----|---|---|---|-----|----|
| 9. | a | Compare the approaches of BFS and DFS methods and derive the time complexities of both methods for the inputs of adjacency lists and adjacency matrix separately. | 5 | CO5 | K2 |
|    | b | Illustrate DFS and BFS traversals of following graph  | 5 | CO5 | K3 |



(OR)

- |     |   |  |   |     |    |
|-----|---|--|---|-----|----|
| 10. | a | Explain subset-sum problem and discuss the possible solution strategies using backtracking | 5 | CO5 | K2 |
|     | b | Identify Hamiltonian cycle from the following graph  | 5 | CO5 | K3 |



### UNIT-VI

- |      |   |   |   |     |    |
|------|---|---|---|-----|----|
| 11.  | a | Explain TSP using branch and bound method with example  | 5 | CO6 | K2 |
|      | b | Draw the portion of state space tree generated by LCBP by the following knapsack problem $n=5$ , $(p_1, p_2, p_3, p_4, p_5) = (10, 15, 6, 8, 4)$ , $(w_1, w_2, w_3, w_4, w_5) = (4, 6, 3, 4, 2)$ and $m=12$ | 5 | CO6 | K3 |
| (OR) |   |   |   |     |    |
| 12.  | a | Explain 3CNF satisfiability problem   | 5 | CO6 | K2 |
|      | b | Show that satisfiability is at most three literals reduces to chromatic number  | 5 | CO6 | K3 |

# AR18

**CODE: 18CET206**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**II B. Tech II Semester Supplementary Examinations, September, 2022**

**ENGINEERING GEOLOGY  
(Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## **UNIT-I**

1. a) What is geology? Describe the importance of geology in civil engineering? 6M  
b) How are rivers formed? List out some rivers and their geological features in India? 6M  
(OR)
2. a) Classify the methods of study of minerals? 6M  
b) What are the various modes of formation of minerals? 6M

## **UNIT-II**

3. a) What is the difference between dykes and sills? 6M  
b) What are the types of granite? State the physical properties of granite 6M  
(OR)
4. a) What is dolerite? Enlist the minerals present in dolerite. What are the uses of dolerite? 6M  
b) Explain the characteristics of metamorphic rocks? 6M

## **UNIT-III**

5. a) Distinguish between unconformities and joints with suitable examples. 6M  
b) Define structural geology. What are the factors that affect deformations in the rock? 6M  
(OR)
6. a) Write a short note on effects of folds and faults in civil engineering point of view. 6M  
b) Explain with neat sketches different faults that occur in the rock mass. 6M

## **UNIT-IV**

7. a) Explain cone of depression with neat sketch. 6M  
b) Briefly explain causes and effects of Earth Quakes. 6M  
(OR)
8. a) Describe the geological controls of Ground water? 6M  
b) Write the importance of Electrical resistivity methods and seismic refraction methods 6M

## **UNIT-V**

9. a) Discuss how life of reservoir is based on siltation rate. 6M  
b) What is the purpose of tunnelling? How the tunnels are classified. 6M  
(OR)
10. a) Discuss geological considerations for effective tunnelling. 6M  
b) Discuss different parts of dam with neat sketch. 6M

# AR18

**CODE: 18BST209**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**II B. Tech II Semester Supplementary Examinations, September, 2022**

## **BIOLOGY**

**(Common to EEE & ME)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

### **UNIT-I**

1. a) Write the fundamental differences between science and Engineering using live examples (6M)
- b) Explain exciting and contemporary aspects of Biology as an independent scientific discipline. (6M)

**(OR)**

2. a) Discuss the major discoveries of Biology in recent past and explain them. (6M)
- b) Analyse the Brownian motion with the help of Thermodynamics with suitable examples. (6M)

### **UNIT-II**

3. a) Explain the ultra-structure of Prokaryotes and Eukaryotes. (6M)
- b) Describe Sterilization and growth kinetics in brief with suitable examples (6M)

**(OR)**

4. a) Explain Molecular Taxonomy along with three major kingdoms of life. (6M)
- b) Give a detailed explanation of the concept of Species and Strains (6M)

### **UNIT-III**

5. a) Describe Mendel's locus concept of Segregation and Independent Assortment. (6M)
- b) Discuss the single-gene disorders in humans. (6M)

**(OR)**

6. a) Explain the concept of Genetic code and Genetic Recombination (6M)
- b) Give a brief account of the hierarchy of DNA structure. (6M)

### **UNIT-IV**

7. a) Write about the enzyme classification and its general properties. (6M)
- b) Describe the mechanism of enzyme action with examples. (6M)

**(OR)**

8. a) Write a brief account of the hierarchy of protein structure and its types (6M)
- b) Functions of Protein and Kinetic parameters (6M)

### **UNIT-V**

9. a) Write a brief account of Thermodynamics as applied to biological systems. (6M)
- b) Explain energy-yielding and energy-consuming reactions (6M)

**(OR)**

10. a) Explain Endothermic and Exothermic reactions. (6M)
- b) Explain the systems of glucose from CO<sub>2</sub> and H<sub>2</sub>O (photosynthesis) (6M)

**PULSE AND DIGITAL CIRCUITS  
(Electronics and Communication Engineering)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

1. a) Obtain the response of an RC low-pass circuit to a square wave input for long, medium and short time constants. 6M  
b) Explain the operation of attenuators. 6M

**(OR)**

2. a) Explain about RLC ringing circuit? 6M  
b) Calculate the lowest square wave frequency that can be passed by an amplifier with a lower 3-db frequency of 5 Hz. If the maximum allowable tilt in the Output is 2%. 6M

**UNIT-II**

3. a) Give the circuits of any two types of shunt clippers and explain their operation with the help of their transfer characteristics 6M  
b) State and prove clamping circuit theorem. 6M

**(OR)**

4. a) Draw the circuit diagram and explain the working of transistor clippers. 6M  
b) Draw the basic circuit diagram of negative peak clamper circuit and explain its operation 6M

**UNIT-III**

5. a) Explain how transistor acts as switch. Draw base and collector waveforms and indicate all the time intervals. 8M  
b) Explain the method of unsymmetrical triggering of the binary with relevant circuit diagram. 4M

**(OR)**

6. a) Explain the following i) Collector Catching Diodes ii) Commutating Capacitors 6M  
b) Explain applications of Schmitt trigger. 6M

**UNIT-IV**

7. a) Explain how astable multivibrator is used as a voltage to frequency convertor. 6M  
b) Draw the circuit diagram of astable multivibrator and explain its operation. 6M

**(OR)**

8. A collector coupled monostable multivibrator using n-p-n silicon transistors has the following parameters:  $V_{CC} = 12V$ ,  $V_{BB} = 3V$ ,  $R_C = 2k\Omega$ ,  $R_1 = R_2 = R = 20k\Omega$ ,  $h_{FE} = 30$ ,  $r_{bb} = 200\Omega$ , and  $C = 1000\text{ PF}$ . Neglect  $I_{CBO}$ . Calculate and plot to scale the wave shapes at each base and collector. Find the width of the output pulse. 12M

**UNIT-V**

9. a) What are the different methods of generating time-base waveforms? Explain about each briefly. 4M  
b) Explain the working of Transistor Miller sweep circuit. What are its advantages over Bootstrap sweep circuits? 8M

**(OR)**

10. a) Explain how the loading of the control signal is reduced when the number of inputs increases in a sampling gate. 6M  
b) Explain the function of a sampling gate used in Sampling Scopes also explain how sampling gate is used in chopping amplifiers. 6M



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

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

1. a) Describe the basic operational connection between the processor and memory with a neat structure diagram. 6M  
b) What is an instruction cycle? Briefly explain with the help of state diagram. 6M  
(OR)
2. a) How do we classify CPU's based on their register organizations? In which Organizations zero address instructions are used? Mention few zero address Instructions And their actual execution in practice? 6M  
b) List the characteristics of RISC and CISC 6M

**UNIT-II**

3. a) Design 4-bit adder/Subtractor and explain its function. 6M  
b) Discuss about fixed point and floating point representations. 6M  
(OR)
4. Explain the basis of Booth's Multiplication algorithm and Multiply 7 with 3 using booth's algorithm sequential steps. 12M

**UNIT-III**

5. a) Differentiate between write through and write back cache policies. 6M  
b) Explain about various page replacement algorithms. 6M  
(OR)
6. a) What is a mapping function? What are the various cache a mapping techniques? 6M  
b) Explain about memory hierarchy in terms of speed, cost and size. 6M

**UNIT-IV**

7. How the data transfer to and from peripherals is done? Discuss with neat diagrams and examples. 12M  
(OR)
8. a) Explain the following with respect to asynchronous data transfer. 6M  
i) Strobe control ii) Hand shaking .  
b) Compare synchronous and Asynchronous serial data transmission. 6M

**UNIT-V**

9. What are different physical forms available to establish an inter connection network? Explain with neat sketch 12M  
(OR)
10. a) What are the various pipeline hazards? Explain. 6M  
b) What is the purpose of system bus controller? Explain how the system can be designed to distinguish between reference to local memory and references to common shared memory 6M

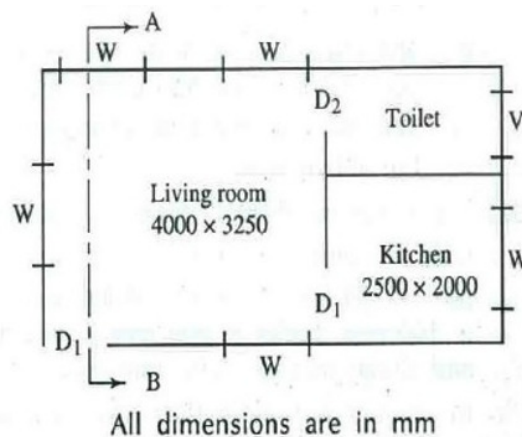
**PART-A****Answer any Three questions from Part-A**

1. a) List out the various classification of buildings. Briefly explain classification of buildings according to financial group, occupancy, and built-in environment. [10M]  
b) Are building bye-laws applicable to a building whose occupancy is changed? Explain. [4M]
2. Give the recommended sizes of (i) Store room, (ii) Pooja room, (iii) Stairs and (iv) Verandah in a typical residential building. Also, explain their purpose and requirements. [14M]
3. a) Explain the importance of orientation in buildings. What measures are suggested for orientation of buildings with respect to sunlight? [10M]  
b) In hot climates, habitable rooms on the South and West sides should be protected by verandah, balcony, bathroom, store room. Explain why? [4M]
4. a) What is the sun path diagram? Explain its importance in building planning [7M]  
b) Why is it suggested to orient the longer side of the building towards North-South rather than East-West? Explain with a neat sketch. [7M]
5. a) Define the term Floor Space Index (F.S.I.) with an example. Explain its importance in the planning of a city. [8M]  
b) For an F.S.I. of 0.3, 0.6, and 0.9, calculate the total permissible built-up area (in all floors) if the site area is 3,000 sq.m. [6M]

**PART-B****Answer any One question from Part-B**

6. a) Draw the standard sign conventions (i) Plaster, (ii) Steel, (iii) Timber, (iv) Sand, and (v) Brickwork [10M]  
b) Draw sketches for one and 2 brick thick wall in Flemish bond. [18M]
7. The line diagram of a residential building is shown in the figure below. Draw the plan, elevation, and section along A-B using the following specifications [28M]

D1 – Panelled door – 900 mm x 2100 mm  
D2 – Panelled door – 750 mm x 1800 mm  
W – Glazed window – 1200 mm x 1400 mm  
V – Ventilator – 750 mm x 450 mm  
Sunshade projects 500 mm beyond the wall face.  
Assume any data necessary



**Time: 3 Hours****Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

1. a) State Coulomb's Law and Derive an expression for the Electric Field Intensity at any point due to an infinite sheet of charge where charge density is  $\rho_s \text{ C/m}^2$ . 10 M

- b) Explain the relationship between the Cartesian and Spherical systems. 4 M

**(OR)**

2. a) Derive the expression for Energy stored in Electrostatic fields. 8 M

- b) Show that the divergence of flux density due to point charge is zero with necessary expressions. 6 M

**UNIT-II**

3. Derive the relations between the normal components and tangential components of the electric field at a dielectric – dielectric boundary. 14 M

**(OR)**

4. a) Determine the capacitance of Spherical Capacitor if 'a' and 'b' are inner and outer sphere radii. 7 M

- b) A parallel plate capacitor has a plate area of  $1.5 \text{ m}^2$  and a plate separation of 5 mm. There are two dielectrics in between the plates. The first dielectric has a thickness of 3 mm with a relative permittivity of 6 and the second has a thickness of 2 mm with a relative permittivity of 4. Find the Capacitance. 7 M

**UNIT-III**

5. A wire of length L is formed into (i) Circle (ii) Equilateral triangle and (iii) Square. For the same current I, find the magnetic field **H** at the centre of each. 14 M

**(OR)**

6. a) Using Ampere's circuital law, obtain the expression for the magnetic field **H** at any point due to Co-axial Cable. 10 M

- b) Find the flux passing the portion of the plane  $\phi = \pi/4$  defined by  $0.01 < r < 0.05 \text{ m}$  and  $0 < z < 2 \text{ m}$ . A current filament of 2.5 A is along the z-axis in the  $\mathbf{a}_z$  direction, in free space. 4 M

**UNIT-IV**

7. a) Explain Lorentz force equation and derive the expression for force between two differential current elements in Magnetic field. 8 M

- b) A coil of 500 turns is wound on a closed iron toroidal ring of mean radius 10 cm and cross section area of  $3 \text{ cm}^2$ . Find the Self-inductance of the winding if the relative permeability of iron is 800. 6 M

**(OR)**

8. a) Derive an expression to calculate the inductance of a long solenoid. 7 M

- b) Determine the maximum torque on a square loop of 1000 turns in a field of uniform flux density 1 Tesla. The loop has 10 cm side and carries a current of 3 A. Also calculate the Magnetic Moment of the loop. 7 M

**UNIT-V**

9. a) Express the Maxwell's equation in differential and integral forms in Electro-magnetic fields. 8 M

- b) State and explain Faraday's law of Electromagnetic induction. 6 M

**(OR)**

10. State and derive Poynting Theorem and Poynting Vector. 14 M

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

### UNIT-I

1. a) State and prove Baye's theorem. [7M]
- b) What is the probability of drawing 3 white and 4 green balls from a bag that contains 5 white and 6 green balls, if 7 balls are drawn simultaneously at random? [7M]

**(OR)**

2. a) Give the classical definition of probability. [7M]
- b) When two dice are thrown, determine the probabilities for the following three events [7M]  
(i)  $A = \{\text{Sum} = 7\}$  (ii)  $B = \{8 < \text{Sum less than or equal to } 11\}$  (iii)  $C = \{10 < \text{Sum}\}$

### UNIT-II

3. a) What is a random variable? What are the conditions for a function to be a random variable [7M]
- b) In experiment where the pointer on a wheel of chance is spun. The possible outcomes are the number from 0 to 12 marked on the wheel. The sample space consists of the numbers in the set  $\{0 \leq S \leq 12\}$  and if the random variable X is defined as  $X = X(S) = S^2$ , map the elements of random variable on the real line and explain. [7M]

**(OR)**

4. a) State and prove any three properties of probability Distribution function [7M]
- b) If the probability density of a random variable is given by [7M]  
$$f_X(x) = K(1 - x^2) \quad 0 < x < 1$$
find the value K and  $F_X(x)$ .

### UNIT-III

5. a) Explain in brief about marginal distribution and density functions [7M]
- b) The joint density function of X and Y is [7M]

$$f_{XY}(x, y) = \begin{cases} \frac{xy}{9} & \text{for } 0 < x < 2, 0 < y < 3 \\ 0 & \text{otherwise} \end{cases}$$

- i) Show that X and Y are statistically independent.
- ii) Show that X and Y are uncorrelated

**(OR)**

6. a) Explain central limit theorem with equal and unequal distributions [7M]
- b) The joint pdf of two variables X, Y is  $f_{X,Y}(x, y) = ae^{-(x+y)}$  for  $x \geq 0, y \geq 0$ . Are X and Y independent? [7M]

#### UNIT-IV

7. a) Define a random process and explain the classification of random process based on time  $t$  and amplitude of random variable  $x$  with neat diagrams? [7M]  
b) Prove that the random process  $X(t) = A \cos(\omega_c t + \theta)$  is wide sense stationary if it is assumed that  $\omega_c$  is a constant and  $\theta$  is a uniformly distributed variable in the interval  $(0, 2\pi)$ . [7M]

(OR)

8. a) What is auto correlation function of a random process state its properties [7M]  
b) For a given random process  $X(t)$ , the mean value is  $E[X] = 6$  and auto-correlation  $R_{xx}(\tau) = 36 + 25 \exp(-\tau)$ . Find (i) find the average power of the process  $X(t)$  and (ii) Variance of  $X(t)$ . [7M]

#### UNIT-V

9. a) Define cross power density spectrum and prove its properties? [7M]  
b) The auto-correlation of a WSS random process  $X(t)$  is given by [7M]  
 $R_{xx}(\tau) = A \cos(W_c \tau)$   
where  $A$  and  $W_c$  are constants.  
Find Power spectral density.

(OR)

10. a) Define power density spectrum and prove its properties? [7M]  
b) A WSS noise process  $N(t)$  as ACF  $R_{NN}(\tau) = P e^{-3|\tau|}$  [7M]  
Find PSD and plot both ACF and PSD

**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS  
(Common to CE & ME)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1.
  - a) Define Macro Economics.
  - b) Define Micro Economics.
  - c) What is Angle of Incidence?
  - d) Define Book cost.
  - e) What is Imperfect Competition?
  - f) Define Penetration pricing.
  - g) What is capital budgeting.
  - h) Define Internal Rate of Return.
  - i) What are profitability Ratios.
  - j) What are Solvency Ratios.

**PART-B****Answer one question from each unit****[5x12=60M]****UNIT-I**

- 2 Explain in detail, the various methods of demand forecasting, giving suitable examples. 12
- (OR)
3. Explain the different types of price elasticity's of demand and also the methods of measuring price elasticity 12

**UNIT-II**

4. Examine the importance of least cost combination of inputs from the point of view of a manufacturer. 12
- (OR)
5. Explain in detail, the various types of costs and their applications. 12

**UNIT-III**

6. Examine the features, advantages and limitations of Partnership form of business organisation. 12
- (OR)
7. Explain in detail, the concept of business cycle and the various phases of business cycle. 12

# AR13

**CODE: 13HS2004**

**SET-2**

## UNIT-IV

8. a) Examine the need and importance of capital budgeting decisions. 6  
b) Explain the various discounting cash flow techniques. 6
- (OR)
9. Rank the following projects in order of their desirability according to a) Pay Back Period 12  
method (PBP) & b) Net Present Value method (NPV)

Project	Initial Outlay ( in Rs)	Annual cash flow(in Rs )	Life in years
A	10,000	2500	5
B	8,000	2600	7
C	4,000	1000	15
D	10,000	2400	20
E	5,000	1125	15
F	6,000	2400	6
G	2,000	1000	2

## UNIT-V

10. Write a detailed note on different accounts. 12

(OR)

11. The following information is given above about M/s.S.P.Ltd for the year ending 12  
Dec.31.2002.
- Stock turnover Ratio = 6 times  
Gross Profit Ratio = 20% on sales  
Sales for 2002 = Rs.3, 00,000  
Closing Stock is Rs.10, 000 more than Opening Stock.  
Opening Creditor =Rs.20, 000  
Closing Creditor = Rs.30, 000  
Trade debtor at the end = Rs.60, 000  
Net Working capital = Rs. 50,000
- Calculate (a) Average Stock (b) Purchases (c) Creditors Turnover ratio (d) Average Payment Period (e) Average Collection Period (f) Working Capital Turnover ratio.

**ELECTRICAL CIRCUIT ANALYSIS-II  
(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 70M****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Draw the interconnection between a three phase delta connected source and a star connected load.
- b) In a three phase unbalanced star connected system, what is the vector sum of the currents in the three lines?
- c) When a series RC circuit is connected to a constant voltage source at  $t=0$ , find the current passing through the circuit at  $t=0^+$  ?
- d) An RL circuit has  $R=2\Omega$  and  $L=4H$ . Find the time needed for the inductor current to reach 40 percent of its steady-state value is?
- e) What is the condition for transient current is oscillatory for a series RLC circuit with an AC excitation?
- f) What is the Laplace transform of the first derivative of a function  $f(t)$ ?
- g) In the first Cauer LC network, what consists the driving point function when the first element is a series inductor?
- h) Define positive real function.
- i) Define decibel (dB).
- j) List-out the merits of m-filters.

**PART-B****Answer one question from each unit****[5x12=60M]****UNIT-I**

2. a) A balanced three phase three wire system has a star connected 8M load. Each phase contains three loads in parallel:  $-j100\Omega$ ,  $100\Omega$  and  $(50+j50)\Omega$ . Assume positive sequence with  $V_{ab}=400\angle 0^\circ$  V. Find i)  $V_{an}$  (ii)  $I_{aN}$  (iii) The total power drawn by the load.
- b) Two wattmeters are connected to measure power in a three 4M phase circuit. The reading of one of the meters is 5KW when the load power factor is unity. If the power factor of the load is changed to 0.707 lagging, without changing the total input power, calculate the readings of the two wattmeters.

**(OR)**



3. a) A three phase, four wire, 380V supply is connected to an 6M unbalanced load having phase impedances of  $Z_R=(4+j3)\Omega$ ,  $Z_Y=(4-j3)\Omega$  and  $Z_B=2\Omega$ . Impedance of neutral wire is  $Z_n=(1+j2)\Omega$ . Find the phase currents and voltages of the load using Millman's theorem.
- b) The balanced load in Fig.1 is fed by a balanced three phase 6M system having  $V_{ab}=230\angle 0^\circ$  V rms and positive phase sequence. Find the reading of each wattmeter and the total power drawn by the load.

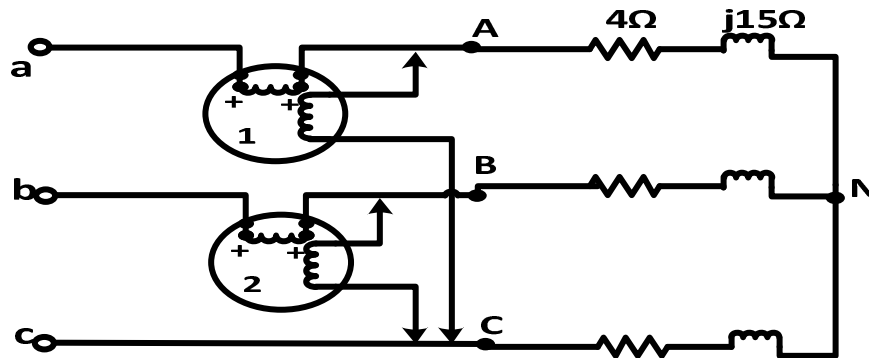


Fig.1

## UNIT-II

4. a) For the circuit of Fig.2, Find the voltage labeled 'v' at  $t=200$   $\mu\text{sec}$ . 6M

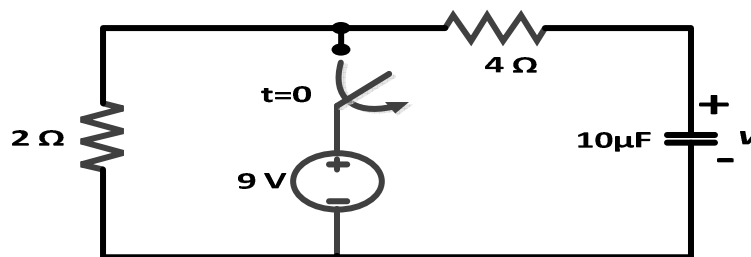


Fig.2

- b) Find  $v(0^+)$  and  $i_1(0^+)$  for the circuit shown in fig.3, if  $v(0^-)=V_0$ . 6M

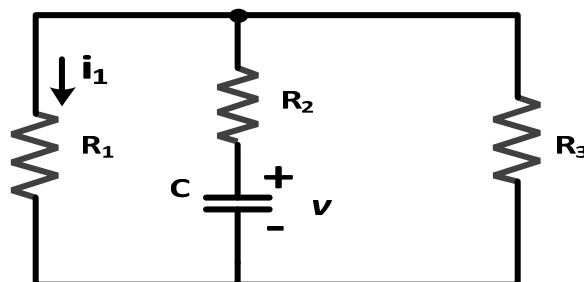


Fig.3

(OR)

5. a) Assuming the switch initially has been open for a really long time. 6M  
 time.  
 (i) Obtain an expression for  $i_w$  in the circuit of fig.4 which is valid for all  $t \geq 0$ .  
 (ii) Calculate  $i_w$  at  $t=0$  and  $t=1.3\text{ns}$ .

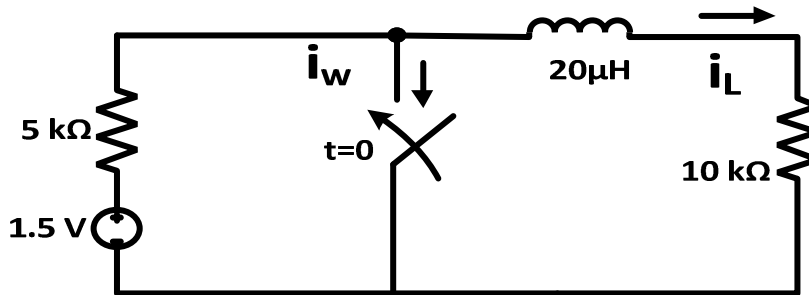


Fig.4

- b) The switch shown in fig.5 has been closed for 6 years prior to being flipped open at  $t=0$ . Determine  $i_L$ ,  $v_L$ , and  $v_R$  at  $t$  equal to  
 (i)  $t=0^+$  sec (ii)  $t=1\mu\text{sec}$  6M

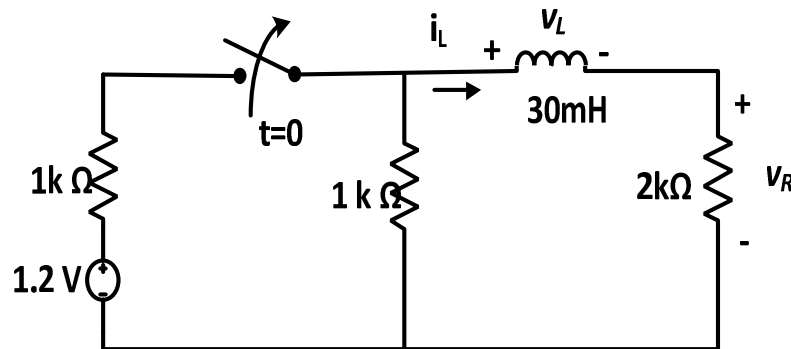


Fig.5

### UNIT-III

6. a) For the circuit shown in fig.6, determine the current through the circuit, when the switch is moved from position 1 to position 2. 6M

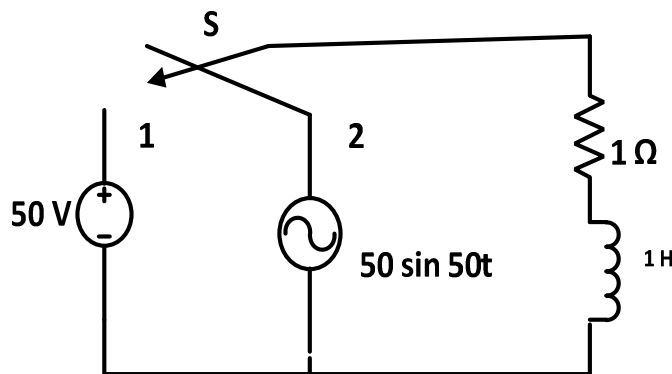


Fig.6

- b) Derive the expression for the transient response of RC series circuit with unit step input. 6M

(OR)

7. a) For the circuit shown in fig.7, determine the total current delivered by the source when the switch is closed at  $t=0$ . 8M

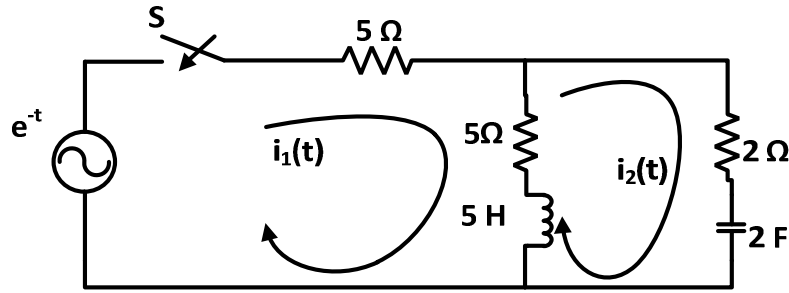


Fig.7

- b) Derive an expression for the current response of an RL series circuit with sinusoidal excitation. 4M

#### UNIT-IV

8. a) Test whether the following polynomials are Hurwitz. 4M  
 (i)  $s^4 + s^3 + 6s^2 + 3s + 4$  (ii)  $s^3 + 3s^2 + 6s + 18$   
 b) Find the first and second Foster form of the network whose driving point impedance is  $Z(s) = \frac{3(s+2)(s+4)}{(s+1)(s+3)}$  8M

(OR)

- 9 Find the second Cauer form of the given function 12M

$$Z(s) = \frac{(s+1)(s+3)}{s(s+2)}$$

#### UNIT-V

10. a) Design a constant-K low pass filter(both T and  $\pi$  sections)having a cut-off frequency of 3 kHz with a load resistance of  $600\Omega$ . 6M  
 b) Design a k type band pass filter(both T and  $\pi$  sections) having a design impedance of  $500\Omega$  and cut-off frequencies  $f_1=1$  kHz and  $f_2=10$ kHz. 6M

(OR)

11. a) Design a constant k-type band elimination,T-section filter having a design impedance of  $500\Omega$  and cut-off frequencies 1kHz and 5kHz. 6M  
 b) Design an m-derived low pass filter (both T and  $\pi$  sections ) with a cut-off frequency of 1 kHz,design impedance of  $400\Omega$  and the resonant frequency of 1100Hz. 6M