O.P.Code: 20HS0823	R20	H.T.No.									

20.8.24

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Supplementary Examinations August-2024
RESEARCH METHODOLOGY AND IPR
(Common to all)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	What do you understand by the term Research Problem? What are the objectives of the Research Problem?	CO1	L2	12M
	OR			
2	Explain different sources of the research problem by giving suitable examples under source.	CO1	L3	12M

UNIT-II

3	What are the various means of conducting literature surveys in modern times?	CO2	L2	12M
	OR			
4	Give a detailed description on the maintenance of ethics in research work.	CO2	L3	12M

UNIT-III

5	Explain essential features of report writing highlighting the importance and implication of research outcomes.	CO3	L2	12M
	OR			
6	What is technical writing? What tools do technical writers use?	CO3	L2	12M

UNIT-IV

7	Discuss Radical Innovation and Incremental Innovation by quoting real-time examples.	CO4	L3	12M
	OR			
8	What is the difference between copyrights, trademarks, and patents?	CO4	L3	12M

UNIT-V

9	What does it mean to "Licence a Patent" and why is it done?	CO5	L3	12M
	OR			
10	What are the new developments in IPR with respect to the administration of patent system? Explain in detail.	CO5	L3	12M

***** END *****

O.P.Code: 20CE1011	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Supplementary Examinations August-2024
STRUCTURAL HEALTH MONITORING
(Structural Engineering)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	Brief our scope of maintenance and list out various facts of maintenance.	CO1	L2	12M
	OR			
2	Explain importance of maintenance various aspects of inspection.	CO1	L1	12M

UNIT-II

3	What is structural audit and explain purpose of structural audit.	CO2	L1	12M
	OR			
4	Explain in detail assessment of a health of a structure.	CO2	L1	12M

UNIT-III

5	List out various advantages and disadvantages of types of static tests in static field testing.	CO3	L1	12M
	OR			
6	Define static field testing and types of static tests.	CO3	L1	12M

UNIT-IV

7	Describe the procedure of forced vibration method.	CO4	L2	12M
	OR			
8	Explain the procedure of ambient vibration and its importance.	CO4	L1	12M

UNIT-V

9	Explain in detail sensor technology in structural Health monitoring.	CO5	L2	12M
	OR			
10	List out various advantages and disadvantages of piezoelectric materials	CO5	L1	12M

***** END *****

O.P.Code: 20CS5001	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester Supplementary Examinations August-2024

Advanced Data Structures

(CSE)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Define Hashing. Explain the Hash Functions with suitable example.	CO1	L3	12M
		OR			
2	a	With an example explain quadratic probing and use hashing.	CO1	L5	6M
	b	Differentiate between linear probing and quadratic probing	CO1	L4	6M

UNIT-II

3	a	Explain the structure of probabilistic skip list	CO2	L3	6M
	b	What is the search cost of probabilistic skip list	CO2	L2	6M
		OR			
4	a	What is binary search tree and explain advantages of binary search tree.	CO2	L3	4M
	b	Create a binary search tree with the following data elements 45, 15, 79, 90, 10, 55, 12, 20, 50	CO2	L5	8M

UNIT-III

5		Implement the text processing software by applying brute force pattern matching	CO3	L6	12M
		OR			
6		Compare standard Tries , Compressed Tries and suffix Tries	CO4	L6	12M

UNIT-IV

7		Explain how to Search a Priority Search Tree works and its operations.	CO5	L2	12M
		OR			
8		What is Priority Range Trees discuss with an example?	CO5	L3	12M

UNIT-V

9		In the real world where we will use hash functions. Justify.	CO6	L6	12M
		OR			
10		What are the advantage and disadvantage of Hashing?	CO6	L1	12M

***** END *****

O.P.Code: 20CS5002	R20	H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Supplementary Examinations August-2024
PYTHON PROGRAMMING
(Computer Science & Engineering)

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

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1		Describe the list and its methods with example.	CO1	L1	12M
		OR			
2	a	Discuss the basic Tuple operations with examples.	CO2	L6	6M
	b	Illustrate the input and output statements with example.	CO1	L2	6M
		UNIT-II			
3	a	What are the different loop control statements available in Python? Explain with suitable examples.	CO1	L1	6M
	b	Discuss the Membership and Identity operators with example.	CO2	L2	6M
		OR			
4	a	What is Range in Python? and Write a for loop that prints numbers from 0 to 17, using range function.	CO1	L1	6M
	b	Create a Python program to display Fibonacci series.	CO1	L6	6M
		UNIT-III			
5	a	Demonstrate implementation of hierarchical inheritance in Python, with a program.	CO4	L3	6M
	b	Discuss about key word arguments with example	CO3	L2	6M
		OR			
6		What is inheritance? Illustrate types of inheritance with python code.	CO4	L2	12M
		UNIT-IV			
7	a	Write about Errors and Exception Handling in Python programming.	CO4	L3	6M
	b	Write a brief note on PIP. Explain installing packages via PIP.	CO6	L3	6M
		OR			
8	a	Explain about the import statement in modules.	CO3	L2	6M
	b	Explain Python Built-in Exceptions.	CO4	L5	6M
		UNIT-V			
9	a	What is Data Management and Object Persistence?	CO5	L1	6M
	b	Explain about colors and filled shapes.	CO4	L2	6M
		OR			
10	a	Illustrate about Command line arguments.	CO4	L3	8M
	b	Write about Dates and Times.	CO5	L3	4M

***** END *****

O.P.Code: 20ME3102	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester Supplementary Examinations August-2024

ADVANCED FLUID DYNAMICS

(Thermal Engineering)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	How would you describe the following: (i) Bernoulli's equation (ii) Three dimensional flow (iii) Laminar flow (iv) Viscous flow (v) Steady flow	CO1	L1	12M
	OR			
2	Discuss in detail about the derivation of momentum equation by using integral and differential approach	CO1	L5	12M

UNIT-II

3	Discuss in detail about the irrotational flow.	CO2	L5	12M
	OR			
4	What are the application of empirical relation to various geometries for laminar and turbulent flows and explain in detail.	CO2	L1	12M

UNIT-III

5	Explain in detail about the boundary layer equation.	CO3	L1	12M
	OR			
6	Prove the boundary layer equation.	CO3	L6	12M

UNIT-IV

7	Explain the characteristics of turbulent flow.	CO4	L1	12M
	OR			
8	Derive the governing equation for turbulent flow.	CO4	L5	12M

UNIT-V

9	Discuss about the sources of error in measurements.	CO5	L5	12M
	OR			
10	Evaluate the role of experiments in engineering with suitable examples.	CO5	L6	12M

***** END *****

O.P.Code: 20ME3112	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Supplementary Examinations August-2024
NUCLEAR ENGINEERING
(Thermal Engineering)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		What is the need for enrichment of uranium? Describe the most efficient and elaborated methods suited to produce highly enriched U^{235}.	CO1	L1	12M

OR

2	a	Explain the process of breeding with an example.	CO2	L2	6M
	b	Define the term radioactivity. Explain it with an example.	CO1	L1	6M

UNIT-II

3	a	Write the salient equations of Neutron diffusion theory.	CO2	L2	6M
	b	Mention various parameters considered in neutron transport calculations.	CO2	L2	6M

OR

4		Mention the importance of Fick's law in diffusion of Neutron.	CO2	L2	12M

UNIT-III

5		How do you find the solution for multi group diffusion equations.	CO3	L1	12M

OR

6		Classify the reactors used in nuclear power plant and explain Boiling water Reactor with a neat sketch.	CO3	L2	12M

UNIT-IV

7		Mention the significance of point kinematic equations in the nuclear Power.	CO4	L2	12M

OR

8		Write an equation for simple point Kinematics and mention the importance of each term in that.	CO4	L2	12M

UNIT-V

9		What is the need of radiation protection and also mention its standards.	CO5	L1	12M

OR

10		Discuss about the critical heat flux in reactor core.	CO5	L2	12M

***** END *****

O.P.Code: 20EE2101	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Supplementary Examinations August-2024

ELECTRIC DRIVE SYSTEMS
(Electrical and Electronics Engineeirng)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	Derive the expression for torque equation in electrical drives.	CO1	L3	12M
	OR			
2	Explain four quadrant operation of motor drive system with hoist load.	CO1	L4	12M

UNIT-II

3	Derive the load equation of motor in electric drive system.	CO2	L4	12M
	OR			
4	How a phase does locked loop speed control schemes operate? Where do you use it?	CO2	L5	12M

UNIT-III

5	Design a current controller of DC Motor Drive.	CO3	L3	12M
	OR			
6	Explain the Dynamic simulation of speed controlled DC motor Drive.	CO3	L3	12M

UNIT-IV

7	Describe the speed control of Inverter-Driven induction motor.	CO4	L2	12M
	OR			
8	What is the principle of vector control and explain the direct vector control scheme.	CO4	L2	12M

UNIT-V

9	Explain briefly about the construction of stepper motor.	CO5	L3	12M
	OR			
10	What are the types of electric traction services? Explain briefly.	CO5	L2	12M

***** END *****

Q.P.Code: 20EE2103 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Supplementary Examinations August-2024
ADVANCED POWER ELECTRONIC CIRCUITS
(Power Electronics)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		What are the operating modes of basic series inverter.	CO1	L1	12M
		OR			
2		Draw the circuit diagram for 1-ϕ capacitor commutated CSI with R-load and explain in detail.	CO1	L3	12M

UNIT-II

3		Explain about the operation of single phase SMR's with neat circuit diagram.	CO2	L2	12M
		OR			
4		How to correct the active power factor by using single phase boost type APFC SMR.	CO2	L3	12M

UNIT-III

5		What are the operating modes of Buck converter.	CO3	L1	12M
		OR			
6		Classify the converters based on various aspects.	CO3	L3	12M

UNIT-IV

7		Explain the modes of operation of full-bridge converter.	CO4	L3	12M
		OR			
8	a	Compare flyback converter and forward converter.	CO4	L2	6M
	b	Compare forward and half –bridge converter.	CO4	L2	6M

UNIT-V

9		Explain about parallel resonant inverter with neat circuit diagram and waveforms.	CO5	L3	12M
		OR			
10		How to control the voltage in series resonant inverter.	CO5	L2	12M

***** END *****

O.P.Code: 20EE2107	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Supplementary Examinations August-2024
STATIC VAR CONTROLLERS AND HARMONIC FILTERING
(Power Electronics)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	Explain the necessity of reactive shunt compensation in transmission system. Explain the objectives of shunt compensation.	CO1	L2	12M
	OR			
2	Explain, how series compensation can be applied effectively to damp oscillations?	CO1	L2	12M

UNIT-II

3	Explain about thyristor Controlled Series Compensators.	CO2	L2	12M
	OR			
4	Explain the concept of series capacitive compensation.	CO2	L2	12M

UNIT-III

5	Explain the operation of three phase full-wave bridge converter with neat circuit.	CO3	L2	12M
	OR			
6	Explain the transformer connection for 24- pulse operation.	CO3	L2	12M

UNIT-IV

7	Explain Three Phase Three-wire Shunt Active Filtering and their control using p-q theory and d-q modeling.	CO4	L2	12M
	OR			
8	Explain Hybrid Filtering using Shunt Active Filters.	CO4	L2	12M

UNIT-V

9	Explain about Series Active Filtering in Harmonic Isolation mode.	CO5	L2	12M
	OR			
10	Explain the Series APF in Harmonic cancellation mode.	CO5	L2	12M

***** END *****

O.P.Code: 20ME3115	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester Supplementary Examinations August-2024

AIR-CONDITIONING SYSTEM DESIGN

(Thermal Engineering)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Explain the thermodynamics of human body.	CO1	L2	12M
		OR			
2		Write the various psychometric processes? Explain any four processes with neat sketches.	CO1	L1	12M

UNIT-II

3		Discuss briefly the different types of heat loads which have to be taken into account while designing air conditioning system?	CO2	L6	12M
		OR			
4		Explain about occupant load.	CO5	L2	12M

UNIT-III

5		In air conditioning system, the inside and outside conditions are dry bulb temperature 25°C, relative humidity 50% and dry bulb temperature 40°C, wet bulb temperature 27°C respectively. The room sensible heat factor is 0.85. 50% of the room air is rejected to atmosphere and an equal quantity of fresh air added before air enters the air conditioning apparatus. If the fresh air added is 100m3/min, Determine: a. Room sensible and latent heat load b. Sensible and latent heat load due to the fresh air c. Apparatus dew point d. Humidity ratio and dry bulb temperature of air entering air conditioning apparatus. Assume by pass factor as zero, density of air as 1.2 kg/m3 at a total pressure of 1.01325 bar.	CO2	L3	12M
		OR			
6		A conference room for seating 100 persons is to be maintained at 220C DBT and 60% relative humidity. The outdoor conditions are 400C DBT and 270C WBT. The various loads in the auditorium are as follows: Sensible and latent heat loads per person, 80W and 50W respectively: lights and fans, 15000W: sensible heat gain through glass, walls, ceiling, etc., 15000W. The air infiltration is 20 m3/min and fresh air supply is 100 m3/min. Two-Third of re circulated room air and one-third of fresh air are mixed before entering the cooling coil. The by-pass factor of the coil is 0.1. Determine Apparatus Dew Point, the Grand Total Heat Load and Effective Room Sensible Heat Factor.	CO1	L3	12M

UNIT-IV

7	a	Explain in detail about fan and its types.	CO1	L2	6M
	b	Describe the types of blowers based on air flow patterns with sketches.	CO1	L1	6M
		OR			

8	a	What is dehumidification and the necessity of it? What are the common methods of dehumidification?	CO1	L1	6M
	b	Advantages and disadvantages of dehumidifying.	CO3	L4	6M

UNIT-V

9		Explain about designs of air conditioning system.	CO1	L2	12M

OR

10	a	Explain about duct design and its recommended velocities.	CO3	L2	6M
	b	Explain about Pressure drop.	CO2	L2	6M

***** END *****

O.P.Code: 20ME3101	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester Supplementary Examinations August-2024

THERMODYNAMICS AND COMBUSTION

(Thermal Eengineeting)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		An insulated gas cylinder of volume 0.1 m^3 contains air (an ideal gas) at 5000 kPa and 300 K. The valve of the cylinder is opened allowing the air to escape till air pressure in the cylinder reaches 3000 kPa. Determine the temperature of the air left in the cylinder and the mass of the air that escaped from the cylinder.	CO1	L5	12M
		OR			
2		A fuel at 25° C is burned in a well insulated steady flow combustion chamber with air that is also at 25° C. under what condition will the adiabatic flame temperature of the combustion process be a maximum.	CO1	L5	12M

UNIT-II

3	a	One kmol of octane C_8H_{18} is burned with air that contains 20 kmol of O_2.assuming the product contains only CO_2,H_2O, O_2 and N_2, determine the mol number of each gas in the products and the air-fuel ratio for this combustion process.	CO2	L5	6M
	b	How does the presence of N_2 in air affects the outcome of a combustion process. What does the dew point temperature of the product gases represent? How it is determined?	CO2	L1	6M
		OR			
4		What are the causes of incomplete combustion and what the difference betweencomplete and incomplete combustion.	CO2	L1	12M

UNIT-III

5		Liquid propane C_3H_8 enters a steady-flow combustion chamber at 25° C and 1 atm at a rate of 0.4 kg/min where it is mixed and burned with 150 percent excess air that enters the combustion chamber at 12° C. if the combustion leave at 1200 K and 1 atm, determine i) the mass flow rate of air, ii) the rate of heat transfer from the combustion chamber, and iii) the rate of entropy generation during this process. Assume T_o=25° C	CO3	L5	12M
		OR			
6		A gases fuel with 80% CH_4,15% N_2 and 5 % O_2 is burned with dry air that enters the combustion chamber at 25° C and 100 kpa. The volumetric analysis of the product on a dry basis is 3.36% CO_2, 0.09% CO, 14.91% O_2, and 81.64% N_2. Detremine the air-fuel ratio,percent theoretical air used, volume flow rate and air used to burn fuel at a rate of 1.4 kg/min.	CO3	L5	12M

UNIT-IV

7		What are the factors affects the burner efficiency and give remedial action toovercome those effects.	CO4	L1	12M
		OR			
8		Explain with neat sketch of air aspiration gas burner.	CO4	L2	12M

UNIT-V

9	a	What is mean by direct energy conversion method and classify it according totheir sources.	CO5	L1	6M
	b	Discuss in detail about PV CELL energy system and their classification.	CO5	L6	6M
		OR			
10		Describe thermo-ionic energy system with neat sketch and list out the materials used in it.	CO5	L2	12M

***** END *****