AR20

CODE: 20ESI204 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech.II Semester Regular Examinations, July, 2022

PYTHON PROGRAMMING

(Common to CE, 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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a	Explain the features of python programming	5	1	2
	b	Illustrate the different types of control flow statements available in Python with flowcharts.	5	1	2
		(OR)			
2.	a	Explain detail about the data types in Python?	5	1	2
	b	What are operators in Python? Describe specifically about identity and membership operator?	5	1	2
			Marks	CO	Blooms Level
		UNIT-II			
3.	a	Write a short note on Python Dictionaries?	5	2	2
	b	Write a Python program to count Uppercase, Lowercase, special character and numeric values in a given string	5	2	3
		(OR)			
4.	a	What is a list? List the differences between the sequences Lists and Tuples.	5	2	2
	b	Write a Python program to count repeated characters in a string	5	2	3
			Marks	CO	Blooms Level
		UNIT-III			
5.	a	Write the python programs to calculate the following to find power of a number using recursive function	5	3	3
	b	Explain Lambda function with example	5	3	2
		(OR)			
6.	a	Explain file I/O Operations in python with example.	5	3	2
	b	Describe the different access modes of the files with an example	5	3	2
			Marks	CO	Blooms Level
		UNIT-IV			
7.	a	What is package in Python? Explain, how can you use package in your program with an example code?	5	4	2
	b	Write a python program to define a module to find factorial of a Number and import the module to another program.	5	4	3
		(OR)			
8.	a	Differentiate between module and package in Python	5	4	3
	b	Explain about built-in modules in python	5	4	2
			Marks	CO	Blooms Level
		UNIT-V			
9.	a	Write a Python program to demonstrate the use of super() function.	5	5	2
	b	What is operator overloading in Python? Explain with an example	5	5	3
		(OR)			
10.	a	Write a python Program to demonstrate the Overriding of the Base Class method in the Derived Class.	5	5	3
	b	Write Python Program to Demonstrate Multiple Inheritance .	5	5	2
			Marks	CO	Blooms Level
		UNIT-VI			
11.	a	Write about Special Symbols and Characters in python Regular expressions	5	6	2
	b	Write a python Program to remove all whitespaces using regular expressions.	5	6	3
		(OR)			
12.	a	Discuss the following methods supported by compiled regular expression objects. a) search() b) match() c) findall()	6	6	2
	b	Why do you need regular expressions in Python?	4	6	1

AR20

CODE: 20ECT205 SET-1

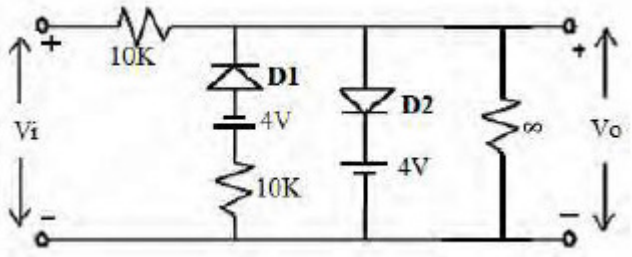
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech.II Semester Regular Examinations, July, 2022

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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a	Draw the response of an RC high pass circuit when applied with step input. Explain the response for different time constants.	5	1	2
	b	What is High Pass Filter? Prove that a high pass circuit acts as an differentiator.	5	1	2
		(OR)			
2.	a	Observe the response of an RC low-pass circuit to a square wave input for long, medium and short time constants.	5	1	2
	b	What is an attenuator? How can an uncompensated attenuator be modified as a compensated attenuator.	5	1	4
		UNIT-II	Marks	CO	Blooms Level
3.		A voltage signal of (10 Sinωt) is applied to the circuit with ideal diodes shown in figure below. Estimate the maximum & minimum values of output waveform and maximum current through each diode. Also draw the input-output waveforms with proper explanation. 	10	2	3
		(OR)			
4.	a	Give the circuits of different types of shunt clippers and explain their operation with the help of their transfer characteristics.	5	2	2
	b	Compare clippers and clampers with suitable examples.	5	2	2
		UNIT-III	Marks	CO	Blooms Level
5.	a	Draw the circuit of a Schmitt trigger and mention some of its applications.	5	4	2
	b	Discuss about Diode forward recovery time and Diode reverse recovery time.	5	3	4

(OR)

			Marks	CO	Blooms Level
	a	What are different types of multivibrators? Explain the stable state and quasi stable states of a multivibrator.	5	4	2
6.	b	Define rise time, storage time, fall time, and turn off time in the case of transistor as a switch with suitable waveforms.	5	3	2

UNIT-IV

			Marks	CO	Blooms Level
7.		With the help of circuit diagram demonstrate the working of free running multivibrator and derive frequency of oscillations	10	4	4

(OR)

8.	a	Explain monostable multivibrator with neat sketch?	5	4	3
	b	Show that the expression for time period monostable multivibrator is T=0.693RC	5	4	2

UNIT-V

			Marks	CO	Blooms Level
9.		Describe Miller Time Base generator with a neat sketch?	10	5	4

(OR)

10.	a	Illustrate the circuit of transistorized bootstrap sweep generator and explain its working?	5	5	2
	b	State the need of time base signal. List out various methods to generate time base signals.	5	5	2

UNIT-VI

			Marks	CO	Blooms Level
11.	a	Write the basic concept of sampling gate. Mention the applications of sampling gates?	5	6	2
	b	With the help of a neat diagram, explain the working of a six-diode gate?	5	6	2

(OR)

12.	a	Explain bidirectional diode sampling gate with neat sketch?	5	6	2
	b	How pedastal can be reduced in sampling gate? List the applications of Sampling gates.	5	6	2

AR20

CODE: 20CST205 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech. II Semester Regular Examinations, July, 2022

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE & IT)

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

			Marks	CO	Blooms Level
		UNIT-I			
1.		Describe various asymptotic notations.	10	CO1	K1
		(OR)			
2.	a	Illustrate the importance of probability analysis?	5	CO1	K1
	b	Differentiate between priori analysis and posteriori analysis. Illustrate the same with an example	5	CO1	K2
		UNIT-II	Marks	CO	Blooms Level
3.	a	Elucidate Quick sort algorithm and simulate it for the following data: 20, 35, 10, 16, 54, 21, 25.	5	CO2	K2
	b	Design and demonstrate iterative binary search algorithm and Examine its Time complexity in Worst case, Best case and Average cases.	5	CO2	K3
		(OR)			
4.	a	Describe the advantage of Strassen's matrix multiplication when compared to normal matrix multiplication for the any two 8 x 8 matrices.	5	CO2	K1
	b	Solve the recurrence relation using substitution method $T(n)= \{ T(1) \quad n=1 \quad aT(n/b)+f(n) \; n>1$,where a=5,b=4,and $f(n)=cn^2$	5	CO2	K3
		UNIT-III	Marks	CO	Blooms Level
5		Solve the job sequencing with deadline problem using greedy method for the given data N=7,P={3,5,20,18,1,6,30} are profits and D={1,3,4,3,5,1,2} are deadline respectively.	10	CO1	K3
		(OR)			
6.	a	Demonstrate briefly about the knapsack problem with suitable example	5	CO1	K2
	b	Obtain the minimum cost spanning tree for a graph G(6,10) with vertices named as a,b,c,d,e,f and edges ab=1, bc=3, af=9,ae=4, ed=6, fe=4, fd=5, cd=6, cf=4 and bf=4 using Kruskal's algorithm and showing results in each stages.	5	CO3	K3

UNIT-IV

			Marks	CO	Blooms Level
7		Solve the following Knapsack problem using dynamic programming. Capacity W=5.	10	CO4	K3

Item	1	2	3	4
Weight	2	1	3	2
Value	12	10	20	15

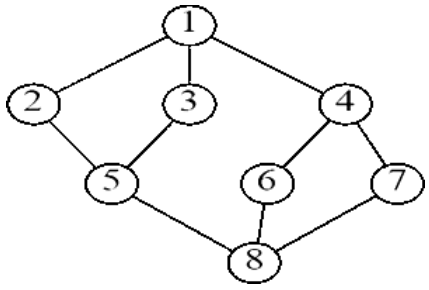
(OR)

8		Obtain the shortest tour of traveling sales person for the following cost matrix using dynamic Programming	10	CO4	K3

$$\begin{vmatrix} \infty & 12 & 5 & 7 \\ 11 & \infty & 13 & 6 \\ 4 & 9 & \infty & 18 \\ 10 & 3 & 2 & \infty \end{vmatrix}$$

UNIT-V

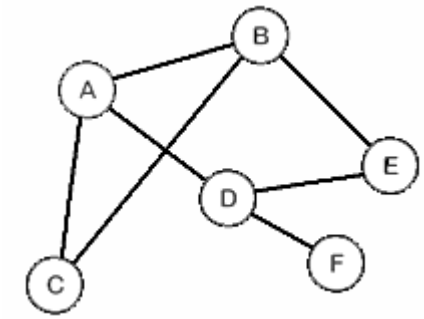
			Marks	CO	Blooms Level
9.	a	Define bi-connected component. List out different data structures used for implementing the breadth first search and depth first search.	5	CO5	K1
	b	Demonstrate breadth first traversal algorithm for the following graph	5	CO5	K3



With the starting vertices as 6 and 7.

(OR)

10.	a	Write an algorithm for N-queens problem using backtracking	5	CO5	K1
	b	Apply the backtracking algorithm to color the following graph	5	CO5	K3



UNIT-VI

			Marks	CO	Blooms Level
11		Draw the portion of the state space tree generated by LCBB for the knapsack instance: n=5,(p1,p2,p3,p4,p5)=(w1,w2,w3,w4,w5)=(4,4,5,8,9), and m=15.	10	CO6	K3

(OR)

12.	a	Distinguish NP- hard and NP-complete problems	5	CO6	K2
	b	Prove Hamiltonian cycle is in NP	5	CO6	K3

AR18

CODE: 18CET206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, July-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)	Explain the weathering effect over the properties of rock?	6M
	b)	Write a short note on Tehri Dam and its geological features?	6M
		(OR)	
2.	a)	What are the geological features that affect the location of dam?	6M
	b)	Explain Endogenous and Exogenous geological agents with examples?	6M

UNIT-II

3.	a)	Mention the most common types of rock-forming minerals.	6M
	b)	What are the types of granite? State the physical properties of granite	6M
		(OR)	
4.	a)	Describe the various types of structures and textures associated with igneous rocks?	6M
	b)	Differentiate between foliated and non-foliated rocks?	6M

UNIT-III

5.	a)	Define the fallowing terms; strike, dip and outcrop.	6M
	b)	Differentiate between faults and joints	6M
		(OR)	
6.	a)	Classify faults based on important parameters and explain briefly.	6M
	b)	Explain a situation when a high angle and low angle faults can occur	6M

UNIT-IV

7.	a)	Briefly explain causes and effects of landslides.	6M
	b)	Explain factors Influencing Seismic Wave Velocities.	6M
		(OR)	
8.	a)	Discuss about preventive measures of landslides.	6M
	b)	Explain the magnitude of earth quake?	6M

UNIT-V

9.	a)	Discuss briefly the geological considerations for the construction of dam	6M
	b)	Discuss the importance of structural geology in the selection of dam site with neat sketches.	6M
		(OR)	
10.	a)	Discuss in brief the geological considerations for the successful reservoir	6M
	b)	Discuss the suitability of different rocks encounters in the reservoir site	6M

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AR18

CODE: 18BST209 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July, 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)	What is the need to study of biology and explain it with a suitable example	6M
	b)	What are the cotemporary aspects of biology as an independent scientific discipline	6M
		(OR)	
2.	a)	Examine the role of biological contributions in engineering during 18^{th} century	6M
	b)	Explain physical properties of Cytoplasm with reference to Brownian movement	6M

UNIT-II

3.	a)	Compare and contrast between Prokaryotes and Eukaryotes	6M
	b)	What are the principles of taxonomy? and mention three kingdoms of life	6M
		(OR)	
4.	a)	Describe the structure and functions of compound microscope	6M
	b)	Summarize the main constituents in culture media along with their functions	6M

UNIT-III

5.	a)	Derive Mendel's Laws of inheritance from his experiments	6M
	b)	Describe the double helix structure of the DNA molecule	6M
		(OR)	
6.	a)	Explain different phases of Mitosis and its significance	6M
	b)	Write in brief about the concept of Genetic Code	6M

UNIT-IV

7.	a)	Write about the classification and nomenclature of Enzymes	6M
	b)	Explain the Mechanism of enzyme action with suitable examples	6M
		(OR)	
8.	a)	Discuss the Enzyme kinetics and kinetic parameters	6M
	b)	Examine the role of proteins as enzyme transporters and receptors	6M

UNIT-V

9.	a)	Define endothermic reaction and demonstrate the Glycolysis cycle	6M
	b)	Explain the light reaction of Photosynthesis in plants	6M
		(OR)	
10.	a)	What is exergonic reaction and demonstrate the Krebs cycle	6M
	b)	Evaluate the process of CO2 fixation through the Kelvin cycle	6M

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AR18

CODE: 18ECT210 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, July, 2022

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)	Explain the response of RC High Pass circuit for the following input Step waveforms	6M
	b)	Prove that an RC circuit behaves as a good integrator if RC > 15T, where T is the period of an input signal.	6M
		(OR)	
2.	a)	Explain the response of RC High Pass circuit for the following input Pulse waveforms.	6M
	b)	What is an attenuator? How can an uncompensated attenuator be modified as a compensated attenuator?	6M

UNIT-II

3.	a)	Explain the working of a two-level diode clipper with the help of circuit diagram, waveform and transfer characteristics.	6M
	b)	Draw the basic circuit diagram of positive peak clamper circuit and explain its operation.	6M
		(OR)	
4.	a)	Determine the output waveform for the biased clipping circuit for the square wave input.	6M
	b)	A symmetrical 50 Hz square wave whose peak-to-peak excursions are ± 100 V with respect to ground is to be negatively clamped at 25 V. Draw the necessary circuit diagram and output waveform for this purpose.	6M

UNIT-III

5.	a)	Give a brief note on piece-wise linear diode characteristics.	6M
	b)	What are the reasons for existence of rise time and fall time in transistor?	6M
		(OR)	

6. a) Explain the switching characteristics of Transistor? 6M
   b) A fixed bias Bi-stable multivibrator circuit uses a DC supply of ±12 V, R_C=2kΩ, R_1=10kΩ and R_2=47kΩ. NPN silicon transistor with $V_{CE(sat)}$ = 0.1 V, $V_{BE(sat)}$ = 0.7V and h_{FE} (min)=30 are used i. Draw the circuit diagram and show the stable state currents assuming that transistor Q1 is OFF and Q2 is ON. ii. Calculate all currents and voltages and verify the device states. 6M

UNIT-IV

7. a) Explain the need of trigger circuit in monostable multivibrator? List out types of trigger circuits? 6M
   b) Design an astable multivibrator to generate a 5kHz square wave with a duty cycle of 60% and amplitude 12V. Use NPN silicon transistors having $h_{FE(min)}$= 70, $V_{CE(sat)}$ = 0.3V, $V_{BE\ (sat)}$ = 0.7V, $V_{BE\ (cutoff)}$ = 0v and R_C = 2KΩ. 6M

(OR)

8. a) Explain about free running multivibrator. 6M
   b) Explain the principle of operation monostable multivibrator and also derive the expression for pulse width (gate width). 6M

UNIT-V

9. a) Explain the working of a transistor Bootstrap sweep circuit and derive expression for the slope sweep error. 6M
   b) Why the time base generators are called sweep circuits? Give most important applications of time –base generators. 6M

(OR)

10. a) Explain how to cancel the pedestal in a sampling gate with suitable circuit diagram. 6M
    b) Draw the circuit diagram of a unidirectional sampling gate and explain its working. 6M

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AR18

CODE: 18CST205 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, July, 2022

COMPUTER ORGANIZATION & ARCHITECTURE

(Common to CSE AND IT)

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)	Explain function unit of computer with a neat diagram.	6M
	b)	What is the difference between a direct and an indirect address instruction? How many references to memory are needed for each type of instruction to bring an operand into a processor register?	6M
		(OR)	
2.	a)	List the characteristics of RISC and CISC	6M
	b)	Define ISA. What is the role of ISA in organization.	6M

UNIT-II

3.	a)	Convert the following numbers into IEEE Standard 754 Floating Point representation (single precision): $(42.12)_{10}$	6M
	b)	Explain about Carry look-ahead adder	6M
		(OR)	
4.	a)	Explain Booth Multiplication algorithm with example.	12M

UNIT-III

5.	a)	Differentiate between write through and write back methods in cache	6M
	b)	Analyze the memory hierarchy in terms of speed, cost and size.	6M
		(OR)	
6.	a)	Explain different types of mapping functions in cache memory	12M

UNIT-IV

7.	a)	What are handshaking signals? Explain the handshake control of data transfer during input and output operation.	6M
	b)	With a neat sketch explain the working principle of DMA	6M
		(OR)	
8.	a)	Draw the block diagram for asynchronous communication interface and Explain.	6M
	b)	Explain the Daisy Chaining priority with neat diagram.	6M

UNIT-V

9.	a)	Draw a space-time diagram for a six segment pipeline showing the time it takes to process eight tasks	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
		(OR)	
10.	a)	Discuss the differences between tightly coupled multiprocessors and loosely coupled multiprocessors from the view point of hardware organization and programming techniques.	6M
	b)	Draw a diagram for 4 dimensional hypercube. List all the paths available between node 7 to node 9 that use minimum number of intermediate nodes.	6M

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AR16

CODE: 16EE2010 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July, 2022

.

ELECTRO MAGNETIC FIELD THEORY

(Electrical & Electronics Engineering)

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 ρ_S C/m2.	10 M
	b)	Explain the relationship between the Cartesian and Spherical systems.	4 M
		(OR)	
2.	a)	State Gauss's Law and Derive an expression for the Electric Field Intensity at any point due to an infinite line of charge.	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 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 and (ii) 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 infinite sheet of current.	10 M
	b)	Find the flux passing the portion of the plane $\phi = \pi/4$ defined by $0.01<r<0.05$ m and $0<z<2$ 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. 9 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 cm^2. Find the Self-inductance of the winding if the relative permeability of iron is 800. 5 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

AR16

CODE: 16EC2012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July, 2022

RANDOM VARIABLES AND STOCHASTIC PROCESSES

(Electronics and Communication Engineering)

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 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={Sum=7} (ii) B={8< Sum less than or equal to 11} (iii) C={10< Sum}

UNIT-II

3. a) What is a random variable? What are the conditions for a function to be a random variable [7M]
   b) If the probability of a defective fuse from a manufacturing unit is 2%, in a box of 200 fuses, find the probability that [7M]
   i) Exactly 4 fuses are defective ii) more than 3 fuses are defective.

(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]

$$f_{X,Y}(x,y) = \begin{cases} \frac{xy}{9} & for \quad 0 < x < 20,\ 0 < y < 3 \\ 0 & otherwise \end{cases}$$

Find the conditional density function

(OR)

6. a) Explain central limit theorem with equal and unequal distributions [7M]
   b) Random variable X and Y have the joint density functions [7M]

$$f_{X,Y}(\frac{(x+y)^2}{40} \qquad -1<x<1 \ \ and \ \ -3<y<3$$

f(x,y)=0 for other x and y values.

i) Find all the second order moments of X and Y
ii) What are the variances of X and Y

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 processs $X(t)= ACos(\omega_c t+\theta)$ is wide sense stationary if it is assumed that ω_c is a constant and θ 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) Explain time average and Ergodicity in detail. [7M]

UNIT-V

9. a) Derive WIENER-KHINCHINE relations. [7M]
   b) The auto-correlaion of a WSS random process X(t) is given by [7M]
   $Rxx(\tau) = A \cos(Wc\ \tau)$
   where A and Wc are constants.
   Find Power spectral density.

(OR)

10. a) Define cross power density spectrum and prove its properties? [7M]
    b) Check whether the function below is a valid power density spectrum or not. [7M]

$$\frac{\omega}{j\omega^6+\omega^2+3}$$

AR13

CODE: 13HS2004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July, 2022

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) Explain Microeconomics
   b) What do mean by Demand Forecasting
   c) Iso-costs
   d) BEP
   e) Market Structure
   f) Peak Load Pricing
   g) Need for Capital Budgeting
   h) IRR
   i) Journal
   j) Trail Balance

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Explain in detail the nature and scope of Managerial Economics 6M
   b) How Micro Economics differs from Managerial Economics? 6M

(OR)

3. a) What is Elasticity of Demand? Explain Price, Cross and Income 6M
   b) Explain Point Method and Arc Methods 6M

UNIT-II

4. a) Draw a neat diagram for Isoquants and Isocosts and Explain 6M
   b) Demonstrate Least Cost Combination of Inputs 6M

(OR)

5. a) Outline Cost concept and types of costs 6M
   b) What is BEP and Explain with a Diagram 6M

UNIT-III

6. a) List the Features of Monopolistic Competition 6M
   b) Explain Price-Output Determination under Monopolistic Competition 6M

(OR)

7. a) Explain Market Skimming, Penetration Pricing, Bundling Pricing and Peak Load Pricing 6M

b) Describe the Features of business cycles and explain the Phases of business cycles 6M

UNIT-IV

8. a) What is the Need for capital budgeting 4M

b) A Machine costs Rs. 60,000 with an economic life of 6 Years. Annual cash inflows are expected to be Rs. 25,000. The machine has no scrap value and is depreciated under straight line method. Calculate ARR. 8M

(OR)

9. a) A Limited company is considering investment in a project requiring a capital outlay of Rs. 2,00,000/-. The projected annual cash inflows are as follows: 8M

Year	1	2	3	4	5
Cash Inflow	50,000	60,000	70,000	60,000	50,000

Calculate NPV.

b) What is Funds flow statement and explain its significance. 4M

UNIT-V

10. a) Explain Double-entry system 6M

b) Name the Limitations of Financial Statements 6M

(OR)

11. a) Outline the Accounting conventions 6M

b) From the following transactions pass Journal entries and post them in the appropriate Ledger Accounts in the books of Rakesh Ltd. 6M

Date	Transaction
01st May 2018	Commenced business with Rs. 100000/-
05th May 2018	Purchased goods from Rahul & Co Rs. 10000/-
07th May 2018	Sold goods worth Rs. 20000/-
10th May 2018	Salaries paid Rs. 1500/-
11th May 2018	Purchased stationary worth Rs. 1000/-
15th May 2018	Bought furniture worth Rs. 20000/-
18th May 2018	Cash deposited into bank Rs. 9000/-
20th May 2018	Paid wages Rs. 5000/-
24th May 2018	Cash withdrawn from Bank Rs. 3000/-
28th May 2018	Paid rent by Cheque Rs. 1800/-

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AR13

CODE: 13EE2010 **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July, 2022
ELECTRICAL CIRCUIT ANALYSIS-II
(Electrical and Electronics Engineering)

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

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

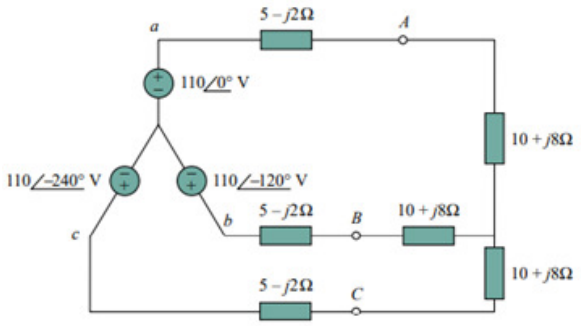
1. a) What is the phase angle between any two phases in a balanced three phase system?
   b) The equation for neutral current incase of a three phase four wire system.
   c) Why two watt-meter method is more preferable to determine power of the three-phase system
   d) What is the time constant of series R-L circuit?
   e) Define natural response.
   f) What is the time constant of series R-C circuit
   g) Voltage across capacitor cannot change instantaneously. Justify.
   h) Define synthesis
   i) Define low pass filter.
   j) Define band elimination filter

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Calculate the line currents in the three-wire Y-Y systems shown in figure 6M



   b) What are the advantages of three-phase system over single phase system. 6M

(OR)

3. Explain detail about Millimann's theorem method for solving three-phase unbalanced circuits 12M

UNIT-II

4 A coil has resistance of 1 Ω and an inductance of 1 H. It is suddenly connected to 6 V DC voltage source. Calculate the following:
1. Initial and final values of current
2. Time constant
3. Rate of change of current at t = 0 and t = ∞
4. Voltage across inductance at t = 0 and t = ∞
5. Voltage across resistance at t = 0 and t = ∞ and
6. Current at t = 1 s.

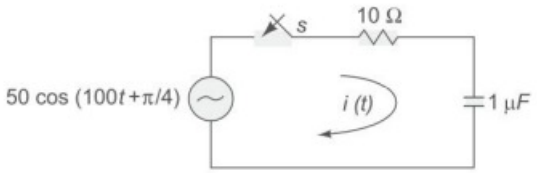
(OR)

5. Determine transient response of R - C circuit using Laplace transform with DC excitation. 12M

UNIT-III

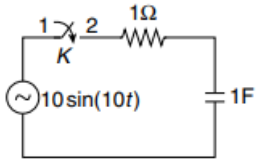
6. a) Derive expression for current of an inductor and a resistor in series on application of AC voltage. 6M

   b) In the circuit shown in Figure. determine the complete solution for the current when the switch S is closed at t = 0. Applied voltage is V(t)= $COS(10^2t+\pi/4)$. Resistance R = 10 ohm and capacitance C =1 μF. 6M



(OR)

7. For the given circuit shown in Figure. Find the complete solution for current i(t) using Laplace transformation. Assume zero charge across the capacitor before switching. 12M



UNIT-IV

8. a) State the properties of a positive real function. 6M

   b) Test if the polynomial $S^3 + 6S^2 + 12S + 8$ is Hurwitz. 6M

(OR)

9. The driving point impedance of a one-port LC network is given by the following. 12M

$$Z(s) = 3\frac{(s^2+1)(s^2+16)}{s(s^2+9)}$$

Obtain the first Foster form.

UNIT-V

10. Design the T- and p-Section of a constant K-type LPF having a cut-off frequency of 10 kHz and design impedance of 450W. Further, find its characteristic impedance and phase constant at 5kHz as well as determine the attenuation at 12kHz 12M

(OR)

11. Design m-derived HPF having a design impedance of 300W, cut-off frequency of 2000Hz and frequency of infinite attenuation of 1700Hz 12M