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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester Supplementary Examinations July-2025

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	a	What do you understand by term Research Problem? What are the objectives of Research Problem?	CO1	L2	6M
	b	Explain different sources of research problem by giving suitable examples under source.	CO1	L3	6M
		OR			
2	a	Elaborate on common errors committed by researchers in selecting the research problem.	CO1	L3	6M
	b	Give a detailed account on various approaches adopted by researchers in solving problems stated by them.	CO1	L4	6M

UNIT-II

3	a	Literature review helps in identifying a suitable research problem. Comment.	CO2	L4	6M
	b	Give a detailed description on maintenance of ethics in research work.	CO2	L3	6M
		OR			
4	a	"For any research to be successful it must be well designed."Justify this statement.	CO2	L5	6M
	b	Explain the significance of data collection in research. What are the various methods of data collection?	CO2	L2	6M

UNIT-III

5	a	Discuss the importance of critical literature review and its uses in planning innovation research.	CO3	L3	6M
	b	How do you go about formulating research problem? How do you organize your research work?	CO3	L2	6M
		OR			
6	a	What is technical writing? What tools do technical writers use?	CO3	L2	6M
	b	What is report writing? What is the significance of report writing?	CO3	L2	6M

UNIT-IV

7	a	Discuss Radical Innovation and Incremental Innovation by quoting real time examples.	CO4	L3	6M
	b	Discuss the significance of Intellectual Property rights in modern day context.	CO4	L4	6M
		OR			
8	a	What is patent? How to obtain patent?	CO4	L3	6M
	b	What is the difference between copyrights, trademarks and patents?	CO4	L3	6M

UNIT-V

9	a	What does it mean to "Licence a Patent" and why is it done?	CO5	L3	6M
	b	Why should I care about patent information? Where can I find patent information?	CO5	L4	6M
		OR			
10	a	Explain the geographical indications of patent Rights.	CO5	L2	6M
	b	What are the new developments in IPR with respect to the administration of patent system? Explain in detail.	CO5	L3	6M

***** END *****

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester Supplementary Examinations July-2025

ADVANCED DATA STRUCTURES

(Computer Science & Engineering)

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

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

UNIT-I

1	a	How to implement dictionaries? Explain.	CO1	L3	6M
	b	Describe the process to implement Abstract Data Type.	CO1	L2	6M

OR

2		Define Hashing. Explain Hash Functions with suitable example.	CO1	L4	12M

UNIT-II

3		List out the different data structures and algorithms of randomizing.	CO2	L3	12M

OR

4		Define skip list and explain skip list structure.	CO2	L4	12M

UNIT-III

5	a	List and explain different string operations in c++.	CO3	L3	6M
	b	Calculate with example Running time analysis of KMP algorithm.	CO3	L2	6M

OR

6		Explain text processing advantage and disadvantage of Standard Tries.	CO3	L4	12M

UNIT-IV

7		Construct a problem for clustered model with 2-dimensional range searching.	CO4	L3	12M

OR

8	a	Explain one dimensional range searching in static and dynamic way.	CO4	L4	6M
	b	Define range searching and find the general time complexity.	CO4	L2	6M

UNIT-V

9		Explain Decision Trees for Geometric Models with some model.	CO5	L3	12M

OR

10		Discuss about message digest and password verification.	CO5	L4	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 July-2025
PYTHON PROGRAMMING
(Computer Science & Engineering)

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

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

		UNIT-I			
1	a	Justify the REPL in python?	CO1	L5	6M
	b	Define Variable and mention rules for choosing names of Variable with example.	CO1	L1	6M
		OR			
2	a	Illustrate the input and output statements with example.	CO1	L2	6M
	b	Implement the python program to calculate total and average marks based on input.	CO1	L3	6M
		UNIT-II			
3	a	Classify various types of operators in Python and write any 4 types of operators.	CO2	L2	6M
	b	List different conditional statements in python with appropriate examples.	CO2	L1	6M
		OR			
4	a	Discuss the Membership and Identity operators with example.	CO2	L2	6M
	b	Write a python program to find biggest number among three numbers.	CO2	L3	6M
		UNIT-III			
5	a	Describe about default arguments with suitable program.	CO3	L2	6M
	b	Create recursive function to find factorial of a number.	CO3	L5	6M
		OR			
6	a	Illustrate lambda function with example.	CO3	L3	6M
	b	Discuss about key word arguments with example.	CO3	L2	6M
		UNIT-IV			
7	a	What is Module in Python? Explain, how can you use Modules in your program explain with an example code.	CO4	L5	6M
	b	Write a brief note on PIP. Explain installing packages via PIP.	CO4	L3	6M
		OR			
8	a	Describe the types of namespaces in Python?	CO4	L2	6M
	b	Explain about the from import statement in modules.	CO4	L5	6M
		UNIT-V			
9	a	Discuss about maps in python.	CO6	L2	6M
	b	Discuss about filters in python.	CO6	L2	6M
		OR			
10	a	Illustrate about Command line arguments.	CO4	L3	6M
	b	Explain about the reading files in python.	CO2	L2	6M

***** END *****

O.P.Code: 23ME3112	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester Supplementary Examinations July-2025

NUCLEAR ENGINEERING

(Thermal Engineering)

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

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

UNIT-I

1	a	What is chain reaction? What is the difference between controlled and uncontrolled chain reaction?	CO1	L1	6M
	b	Which types of neutrons are most suitable for chain reaction? Why.	CO1	L1	6M
		OR			
2	a	How to control the nuclear power generation?	CO1	L2	6M
	b	Explain in brief how uranium material is produced from thorium.	CO1	L2	6M

UNIT-II

3	a	Mention various parameters considered in neutron transport calculations	CO2	L1	6M
	b	What do you mean by the following (i) Elastic Scattering (ii) Inelastic Scattering (iii) Capture (iv) Fission	CO2	L2	6M
		OR			
4	a	How do you make the neutrons slow Mention the importance of Fick's law in diffusion of Neutron.	CO2	L1	6M
	b	Explain about Elastic Collision.	CO2	L2	6M

UNIT-III

5	a	Find solution for diffusion equations for a particular region.	CO3	L3	6M
	b	Why thermal reactors are more crucial in power generation.	CO3	L1	6M
		OR			
6	a	Mention the special features of Fast breeder reactor.	CO3	L2	6M
	b	With a neat sketch explain the working of Sodium-Graphite reactor.	CO3	L3	6M

UNIT-IV

7	a	Radioactive materials are more dangerous to human beings. Justify.	CO4	L1	6M
	b	What is the future of nuclear power?	CO4	L2	6M
		OR			
8		Mention the importance of point kinematics and the factors which affect Them.	CO4	L1	12M

UNIT-V

9		Discuss about the critical heat flux in reactor core.	CO5	L2	12M
		OR			
10		How reactors are useful in defense. Explain.	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 July-2025

AIR CONDITIONING SYSTEM DESIGN

(Thermal Engineering)

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

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

UNIT-I

1		List out various psychometric processes? Explain any four processes with neat sketches.	CO1	L2	12M
		OR			
2	a	What is comfort chart and how they are used.	CO1	L2	6M
	b	Discuss the factors affecting optimum effective temperature.	CO1	L2	6M

UNIT-II

3		Discuss briefly the different types of heat loads which have to be taken into account while designing an air conditioning system.	CO2	L2	12M
		OR			
4	a	Define the terms; i) Latent heat ii) Sensible heat iii) Sensible heat factor	CO2	L2	6M
	b	The amount of air supplied to an air conditioned hall is 300 m^3/min. The atmospheric conditions are 35°C DBT and 55% RH. The required conditions are 20°C DBT and 60% RH. Find out the sensible heat and latent heat removed from the air per minute. Also find sensible heat factor for the system.	CO2	L3	6M

UNIT-III

5	a	Explain the method of drawing RSHF and GSHF lines on psychrometric chart.	CO3	L2	6M
	b	A room has a sensible heat gain of 24 kW and a latent heat gain of 5.2 KW and it has to be maintained at 26°C DBT and 50% RH. 180m^3/min of air is delivered to the room. Determine the state of supply air.	CO3	L3	6M
		OR			
6		A conference room for seating 100 persons is to be maintained at 22^{0}C DBT and 60% relative humidity. The outdoor conditions are 40^{0}C DBT and 27^{0}C 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 m^3/min and fresh air supply is 100 m^3/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 HeatLoad and Grand Sensible Heat Factor.	CO3	L3	12M

UNIT-IV

7	a	Explain the differences between grilles, registers and diffusers	CO4	L2	6M
	b	What is meant by a register? Explain the factors affecting grill Performance.	CO4	L2	6M
		OR			
8	a	What is the necessity of dehumidification in air-conditioning? Explain the common methods adapted for dehumidification.	CO4	L2	6M
	b	Write the advantages and disadvantages of humidification in air-conditioning systems?	CO4	L2	6M

UNIT-V

9		What are the different air distribution methods and when would each be most appropriate?	CO5	L2	12M
		OR			
10	a	Explain the static regain method of duct design.	CO5	L2	6M
	b	Explain the velocity reduction method of duct design.	CO5	L2	6M

***** END *****

Q.P.Code: 20ME3101 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Supplementary Examinations July-2025
THERMODYNAMICS AND COMBUSTION
(Thermal Engineering)

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 m3 contains air (an ideal gas) at 5000 kPa and 300 K. The valve of the cylinder is opened allowing the air to escape till the 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		Steam at a pressure of 2000 kPa and 500 C is flowing in a pipe. An evacuated tank is connected to this pipe through a valve. The valve is opened and the tank is filled with steam until the pressure is 2000 kPa (line pressure), and then the valve is closed. The process takes place adiabatically and the kinetic energy and potential energy changes can be assumed negligible. Determine the temperature of the steam in the tank at the end of the filling operation.	**CO1**	**L5**	**12M**

UNIT-II

3	**a**	A certain natural gas has following volumetric analysis: 65 percent CH_4, 8 percent H_2, 18 percent N_2, 3 percent O_2 and 6 percent CO_2. This gas is now burnt completely with the stoichiometric amount of dry air. What is the air-fuel ratio for this combustion process.	**CO2**	**L1**	**6M**
	b	Ethane C_2H_6 is burned with 20% excess air during a combustion process. Assuming complete combustion and a total pressure of 100 kpa, determine air fuel ratio,dew point temperature of the product.	**CO2**	**L5**	**6M**
		OR			
4		What are the causes of incomplete combustion and what the difference between complete and incomplete combustion. What is the air-fuel ratio? How is it related to the fuel air ratio.	**CO2**	**L1**	**12M**

UNIT-III

5	Liquid propane C_3H_8 enters a steady-flow combustion chamber at 25 deg 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 deg C. If the combustion leave at 1200k 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 deg C.	**CO3**	**L5**	**12M**

OR

6	Two kmol of octane C_8H_{18} is burned with air that contains 20kmol 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.	**CO3**	**L5**	**12M**

UNIT-IV

7	Design an burner which uses oil as a fuel and the flow rate of oil is 12.5ml per minute.	**CO4**	**L6**	**12M**

OR

8	What is mean by atomizing burner? Explain its working with neat sketch.	**CO4**	**L2**	**12M**

UNIT-V

9	Describe about seeback effect and explain with neat sketch about thermo-electric energy system.	**CO4**	**L2**	**12M**

OR

10	Discuss in detail about contribution of direct energy conversion system in the field power sector with their advantage and disadvantages.	**CO4**	**L6**	**12M**

***** END *****