O.P.Code: 20CS0517	R20	H.T.No.										

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

DATA WAREHOUSING AND DATA MINING

(Common to CAD, CSE & CSIT)

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

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

UNIT-I

1	a	Define Data mining. What are all points to be discussed to motivated at a mining?	CO1	L1	6M
	b	Explain Data mining as a step in the process of knowledge discovery.	CO1	L2	6M
		OR			
2	a	Classify different data pre-processing techniques used to improve the overall quality of the mined data.	CO1	L2	6M
	b	What is data cleaning? Describe in detail the different methods for data Cleaning.	CO1	L1	6M

UNIT-II

3	a	Discuss in detail about different types of Data Warehousing.	CO2	L6	6M
	b	Distinguish between OLTP and OLAP.	CO2	L2	6M
		OR			
4		Analyze the OLAP operation in multidimensional data.	CO2	L4	12M

UNIT-III

5		Explain about Apriori Algorithm with an example.	CO4	L2	12M
		OR			
6		Make use of the database which has five transactions. Let minimum support=60% and minimum confidence=80%.	CO4	L3	12M

Transaction	Items
T10	M, O, N, K, E, Y
T20	D, O, N, K, E, Y
T30	M, A, K, E
T40	M, U, C, K, Y
T50	C, O, O, K, I, E

Find all frequent itemsets using FP-growth.

UNIT-IV

7		Discuss the following terms i) Gini Index ii) Gain ratio iii) Information Gain	CO5	L2	12M
		OR			
8	a	Discuss about Rule based Classification method.	CO5	L2	6M
	b	Define Neural Network. Explain the Classification by Back Propagation.	CO5	L1	6M

UNIT-V

9		Explain K-Means and K-Medoids partitioning methods in detail.	CO6	L2	12M
		OR			
10	a	Discuss the key issues in hierarchical clustering algorithm.	CO6	L2	4M
	b	How clusters are identified using DBSCAN algorithm?	CO6	L1	8M

***** END *****

O.P.Code: 20CS1202	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

MOBILE APP DEVELOPMENT

(CSE with Specialization in Cloud Computing)

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

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

UNIT-I

1		Illustrate Android Architecture with neat sketch.	CO1	L1	12M
		OR			
2	a	What is AVD? Explain AVD in android with pros and cons.	CO1	L1	6M
	b	What is manifest? Write application of manifest.	CO1	L1	6M

UNIT-II

3		Discuss screen adapting to display orientation.	CO2	L1	12M
		OR			
4	a	Explain the following List View.	CO2	L3	6M
	b	Explain the following Image View.	CO2	L3	6M

UNIT-III

5		Define SQLite database? How to provide database connection using SQLite database.	CO1	L1	12M
		OR			
6		What is Content Provider? What are the Operations supported by a Content Provider?	CO1	L1	12M

UNIT-IV

7		How can we send SMS messages in your Android application.	CO1	L1	12M
		OR			
8		Explain in detail about Timer Class in Android.	CO1	L1	12M

UNIT-V

9		Explain the UI Design Guidelines for Windows Phone 8.	CO1	L1	12M
		OR			
10		Design and Illustrate the display of maps with landmarks and location.	CO4	L4	12M

***** END *****

O.P.Code: 20CS0904	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

INTRODUCTION TO MACHINE LEARNING

CSE(Artificial Intelligence and Machine Learning)

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

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

UNIT-I

1	a	What is the role of pre-processing of data in machine learning? Why it is needed?	CO1	L3	6M
	b	Analyze Reinforcement Learning with neat diagram.	CO1	L4	6M
		OR			
2		Discuss the Machine Learning techniques with neat diagrams.	CO1	L2	12M
		UNIT-II			
3	a	Describe about Multivariate Tree prediction.	CO2	L1	6M
	b	Describe about Univariate Tree prediction.	CO2	L1	6M
		OR			
4		Explain about machine learning classification and its usage.	CO2	L2	12M
		UNIT-III			
5		Describe a) Feed Forward Neural Networks. b) Recurrent Neural Networks. c) Convolutional Neural Networks.	CO3	L1	12M
		OR			
6	a	Describe Bayesian decision classifier.	CO3	L2	6M
	b	Explain linear discriminant analysis.	CO3	L2	6M
		UNIT-IV			
7		Explain Bayesian decision theory in detail.	CO4	L2	12M
		OR			
8	a	Write about bias and variance?	CO4	L3	6M
	b	Describe the Bernoulli density. Give an example.	CO4	L2	6M
		UNIT-V			
9	a	Write about multivariate methods.	CO5	L2	6M
	b	Write the applications of multivariate normal distribution.	CO5	L2	6M
		OR			
10	a	List the features of multivariate normal distribution.	CO5	L2	6M
	b	Write some features of multivariate normal distribution.	CO5	L2	6M

***** END *****

O.P.Code: 20CS1003	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
PRINCIPLES OF CYBER SECURITY
CSE (Internet of Things and Cyber security Including Block Chain Technology)

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

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

		UNIT-I			
1		Explain about Information Security Management in detail.	**CO1**	**L1**	**12M**
		OR			
2		What is cybercrime? Explain the classification of cybercrimes.	**CO1**	**L1**	**12M**
		UNIT-II			
3		Discuss the classes of Attacks.	**CO2**	**L6**	**12M**
		OR			
4	**a**	What is CTI and its types?	**CO2**	**L2**	**6M**
	b	Explain Malware and Phishing.	**CO2**	**L6**	**6M**
		UNIT-III			
5		Explain Identity and Access Management in Cyber security.	**CO3**	**L6**	**12M**
		OR			
6	**a**	Why is digital data security important?	**CO3**	**L1**	**6M**
	b	What are the different types of digital security?	**CO3**	**L3**	**6M**
		UNIT-IV			
7	**a**	Examine Web threats for organization in detail.	**CO4**	**L1**	**6M**
	b	List out few roles of Cyber Threats.	**CO4**	**L6**	**6M**
		OR			
8		Difference between vulnerability management and vulnerability assessment.	**CO4**	**L3**	**12M**
		UNIT-V			
9		How to protect your device from Backdoor Attacks?	**CO5**	**L2**	**12M**
		OR			
10	**a**	What is Metasploit?	**CO5**	**L2**	**6M**
	b	What are the Inferences of Digital Signature in Cyber security?	**CO5**	**L6**	**6M**

***** END *****

O.P.Code: 20CE0120	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

TRANSPORTATION ENGINEERING

(Civil Engineering)

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

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

UNIT-I

1	a	Write the basic requirements and factors controlling for ideal alignment between two terminal stations.	CO1	L1	6 M
	b	What are the engineering surveys conducted to fix the alignment of a highway?	CO1	L2	6 M
		OR			
2	a	List the Factors affecting OSD. Explain Lag distance and Braking distance along with formulas.	CO1	L1	6 M
	b	Enumerate the factors governing the width of carriage way.	CO1	L2	6 M
		UNIT-II			
3	a	Expand PCU and Give Equivalent PCU for atleast two classes of vehicles.	CO2	L2	6 M
	b	Give the classification of road markings?	CO2	L2	6 M
		OR			
4	a	Define 'Optimum Cycle Time' used in Signal Design by Webster method.	CO2	L2	6 M
	b	What is the relationship between speed and Flow?	CO2	L2	6 M
		UNIT-III			
5		Draw a sketch of flexible pavement cross section and show the component parts. Enumerate the functions and importance of each component of the pavement.	CO3	L2	12 M
		OR			
6		What are the factors should be considered for the design of flexible and rigid pavements Discuss the significance of each.	CO4	L2	12 M
		UNIT-IV			
7	a	Explain the concept of creep using percussion theory.	CO5	L2	6 M
	b	efine creep in the rails. Explain various causes of creep.	CO5	L2	6 M
		OR			
8	a	Draw a typical cross section of permanent way and show various components.	CO5	L2	6 M
	b	What are the different types of rails used? Explain the concept of Adzing of sleepers and Discuss about methods of rectifying creep?	CO5	L2	6 M
		UNIT-V			
9	a	What is cant deficiency? Discuss briefly about the limits of cant deficiency.	CO6	L2	6 M
	b	Discuss about the requirement of passenger platforms.	CO6	L2	6 M
		OR			
10	a	Draw a neat sketch of Left hand turnout and show various parts of turnout.	CO6	L2	6 M
	b	Explain briefly about cant with equilibrium equation.	CO6	L2	6 M

***** END *****

O.P.Code: 20EC0416	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

MICROPROCESSORS & MICROCOMPUTERS

(Electronics & Communications Engineering)

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

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

UNIT-I

1	a	Draw the block diagram of output section of Microcomputer . Describe the role of tristate bus driver, decoder and latch.	CO1	L4	6M
	b	Explain how memory addresses are assigned to a memory chip of size 1K(1024X8).	CO2	L2	6M
		OR			
2	a	Explain the difference between the peripheral I/O and memory mapped I/O.	CO2	L3	6M
	b	How computers are classified? Explain in brief.	CO1	L2	6M
		UNIT-II			
3	a	Discuss conditional jump and un conditional jump instruction with an example.	CO3	L2	6M
	b	Draw the flag register of the 8085 microprocessor and explain each bit in detail.	CO2	L2	6M
		OR			
4	a	Draw the pin diagram of the 8085 microprocessor and categorize the pins based on function.	CO2	L4	8M
	b	Discuss the different types of registers used in the 8085 microprocessors.	CO2	L2	4M
		UNIT-III			
5	a	Draw the pin diagram of 8051 microcontroller and describe the functionality of each pin in detail.	CO3	L4	8M
	b	Describe the functions of PCON and SCON in the 8051 microcontroller.	CO2	L2	4M
		OR			
6	a	Draw the internal architecture of 8051 microcontroller and explain the function of each block present in it.	CO3	L2	8M
	b	Draw the formats for IP and TCON register. 8051Mc.	CO3	L2	4M
		UNIT-IV			
7	a	Discuss the following instructions of 8051microcontroller with an example. (i) Bit-level logical operations (ii)Byte level logical operations.	CO4	L2	8M
	b	List various incrementing and decrementing instructions with examples in 8051 microcontroller.	CO4	L1	6M
		OR			
8	a	List out the any five instructions for immediate addressing modes and indirect addressing modes with suitable example.	CO4	L2	6M
	b	Explain any three arithmetic operations Instructions of 8051 microcontroller with an example.	CO	L4	6M
		UNIT-V			
9	a	List out the types of led displays and draw the seven-segment display circuit used for SVNSEG program.	CO5	L3	6M
	b	Explain and draw the scanning keyboards and it configuration.	CO5	L2	6M
		OR			
10	a	Draw diagram and explain the D/A converter circuit.	CO5	L4	6M
	b	List any five advantages of A/D converter and it applications	CO5	L1	6M

***** END *****

O.P.Code: 20CI0605	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
SOFTWARE ENGINEERING &TESTING
(Computer Science & Information Technology)

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 software development life cycle? Why it is important to while developing a software product?	CO1	L1	6M
	b	Describe the rapid application development (RAD) model. Discuss each phase in detail.	CO1	L5	6M
		OR			
2		Explain in detail the following software metrics with example. i) Design Metrics ii) Data structure Metrics	CO1	L3	12M

UNIT-II

3	a	What is COCOMO Model? Explain Basic COCOMO model in detail.	CO2	L2	6M
	b	Suppose that a project was estimated to be 400 KLOC. Calculate the effort , development time for each of the three modes (i.e., organic, semidetached and embedded and analyze.	CO2	L6	6M
		OR			
4	a	Explain Software Prototyping in software engineering	CO2	L3	6M
	b	Model a Dataflow diagram for a "Library Management System". State and explain the functional requirements you are considering.	CO2	L6	6M

UNIT-III

5	a	Discuss the difference between object-oriented designs and function oriented design.	CO3	L4	6M
	b	What is modularity? List the important properties of a modular system.	CO3	L1	6M
		OR			
6		Discuss the basic model of software reliability. How $\Delta\mu$ and $\Delta\tau$ can be calculated.	CO3	L2	12M

UNIT-IV

7		Discuss various types of functional testing techniques.	CO4	L2	12M
		OR			
8		Elaborate various types of structural testing technique.	CO4	L5	12M

UNIT-V

9		Discuss Reverse engineering and Re-engineering in detail.	CO5	L2	12M
		OR			
10	a	Classify different categories of software documentation.	CO5	L2	6M
	b	Compare New software development and Re-engineering.	CO5	L4	6M

***** END *****

Q.P.Code: 20CS0518	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

SOFTWARE ENGINEERING

(Common to CAD, CSE, CCC, CAI, CIC, CSM)

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

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

		UNIT-I			
1	a	What is Software Process? Distinguish any two Process Models.	CO1	L4	6M
	b	How Process framework is created for software? Explain.	CO1	L2	6M
		OR			
2	a	Who is Scrum Master? What is his/her role in Scrum Model. Explain with a neat diagram.	CO1	L2	6M
	b	Write a note on Agile Unified Process.	CO1	L1	6M
		UNIT-II			
3	a	How to establish the groundwork for understanding of software requirements. Explain the steps in it.	CO2	L2	6M
	b	Illustrate Eliciting Requirements and narrate the steps in detail.	CO2	L3	6M
		OR			
4	a	Explain in detail about Data Modeling Concepts.	CO2	L2	6M
	b	Differentiate Behavioral Model Vs Structural Model.	CO2	L4	6M
		UNIT-III			
5	a	Explain common characteristics in the evolution of software design.	CO3	L2	6M
	b	Identify Design patterns. What is the intent of each design pattern.	CO3	L3	6M
		OR			
6	a	Distinguish between Analysis Model and Design Model.	CO3	L5	6M
	b	Write down the steps in refining the Architecture into Components.	CO3	L2	6M
		UNIT-IV			
7	a	Express the rules of User Interface Design.	CO4	L2	6M
	b	Organize the steps involved in WebApp Interface Design.	CO4	L4	6M
		OR			
8	a	Examine the elements of component level design.	CO4	L3	6M
	b	Explain in detail about Aesthetic design.	CO4	L2	6M
		UNIT-V			
9	a	What is Software Testing? Why it is important before deploying the software.	CO5	L5	6M
	b	Explain about the importance of test strategies in conventional software.	CO5	L2	6M
		OR			
10	a	Difference between Alpha and Beta testing.	CO5	L4	6M
	b	Describe interclass test case design.	CO5	L2	6M

***** END *****

O.P.Code: 20EE0216	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
ELECTRICAL MEASUREMENTS AND INSTRUMENTATION
(Electrical & Electronics Engineering)

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

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

UNIT-I

1		What are the different types of damping systems? Explain them with neat diagram.	CO1	L3	12M
		OR			
2	a	Illustrate the construction and working of permanent magnet moving coil instruments.	CO1	L3	6M
	b	List the advantages and disadvantages of PMMC type instruments.	CO1	L3	6M

UNIT-II

3		Explain classification of resistances. What are the different types of methods used for measurement of low, medium and high resistance?	CO2	L3	12M
		OR			
4	a	Explain the construction and working of Anderson Bridge with suitable diagrams.	CO2	L3	6M
	b	Draw the circuit diagram of a Wheatstone bridge and derive the condition for balance.	CO2	L3	6M

UNIT-III

5	a	Explain stray magnetic field errors in electro dynamometer type wattmeter.	CO3	L3	6M
	b	Derive the torque equation for single phase induction type energy meter.	CO3	L3	6M
		OR			
6		With a neat construction diagram, explain the operation of single phase induction type energy Meters	CO3	L3	12M

UNIT-IV

7		Draw the phasor diagram of PT. Derive the expression for its transformation ratio and phase angle errors.	CO4	L3	12M
		OR			
8	a	Describe the construction and working of LVDT with a neat schematic.	CO4	L3	6M
	b	Explain the principle of operation of strain gauge and gauge factor.	CO4	L3	6M

UNIT-V

9		Derive the eqution of motion of balastic galvanometer.	CO5	L3	12M
		OR			
10		Describe briefly how the following measurements can be made with the use of CRO (i) Frequency. (ii) Phase angle. (iii) Voltage.	CO5	L3	12M

***** END *****

O.P.Code: 20ME0316	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

METAL CUTTING AND MACHINE TOOLS

(Mechanical Engineering)

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

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

		UNIT-I			
1	a	Define the following terms a) „Metal cutting" b) Cutting ratio.	CO1	L1	6M
	b	Derive an equation for chip thickness ratio and shear plane angle.	CO1	L3	6M
		OR			
2	a	What are the conditions for producing continuous chips?	CO1	L1	6M
	b	During orthogonal cutting a bar of 90mm diameter is reduced to 87m. If the mean length of the cut is 88.2mm and rake angle is 15°. Calculate: (i) Cutting ratio (ii) Shear angle.	CO1	L3	6M
		UNIT-II			
3	a	List various forces acting on a chip.	CO2	L1	6M
	b	Define cutting speed, feed and depth of cut.	CO2	L2	6M
		OR			
4	a	What are the characteristics of an ideal cutting tool material?	CO2	L1	6M
	b	List out the types of cutting tool material and explain (i) Coronite (ii) Ucon.	CO2	L2	6M
		UNIT-III			
5	a	Define the working principle of lathe. How the lathe is specified?	CO3	L1	6M
	b	Name five work holding devices and explain them in brief.	CO4	L2	6M
		OR			
6	a	Identify the common tools and attachments used on Turret and Capstan lathes.	CO3	L1	6M
	b	List the Turret lathe operations and explain any one operation with neat sketch.	CO4	L2	6M
		UNIT-IV			
7	a	Define the terms "Drilling" and „Drill"	CO5	L1	6M
	b	Name the different types of the drilling machines. How the drilling machine specified?	CO5	L2	6M
		OR			
8	a	Write short notes on (i) Face milling (ii) Straddle milling and (iii) End milling operations.	CO5	L1	6M
	b	Explain briefly plain indexing and differential indexing with suitable example.	CO5	L2	6M
		UNIT-V			
9	a	Define the terms i) Grinding ii) Rough grinding and iii) Precision grinding.	CO6	L1	6M
	b	What is grinding and types of grinding?	CO6	L2	6M
		OR			
10	a	Compare the center and center-less grinding machine.	CO6	L1	6M
	b	What are the advantages, limitations and applications of broaching?	CO6	L2	6M

***** END *****

O.P.Code: 20CS0533	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
CYBER SECURITY
(Computer Science & Information Technology)

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

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

UNIT-I

1	a	What is information security?	CO1	L1	3M
	b	Explain the objectives of Information Security Management in detail.	CO1	L2	9M
		OR			
2		Illustrate Cybercrimes Cases of Various Categories under IPC Section.	CO1	L3	12M

UNIT-II

3	a	Discuss about Attack surface.	CO2	L2	6M
	b	What is Cloud Computing? Classify the types in it and list the advantages.	CO2	L4	6M
		OR			
4	a	Define the botnet.	CO4	L1	2M
	b	Show how botnet is created and brief its usage with clear description.	CO4	L1	10M

UNIT-III

5	a	Discuss various threats on mobile or cell phones.	CO3	L2	6M
	b	Compare Mishing, Smishing and Vishing in detail.	CO3	L5	6M
		OR			
6		Discuss organizational measures for handling the mobile devices.	CO3	L2	12M

UNIT-IV

7	a	Justify various tools used in cybercrime attack.	CO4	L5	6M
	b	Classify different techniques used in cybercrime.	CO4	L4	6M
		OR			
8	a	What are back doors? Explain how back doors are used to attack information.	CO5	L2	6M
	b	Give definition of stenography. Discuss the stenography with example.	CO4	L1	6M

UNIT-V

9	a	What are the security risks in cyber security explain them.	CO5	L1	6M
	b	Distinguish proactive and reactive approach to security.	CO5	L5	6M
		OR			
10		Examine Web threats for organization in detail.	CO6	L4	12M

***** END *****

O.P.Code: 20CS0537	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
CLOUD COMPUTING
CSE(Artificial Intelligence & Data Science)

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

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

UNIT-I

1	a	Define cluster computing.	CO1	L1	2M
	b	Discuss in detail about clusters of cooperative computers with neat diagram.	CO1	L2	10M

OR

2	a	What is SOA? Describe with its architecture.	CO1	L2	6M
	b	Explain the Cloud Computing Stack.	CO1	L2	6M

UNIT-II

3	a	Analyze the Public Cloud and Private Cloud.	CO2	L4	6M
	b	Write Short note on Hybrid Cloud.	CO2	L1	6M

OR

4		Illustrate the Life Cycle of Service Level Agreement with neat diagram	CO2	L3	12M

UNIT-III

5	a	What do you understand by Virtualization?	CO3	L1	4M
	b	Explain in detail different implementation level of virtualization.	CO3	L2	8M

OR

6	a	Summarize the Memory Virtualization concept.	CO3	L2	6M
	b	Illustrate I/O Virtualization with an example.	CO3	L3	6M

UNIT-IV

7		Discuss the following in detail: i) Network Level Security ii) Host Level Security iii) Application Level Security.	CO4	L2	12M

OR

8	a	Analyze the aspects of data security.	CO4	L2	6M
	b	Explain about provider data and its security.	CO4	L2	6M

UNIT-V

9	a	List and describe Benefits of mobile cloud computing.	CO5	L1	6M
	b	Discuss the context management architecture based on IRNA with neat diagram.	CO5	L2	6M

OR

10	a	Describe the following: i) Offloading in static environment ii) Offloading in dynamic environment	CO5	L2	8M
	b	List out the applications of mobile cloud computing.	CO5	L1	4M

*** END ***

O.P.Code: 20CS0901	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

(CSE with Specialization in Cloud Computing)

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

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

		UNIT-I			
1	a	Define AI. How it is organized? Explain the categories of it in detail.	CO1	L1	6M
	b	Discuss the following terms: i)Systems that think like humans ii)Systems that act like humans	CO1	L2	6M
		OR			
2	a	Explain the role of AI in Online Fraud Detection and Self-driving cars	CO1	L2	6M
	b	What are the capabilities of a computer in terms of AI.	CO1	L1	6M
		UNIT-II			
3	A	Analyze the Blind Search and its Types? Explain any two in detail with example.	CO2	L4	12M
		OR			
4	a	Discuss in detail A* Search and IDA* Search with an example.	CO2	L4	6M
	b	Justify why Greedy Best First Search in is not an optimal searching technique.	CO2	L5	6M
		UNIT-III			
5	a	Discuss about "Resolution in Propositional Logic" and explain with an example.	CO3	L2	6M
	b	Express Tautologies and Contradictions with Truth tables.	CO3	L2	6M
		OR			
6	a	How effectively Propositional Calculus is used in AI? Explain.	CO4	L2	6M
	b	Prove $\alpha : (P \wedge Q \rightarrow R) \wedge (\sim P \rightarrow S) \wedge Q \wedge \sim R \wedge \sim S$ is inconsistent using tableaux method.	CO4	L5	6M
		UNIT-IV			
7	a	How representations and Mappings in KR is done? Explain.	CO5	L2	6M
	b	Describe the approaches to Knowledge Representation.	CO5	L2	6M
		OR			
8	a	List the set of primitives and conceptual tenses used in Conceptual Dependency.	CO5	L1	6M
	b	Explain four knowledge representation techniques	CO5	L2	6M
		UNIT-V			
9	a	What do you mean by expert system technology? Explain.	CO6	L1	6M
	b	Distinguish between forward chaining and backward chaining	CO6	L2	6M
		OR			
10	a	What is Rule-based Systems? How Forward Chaining and BackwardChaining is used in Rule-based System.	CO6	L1	6M
	b	Distinguish Model-based Expert system Vs Case based expert system.	CO6	L2	6M

***** END *****

O.P.Code: 20CS0531	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
SOFT COMPUTING
(Common to CSE,CSM & CAI)

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

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

		UNIT-I			
1	**a**	Illustrate the basic components of Artificial Intelligence and itsapplications.	**CO1**	**L3**	**8M**
	b	Compare Soft computing and Hard computing.	**CO1**	**L5**	**4M**
		OR			
2		Summarize the following terms: i) Fuzzy Systems ii) Genetic Algorithm	**CO1**	**L5**	**12M**
		UNIT-II			
3	**a**	Explain Hamming neural network with neat diagram.	**CO2**	**L2**	**6M**
	b	Explain Max network with architecture.	**CO2**	**L2**	**6M**
		OR			
4		Summarize the following i)Feed forward phase in BPNN ii) Back propagation Error iii) Updation of weight and bias in BPNN.	**CO2**	**L2**	**12M**
		UNIT-III			
5		Explain the various types of operations and properties(now added) on Fuzzy Sets with examples.	**CO3**	**L2**	**12M**
		OR			
6	**a**	Compare Mamdani FIS and Sugeno FIS.	**CO3**	**L5**	**6M**
	b	Demonstrate the Fuzzy Decision Making briefly.	**CO3**	**L3**	**6M**
		UNIT-IV			
7		Define the Genetic algorithm with basic terminologies and illustrate theworking principle of Genetic Algorithm.	**CO4**	**L3**	**12M**
		OR			
8	**a**	Draw the flow chart for the working principle of Genetic Algorithm. Explain it.	**CO4**	**L2**	**6M**
	b	Briefly explain Convergence of Genetic Algorithm.	**CO4**	**L2**	**6M**
		UNIT-V			
9	**a**	List out the various types of hybrid systems.	**CO5**	**L1**	**4M**
	b	Explain the basic categories of Hybrid system with neat architectures.	**CO5**	**L3**	**8M**
		OR			
10	**a**	Explain various Soft Computing Tools.	**CO5**	**L2**	**6M**
	b	Compare sequential , auxillary and embedded hybrid systems.	**CO5**	**L5**	**6M**

***** END *****

O.P.Code: 20CS1011	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
CRYPTO CURRENCY & INTRODUCTION TO BLOCKCHAIN TECHNOLOGY
CSE (Internet of Things and Cyber security Including Block Chain Technology)

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

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

UNIT-I

1	a	Define Distributed Database? Explain it types.	CO1	L1	6M
	b	Write short notes on Turing Complete.	CO1	L3	6M

OR

2		What is Hash Function in cryptography?Write Features of Hash functions.	CO1	L4	12M

UNIT-II

3		What is Blockchain? Explain.	CO2	L2	12M

OR

4	a	Explain about the need of block chain.	CO2	L5	6M
	b	Describe the gas limit concept in detail	CO2	L6	6M

UNIT-III

5		Compare Proof-of-work and Proof-of-stake?	CO3	L3	12M

OR

6	a	How the Bitcoin network prevents sybil attack?	CO3	L1	6M
	b	What are the ways to prevent sybil attack?	CO3	L1	6M

UNIT-IV

7		Define Cryptocurrency.Explain the features of cryptocurrency.	CO4	L1	12M

OR

8	a	What are the attacks in cryptocurrency?	CO4	L1	6M
	b	Write a short notes on sidechain and namecoin.	CO4	L3	6M

UNIT-V

9		Explain about roots of Bitcoin.	CO5	L2	12M

OR

10		What are the legal aspects in cryptocurrency?Explain.	CO5	L1	12M

*** END ***

O.P.Code: 20EE0219	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
ELECTRICAL DISTRIBUTION AND AUTOMATION
(Electrical & Electronics Engineering)

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

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

		UNIT-I			
1	a	What is Load curve ? what is the importance of load curve?	CO1	L2	6M
	b	A power station has a maximum demand of 15000 kW. The annual load factor is 50% and plant capacity factor is 40%. Determine the reserve capacity of the plant.	CO1	L4	6M
		OR			
2		Draw a schematic single line diagram of an electrical distribution system and Explain its typical parts in detail.	CO1	L4	12M
		UNIT-II			
3	a	Explain connection schemes of distribution system and give the advantages disadvantages.	CO2	L2	6M
	b	What are Advantages and Disadvantages of AC distribution System.	CO2	L2	6M
		OR			
4		A single phase distributor 2 kilometers long supplies a load of 120 A at 0•8 p.f. lagging at its far end and a load of 80 A at 0•9 p.f. lagging at its mid-point. Both power factors are referred to the voltage at the far end. The resistance and reactance per km (go and return) are 0•05 Ω and 0•1 Ω respectively. If the voltage at the far end is maintained at 230 V, calculate:(i) Voltage at the sending end (ii) Phase angle between voltages at the two ends.	CO2	L4	12M
		UNIT-III			
5	a	Explain the various factors to be considered to decide the ideal location of substation.	CO3	L2	6M
	b	Explain the Grounded and ungrounded system.	CO3	L2	6M
		OR			
6		Explain the classification of Substations.	CO3	L2	12M
		UNIT-IV			
7		Explain the role of shunt and series capacitors in power factor correction.	CO4	L2	12M
		OR			
8		How we can improve the power factor and explain different types of Power Factor Improvement Equipment.	CO4	L2	12M
		UNIT-V			
9	a	What are the benefits of distribution automation.	CO5	L2	6M
	b	Explain about Information technology and LAN.	CO5	L2	6M
		OR			
10		Explain distribution automation? Give the various functions of distribution automation.	CO5	L3	12M

***** END *****

O.P.Code: 20EC0430	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Communications Engineering)

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

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

		UNIT-I			
1	a	Write a short note on (i) Gross Errors (ii) Systematic errors (iii) Random errors.	CO1	L2	6M
	b	Explain in detail about multirange DC voltmeter & AC voltmeter.	CO1	L2	6M
		OR			
2		With the help of circuit diagram, describe the construction & working of a Series type Ohmmeter	CO1	L2	12M
		UNIT-II			
3	a	What are the Standard Specifications of CRO?	CO2	L2	6M
	b	Sketch the Vertical deflection systems and explain it's working principle.	CO2	L3	6M
		OR			
4	a	Explain the procedure of signal's Amplitude, Frequency and Phase measurement using a Lissajous method using neat diagrams.	CO2	L2	6M
	b	Explain the operation of Digital frequency Meter/ counter and write it's applications.	CO2	L3	6M
		UNIT-III			
5	a	Using a neat block diagram explain the operation of a function generator.	CO3	L3	6M
	b	Explain the method to generate random noise.	CO3	L2	6M
		OR			
6	a	Draw the block diagram of logic analyzer and explain its working.	CO3	L2	6M
	b	Explain the working principle of spectrum analyzer.	CO3	L2	6M
		UNIT-IV			
7	a	Describe the operation of the Wheatstone bridge and derive the expression for current when the bridge is unbalanced.	CO4	L3	6M
	b	Explain the working principle of Schering bridge circuit.	CO4	L2	6M
		OR			
8	a	Write the advantages and disadvantages Anderson's bridge circuit.	CO4	L2	6M
	b	What are the errors and precautions to be taken while using the Bridge circuits?	CO4	L2	6M
		UNIT-V			
9		Describe the operation of i) Resistive transducers ii) Capacitive transducers.	CO5	L3	12M
		OR			
10	a	With a neat sketch, explain the operation of LVDT.	CO5	L2	6M
	b	What are the advantages & disadvantages of Resistance thermometer?	CO5	L2	6M

***** END *****

O.P.Code: 20ME0329	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
INDUSTRIAL ENGINEERING AND MANAGEMENT
(Mechanical Engineering)

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

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

		UNIT-I			
1	a	Summarize the important characteristics of management.	CO1	L2	6M
	b	Compare Douglas McGregor's Theory X and Theory Y.	CO1	L2	6M
		OR			
2		Illustrate the Maslow's Hierarchy of human needs.	CO1	L2	12M
		UNIT-II			
3		What are the factors governing the plant location? Explain with any one specific industry.	CO2	L1,2	12M
		OR			
4		Explain with neat sketch about the process layout and product layout along its merits and demerits.	CO2	L2	12M
		UNIT-III			
5		Explain the steps involved in method study procedure.	CO3	L2	12M
		OR			
6	a	Discuss about the SIMO chart with an example.	CO4	L6	8M
	b	What are the benefits of Work Measurement?	CO4	L1	4M
		UNIT-IV			
7	a	What do you mean by elasticity of demand? And also mention the factors governing the elasticity of demand.	CO5	L1	8M
	b	Explicate the concepts of Managerial Economics.	CO5	L2	4M
		OR			
8		Classify and explain the types of markets.	CO5	L2	12M
		UNIT-V			
9		Explain the importance of Supply Chain Management in the manufacturing Industry.	CO6	L2	12M
		OR			
10	a	List out the levels of Supply Chain Management and how they affect your business?	CO6	L2	6M
	b	Explain about the drivers that determine the performance of Supply Chain.	CO6	L2	6M

*** END ***

O.P.Code: 20ME0322	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
NON-CONVENTIONAL ENERGY RESOURCES
(Open Elective-I)

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

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

UNIT-I

1	a	Assess the need of renewable energy resources.	CO1	L5	6M
	b	Describe the impact of Energy Utilization on environment.	CO1	L2	6M
		OR			
2		Name the types of solar radiation measuring instruments? Explain the working of Sunshine recorder with a neat sketch.	CO1	L2	12M

UNIT-II

3	a	List out the major functions of solar thermal conversion systems	CO2	L1	6M
	b	Classify the solar collectors and explain them.	CO2	L4	6M
		OR			
4	a	List out the applications of solar PV cell.	CO2	L1	6M
	b	What factors affect the performance of solar flat plate collector?	CO2	L1	6M

UNIT-III

5		Illustrate the power generation process in HAWT with its merits and demerits.	CO3	L2	12M
		OR			
6		Classify the wind energy systems and explain their working with neat sketch.	CO3	L4	12M

UNIT-IV

7	a	Explain about biomass direct combustion.	CO4	L2	6M
	b	Name various strokers used for the combustion of biomass and explain anyone with a neat figure.	CO4	L1	6M
		OR			
8	a	What are the factors affecting the generation of biogas?	CO4	L1	6M
	b	Explicate various steps involved in the production of Ethanol.	CO4	L2	6M

UNIT-V

9		Explain the working of a fuel cell and their applications.	CO5	L2	12M
		OR			
10		Explain in detail about the hybrid systems.	CO5	L2	12M

***** END *****

O.P.Code: 20EE0227 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
GENERATION OF ENERGY FROM WASTE
(Open Elective-I)

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

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

UNIT-I

1		What is Industrial Waste? What are the effects of industrial waste? What is the management of industrial waste?	CO1	L3	12M
		OR			
2		What are the advantages and disadvantages of gasification? What are the advantages and disadvantages of incineration?	CO1	L2	12M

UNIT-II

3		What are the different types of pyrolysis process? Compare the different types of pyrolysis process.	CO2	L3	12M
		OR			
4		Explain the following types of charcoal production processes (i) Earth kiln (ii) Brick kiln (iii) Steel kiln	CO3	L2	12M

UNIT-III

5		Explain the design, construction and operation of fluidized bed gasifier.	CO4	L3	12M
		OR			
6		How gasifier output is utilized in Electrical Power Plants?	CO4	L2	12M

UNIT-IV

7		Briefly discuss various types of Combustors.	CO5	L3	12M
		OR			
8	a	What is Biomass Combustion?	CO5	L1	6M
	b	What is the Biomass Combustion Mechanism?	CO5	L1	6M

UNIT-V

9		What is meant by Biomass resources? Classify biomass resources based on their application.	CO6	L3	12M
		OR			
10	a	Explain Biomass gasification in detail.	CO6	L2	6M
	b	Explain Pyrolysis and Liquefaction in detail.	CO6	L2	6M

*** END ***

O.P.Code: 20EC0451 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025
INTRODUCTION TO COMMUNICATION SYSTEMS
(Open Elective-I)

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

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

		UNIT-I			
1	a	Define Communication and draw the basic block diagram of communication system.	CO1	L1	4M
	b	Explain the function of each block of communication system.	CO1	L2	8M
		OR			
2	a	Illustrate the Amplitude modulation for single tone information.	CO2	L2	6M
	b	Discuss the advantages and disadvantages of DSB-SC.	CO2	L6	6M
		UNIT-II			
3	a	What are the advantages, disadvantages, and applications of FM.	CO2	L1	6M
	b	Explain the generation of FM using direct method.	CO2	L2	6M
		OR			
4	a	Explain the block diagram of indirect method in FM generation.	CO2	L2	6M
	b	Differentiate between the Frequency Modulation and Phase Modulation with its modulated waveforms.	CO2	L2	6M
		UNIT-III			
5	a	Explain noise figure and derive its expression.	CO1	L2	6M
	b	A mixer stage has a noise figure of 20 dB and it is preceded by another amplifier with a noise figure of 9 dB and an available power gain of 15 dB. Calculate the overall noise figure referred to the input.	CO1	L3	6M
		OR			
6	a	Describe the demodulation technique of PWM signal.	CO4	L1	6M
	b	Differentiate between the Pulse Amplitude Modulation and Pulse Width Modulation with its modulated waveforms.	CO4	L2	6M
		UNIT-IV			
7	a	Illustrate with a neat block diagram explain PCM transmitter and receiver.	CO4	L3	6M
	b	Illustrate the different types of Quantization noise.	CO5	L2	6M
		OR			
8	a	Explain the Binary Phase Shift Keyingmodulator and demodulator	CO6	L2	6M
	b	Explain with suitable waveforms Binary Phase Shift Keying.	CO6	L2	6M
		UNIT-V			
9	a	Discuss briefly about the evolution of Mobile radio communication.	CO1	L2	6M
	b	Explain second generation (2G) cellular networks.	CO1	L2	6M
		OR			
10	a	Explain various hybrid spread spectrum techniques in CDMA.	CO6	L2	6M
	b	Describe space division multiple access (SDMA) scheme	CO6	L1	6M

***** END *****

O.P.Code: 20HS0813 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
MANAGEMENT SCIENCE
(Open Elective-I)

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

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

UNIT-I

1	a	Define Management and Explain the functions of Management.	CO1	L1	6M
	b	"Management is an art of getting things done through others" –Discuss.	CO1	L2	6M
		OR			
2	a	Illustrate any three types of organization structures.	CO1	L3	6M
	b	Assess which organizational structure is suitable structure for managing complex project(Matrix organization).	CO1	L5	6M

UNIT-II

3	a	What is meant by Inventory? What is the need for inventory control at different stages of production?	CO2	L4	6M
	b	Elucidate the Quality assurance and Quality control.	CO2	L4	6M
		OR			
4		Build different Strategies involved under stages of Product Life Cycle.	CO2	L3	12M

UNIT-III

5	a	Define Human Resource Management and Explain Managerial and operative function of HRM.	CO3	L1	6M
	b	Differentiate between On-the-Job and Off-the-Job training methods.	CO3	L2	6M
		OR			
6	a	What do you understand by employee grievances in an organization?	CO3	L1	6M
	b	What are the steps involved in setting up grievance redressal mechanism?	CO3	L1	6M

UNIT-IV

7	a	Indicate the Rules for drawing network analysis in Project Planining.	CO4	L2	6M
	b	Describe difference between CPM and PERT, in the context of project management.	CO4	L2	6M
		OR			
8	a	What is environmental scanning? Explain Internal environment by taking an example?	CO4	L1	6M
	b	Express the process of strategy formulation and implementation.	CO4	L2	6M

UNIT-V

9	a	Detail note on Management Information System (MIS).	CO5	L2	6M
	b	What is ERP? Explain the significance of ERP packages.	CO5	L1	6M
		OR			
10		What is balanced score card? How it is useful for a company?	CO5	L1	12M

***** END *****

O.P.Code: 20CS0516	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025
COMPILER DESIGN
(Common to CSIT & CSE)

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

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

UNIT-I

1	a	Describe about different language processors used in compiler design	CO1	L2	6M
	b	Give the differences between compiler and interpreter.	CO1	L4	6M

OR

2		Explain the phases of a compiler with neat diagram.	CO2	L2	12M

UNIT-II

3	a	Define Ambiguity.	CO2	L1	2M
	b	Interpret how to eliminate ambiguity for the given Ambiguous Grammar.	CO2	L3	10M

OR

4	a	Describe the procedure of eliminating Left recursion.	CO2	L5	6M
	b	Eliminate left recursion for the following grammar E->E+T/T T->T*F/F F-> (E)/id	CO2	L1	6M

UNIT-III

5	a	Define YACC parser in Syntax Analysis.	CO3	L1	6M
	b	Explain in detail about YACC Parser generator tool.	CO3	L2	6M

OR

6	a	Explain syntax directed definition with example	CO3	L2	6M
	b	Define a syntax-directed translation and explain with example.	CO3	L2	6M

UNIT-IV

7		Analyse different types of Intermediate Code with an example.	CO4	L4	12M

OR

8		Explain Representation of Three Address Codes with suitable Examples	CO4	L2	12M

UNIT-V

9		Interpret optimization techniques on basic blocks with simple example.	CO5	L3	12M

OR

10	a	Discuss about function preserving transformations.	CO5	L2	6M
	b	Describe about loop optimization technique.	CO6	L2	6M

*** END ***

O.P.Code: 20CS1101	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
INTRODUCTION TO DATA SCIENCE
CSE(Artificial Intelligence & DataScience)

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

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

		UNIT-I			
1	a	What is meant by exploratory data analysis.	CO1	L2	6M
	b	Define Data Science and discuss Benefits and uses of data science.	CO1	L3	6M
		OR			
2		How will you retrieve the required data from data science.	CO1	L3	12M
		UNIT-II			
3	a	Examine the application property of Wilcoxon rank-sum test.	CO2	L3	6M
	b	Explain Apriori Algorithm with example.	CO2	L2	6M
		OR			
4	a	What is a type I error? What is a type II error? Is one always more serious than the other?	CO2	L3	6M
	b	Discriminate about Difference of Means.	CO2	L2	6M
		UNIT-III			
5	a	Which two basic measures does the entropy methods select the most informative attribute?	CO3	L3	6M
	b	Describe Decision Trees in detail with example.	CO3	L2	6M
		OR			
6		Explain the analytical technique Linear Regression with its model description.	CO3	L3	12M
		UNIT-IV			
7	a	What is forecasting in association with time series. Explain?	CO4	L2	6M
	b	Discriminate the steps involved in Box-Jenkins Methodology.	CO4	L3	6M
		OR			
8		Illustrate the method to find k clusters from a collection of M objects with n attributes.	CO4	L3	12M
		UNIT-V			
9	a	Describe the usage of TFIDF to compute the usefulness of each word in the texts.	CO5	L3	6M
	b	Interpret the procedure used in data science to gain insights into customer opinions.	CO5	L3	6M
		OR			
10		Explain how the data science team will categorize the reviews by topics.	CO5	L3	12M

***** END *****

Q.P.Code: 20CS0903 | R20 | H.T.No. | | | | | | | | | |

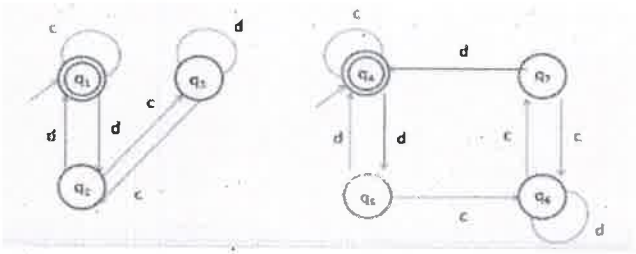
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
AUTOMATA THEORY AND COMPILER DESIGN
(Common to CSM, CIC & CAI)

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

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

UNIT-I

1	a	Write the process of equivalence two FA's.	CO1	L3	6M
	b	Compare the equivalence two FA's or not.	CO1	L4	6M



OR

2	a	Contrast Mealy machine and Moore machine.	CO1	L3	6M
	b	Convert the following Mealy machine into its equivalent Moore machine.	CO1	L2	6M

Present State	I/P=0		I/P=1	
	Next State	O/P	Next State	O/P
→A	C	0	B	0
B	A	1	D	0
C	B	1	A	1
D	D	1	C	0

UNIT-II

3	a	Describe what is meant by Simplifying the Grammar.	CO2	L4	6M
	b	Differentiate PCP and MPCP.	CO2	L3	6M

OR

4	a	Show that L = {anbncn , where n>=1} is not context free.	CO2	L4	6M
	b	State Pumping lemma for Context-free language.	CO2	L2	6M

UNIT-III

5	a	Explain LEX Tool with the structure of Lex Program.	CO3	L4	6M
	b	Perform left factor for the grammar A→abB/aB/cdg/cdeB/cdfB.	CO3	L2	6M

OR

6	a	Illustrate the rules to be followed in finding the FIRST and FOLLOW.	CO3	L3	6M
	b	Consider the grammar E→E+T/T, T→T*F/F, F→(E)|id Design predictive parsing table and check given grammar is LL(1) Grammar or not?	CO3	L4	6M

UNIT-IV

7		Explain in detail about YACC Parser generator tool.	CO4	L3	12M

OR

8	a	Describe in detail the Translation scheme of SDD.	CO4	L3	6M
	b	Discuss Type Checking with suitable examples.	CO4	L3	6M

UNIT-V

9	a	Define and Show Dead-code elimination with example.	CO5	L2	6M
	b	Interpret optimization techniques on Basic Blocks with simple examples.	CO5	L3	6M

OR

10	a	Explain the peephole optimization Technique with examples.	CO5	L2	6M
	b	List and explain the Issues in the design of a code generator.	CO5	L3	6M

***** END *****

Q.P.Code: 20CE0119	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
STRUCTURAL DESIGN
(Civil Engineering)

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

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

UNIT-I

1		A singly reinforced concrete beam 250mm x 550mm is reinforced with 3# of 20mmϕ with an effective cover of 50mm. The beam is cantilever over a span of 3m. Find the safe uniformly distributed load the beam can carry. Use M20 grade concrete and Fe415 grade steel. Use limit state method.	CO1	L3	12M
		OR			
2		A reinforced concrete beam of size 230mm x 450mm overall, carries a 'udl' of 20 kN/m excluding self-weight, the effective span of beam is 5.5m. Design the reinforcement for the beam. Use M20 grade concrete and Fe500 steel assuming an effective cover of 40mm.	CO1	L4	12M

UNIT-II

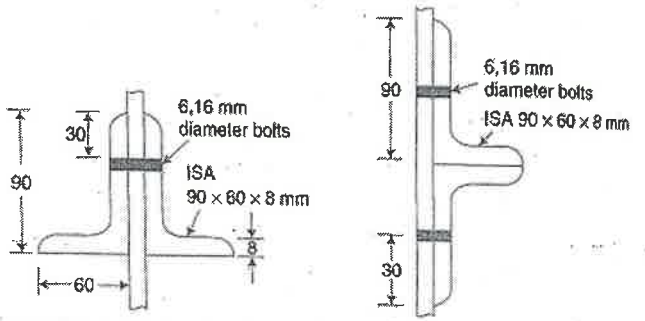
3		A reinforced concrete beam of rectangular section 300mm wide is reinforced with 4# of 25mmϕ at an effective depth of 600mm. The beam has to resists a factored shear force of 400kN at support section. Assume fck = 25 N/mm2 and fy = 415 N/mm2, design the vertical stirrups for the section.	CO2	L4	12M
		OR			
4		Design a two-way slab for a room 4m x 3.5m clear in size, if live load is 3kN/m2 and floor finish of 1kN/m2. The edges of the slab are simply supported and corners are not held down. Use M20 grade concrete and Fe415 grade steel.	CO2	L4	12M

UNIT-III

5		Design a circular column to carry an axial load of 1000 kN. Use M20 grade concrete and Fe415 steel.	CO3	L4	12M
		OR			
6		Design a square footing of uniform thickness for a reinforced concrete circular column of diameter 400mm carrying an axial load of 1000 kN. The safe bearing capacity of soil is 200 kN/m2. Use M20 grade concrete and Fe415 steel.	CO4	L4	12M

UNIT-IV

7	a	Define bolting & explain various terminologies used in bolting.	CO5	L2	6M
	b	Explain various types of bolted connections with neat sketch.	CO5	L2	6M
		OR			
8		Determine the tensile capacity of the section shown below if i)Angles are placed on the opposite sides of gusset plate (tack bolted) ii)Angles are placed on the same side of gusset plate (tack bolted) iii)Angles are not tack	CO5	L3	12M



(a) Angles on opposite side of gusset plate (b) Angles on same side of gusset pla

UNIT-V

9		A column 4m long has to support a factored load of 6000 kN. The column is effectively held at both ends and restrained in direction at one of the ends. Design the column using beam section and plates.	CO6	L4	12M
		OR			
10		Design a simply supported beam of effective span 1.5m carrying a factored concentrated load of 360 kN at mid span.	CO6	L4	12M

***** END *****

Q.P.Code: 20EE0214	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
CONTROL SYSTEMS
(Electrical & Electronics Engineering)

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

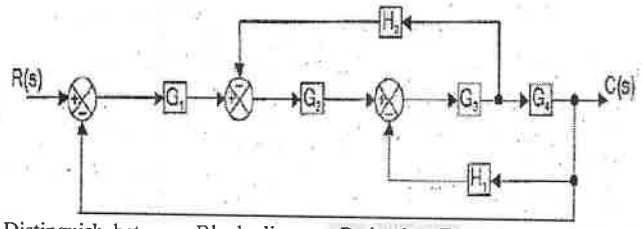
(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

1	a	Define Open loop and Closed loop control systems with examples.	CO1	L2	6M
	b	Give the block diagram reduction rules to find the transfer function of the system.	CO1	L3	6M

OR

2	a	For the system represented in the given figure, obtain transfer function C(S)/R(S).	CO1	L3	6M



	b	Distinguish between Block diagram Reduction Technique and Signal Flow Graph?	CO1	L2	6M

UNIT-II

3	a	What is the Transient and steady state response of first and second order systems.	CO2	L2	6M
	b	Define steady state error, Derive the static error components for Type 0, Type 1 & Type 2 systems.	CO2	L3	6M

OR

4	a	For servo mechanisms with open loop transfer function given below what type of input signal give rise to a constant steady state error and calculate their values. $G(S)H(S) = \frac{10}{S^2(S+1)(S+2)}$.	CO2	L3	6M
	b	What is the characteristic equation? List the significance of characteristic equation.	CO2	L2	6M

UNIT-III

5		Develop the root locus of the system whose open loop transfer function is $G(S) = \frac{K}{S(S+2)(S+4)}$.	CO3	L3	12M

OR

6	a	With the help of Routh's stability criterion find the stability of the following systems represented by the characteristic equations: i) $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$. ii) $s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0$.	CO3	L3	8M
	b	What is the stability the of the system. Explain the procedure for Routh Hurwitz stability criterion.	CO3	L2	4M

UNIT-IV

7		Develop the Bode plot for the following transfer function and determine the system phase and gain cross over frequencies $G(S) = \frac{10}{S(1+0.4S)(1+0.1S)}$	CO4	L3	12M

OR

8	a	Determine the transfer function of Lead Compensator and draw pole-zero plot.	CO4	L2	6M
	b	Given ξ = 0.7 and ω_n = 10 rad/sec. Find resonant peak, resonant frequency and bandwidth	CO4	L3	6M

UNIT-V

9		Determine the Solution for Homogeneous and Non homogeneous State equations.	CO5	L3	12M

OR

10	a	Find state variable representation of an armature controlled D.C motor.	CO5	L2	6M
	b	Derive the expression for the transfer function from the state model. $\dot{X} = Ax + Bu \; and \; y = Cx + Du$	CO5	L3	6M

*** END ***

O.P.Code: 20EC0415	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

(Electronics & Communications Engineering)

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

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

		UNIT-I			
1	a	Define Electric field intensity and write the properties electric flux	CO1	L1	6M
	b	Explain the following types of charge distributions. i) Line charge distribution. ii) Surface charge distribution	CO2	L2	6M
		OR			
2	a	Determine the Electric flux density at a point P due to infinite sheet of Charge using Gauss law.	CO2	L3	6M
	b	A charge of 5x10-8C is distributed uniformly on the surface of a sphere of radius 1cm. It is a sphere of radius 6 cm. Determine electric flux density.	CO2	L3	6M
		UNIT-II			
3	a	Explain Ampere's Circuit Law.	CO1	L2	6M
	b	Determine the Magnetic Field Intensity due to a infinite sheet current.	CO2	L3	6M
		OR			
4		List differential and integral form of Maxwell's equation for static EM filed.	CO2	L1	12M
		UNIT-III			
5	a	Derive the expression for Stationary Loop in Time Varying B field ?	CO2	L3	6M
	b	Define Displacement Current with expression.	CO2	L2	6M
		OR			
6	a	Discuss Maxwell's equation in both differential and integral in final form.	CO2	L3	6M
	b	In free space, H= 10 sin(ωt-100x)ay A/m. Calculate E.	CO4	L3	6M
		UNIT-IV			
7	a	Evaluate the wave characteristics of plane wave in lossless dielectric medium.	CO5	L4	6M
	b	Derive the expression for intrinsic impendence and propagation constant in a good conductor.	CO5	L3	6M
		OR			
8		Evaluate the expressions for reflection coefficient and transmission coefficient by a normal incident wave for a dielectric medium.	CO5	L4	12M
		UNIT-V			
9		Deduce the equation for voltage and current at any point in a transmission line.	CO6	L4	12M
		OR			
10	a	Explain about S-Circle, r-Circle and x-Circle in smith chart.	CO6	L4	6M
	b	Discuss about Microstrip transmission lines.	CO6	L2	6M

*** END ***

O.P.Code: 20ME0314	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
DESIGN OF MACHINE ELEMENTS-I
(Mechanical Engineering)

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

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

UNIT-I

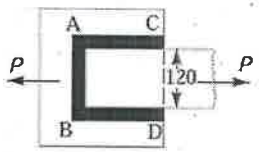
1		A hollow shaft of 40 mm outer diameter and 25 mm inner diameter is subjected to a twisting moment of 120 N-m, simultaneously, it is subjected to an axial thrust of 10 kN and a bending moment of 80 N-m. Calculate the maximum compressive and shear stresses.	CO1	L4	12M
		OR			
2	a	Define preferred numbers and explain its applications.	CO1	L1	6M
	b	Derive an expression for the impact stress induced due to a falling load.	CO1	L3	6M

UNIT-II

3		Cylindrical shaft made of steel of yield strength 700 MPa is subjected to static loads consisting of bending moment 10 kN-m and a torsional moment 30 kN-m. Determine the diameter of the shaft using two different theories of failure, and assuming a factor of safety of 2. Take E = 210 GPa and poisson's ratio = 0.25.	CO2	L3	12M
		OR			
4		A machine component is subjected to a flexural stress which fluctuates between + 300 MN/m^2 and – 150 MN/m^2. Determine the value of minimum ultimate strength according to 1. Gerber relation; 2. Modified Goodman relation; and 3. Soderberg relation. Take yield strength = 0.55 Ultimate strength; Endurance strength = 0.5 Ultimate strength; and factor of safety = 2.	CO2	L3	12M

UNIT-III

5		Determine the length of the weld run for a plate of size 120 mm wide and 15 mm thick to be welded to another plate by means of A single transverse weld; and Double parallel fillet welds when the joint is subjected to variable loads.	CO3	L4	12M



OR

6	a	List out the important terms used in screw threads with a neat sketch.	CO3	L1	6M
	b	What are the advantages of preloading bolted joints?	CO3	L1	6M

UNIT-IV

7		Design a gib and cottor joint to carry a maximum load of 35 kN. Assuming that the gib, cotter and rod are of same material and have the following allowable stresses : σ_t = 20 MPa ; τ = 15 MPa ; and σ_c = 50 MPa.	CO5	L3	12M
		OR			
8	a	Classify the type of stresses induced in shafts.	CO4	L2	6M
	b	A solid shaft is transmitting 1 MW at 240 r.p.m. Determine the diameter of the shaft if the maximum torque transmitted exceeds the mean torque by 20%. Take the maximum allowable shear stress as 60 MPa.	CO4	L3	6M

UNIT-V

9		Design and draw a cast iron flange coupling for a mild steel shaft transmitting 90 kW at 250 r.p.m. The allowable shear stress in the shaft is 40 MPa and the angle of twist is not to exceed 1° in a length of 20 diameters. The allowable shear stress in the coupling bolts is 30 MPa.	CO6	L3	12M
		OR			
10	a	What are the forces acting on sunk key? Explain with neat sketch.	CO6	L2	6M
	b	A 15 kW, 960 r.p.m. motor has a mild steel shaft of 40 mm diameter and the extension being 75 mm. The permissible shear and crushing stresses for the mild steel key are 56 MPa and 112 MPa. Design the keyway in the motor shaft extension. Check the shear strength of the key against the normal strength of the shaft.	CO5	L2	6M

***** END *****

O.P.Code: 20CE0136	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
FOUNDATION ENGINEERING
(Civil Engineering)

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

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

UNIT-I

1		A cantilever retaining wall of 7mts height retains sand. The properties of sand are e=0.5,φ=300 and G=2.7.Using Rankines theory Determine the active earth pressure at the base when the backfill is (i) dry (ii) saturated (iii)submerged and also the resultant active force in each case.	CO1	L3	12M
		OR			
2	a	Explain various types of retaining walls with neat sketch.	CO1	L2	6M
	b	With the help of neat sketch explain design of gravity retaining walls.	CO1	L2	6M

UNIT-II

3	a	List out various parameters for choice of type of foundation.	CO2	L2	6M
	b	What are different types of settlements that occur in a foundation?	CO2	L2	6M
		OR			
4		A strip footing of 2m width is founded at a depth of 4m below the ground surface. Determine the net ultimate bearing capacity, using a) Terzaghi's equation (Nc=5.7, Nγ=1.0, Nq=0.0) b) Skempton's equation c) IS Code (Nc=5.14). The soil is clay (φ=00 , C-10kN/m2).The unit weight of soil is 20kN/m^3 .	CO2	L3	12M

UNIT-III

5	a	How would you estimate the group action of piles in (i) sand (ii) clay?	CO3	L2	6M
	b	A square concrete pile (30cm side) 10 m long is driven into coarse sand (γ=18.5 kN/m3 , N=2.0). Determine the allowable load (F.S. =3.0).	CO3	L3	6M
		OR			
6	a	A 30cm diameter concrete pile is driven into a homogeneous consolidated clay deposit (cu=40kN/m2 , α=0.7).If the embedded length is 10m, estimate the safe load (F.S. =2.5).	CO3	L3	6M
	b	Explain in detail In-situ penetration tests for pile capacity.	CO3	L3	6M

UNIT-IV

7	a	Describe the various components of pneumatic caisson with the help of neat sketch.	CO4	L2	6M

	b	Discuss various forces acting on well foundation.	CO4	L2	6M
		OR			
8	a	Explain different shapes of wells with neat sketch.	CO4	L1	6M
	b	Explain the construction of Floating caisson with the help of neat sketch.	CO4	L1	6M
		UNIT-V			
9	a	Explain the pressure distribution and stability of free cantilever sheet pile with neat sketch.	CO5	L2	6M
	b	Explain the stability of anchored sheet piles with free earth support with neat sketch.	CO5	L2	6M
		OR			
10		Determine the required of penetration of the cantilever sheet pile as shown in fig.2 Take γ=16kN/m^3.	CO5	L3	12M

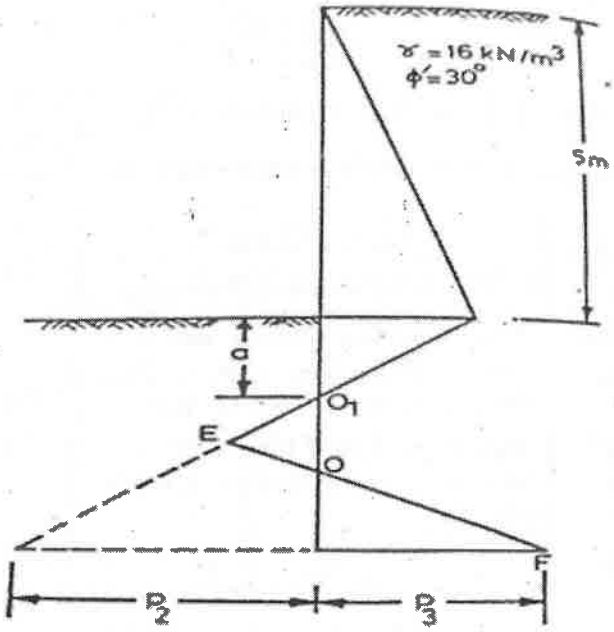


Fig:-2

***** END *****

O.P.Code: 20EC0417	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

DIGITAL SIGNAL PROCESSING

(Electronics & Communicatioms Engineering)

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

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

UNIT-I

1	a	Explain the relationship between DFT with other transforms.	CO1	L2	6M
	b	Compute the 4-point DFT for the sequence $x(n) = 1 ; 0 \le n \le 2$ $= 0 ;$ otherwise	CO1	L1	6M
		OR			
2		Compute 8-point DFT of the sequence x(n) = {0,1,2,3,4,5,6,7} using Radix-2 DIF-FFT Algorithm.	CO3	L1	12M

UNIT-II

3	a	Explain the steps in the design of an analog Chebyshev low pass filter.	CO2	L2	6M
	b	Design an analog filter using Chebyshev approximation for the specifications αp = 3dB and αs = l6dB; fp = lKHz and fs = 2KHz.	CO2	L3	6M
		OR			
4	a	Construct the cascade form structure of the system with difference equation $y(n) = \frac{3}{4}y(n-1) - \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$	CO2	L3	6M
	b	Construct the parallel form structure of the system with difference equation $y(n) = -0.1y(n-1) + 0.72y(n-2) + 0.7x(n) - 0.252x(n-1)$	CO1	L3	6M

UNIT-III

5	a	i) What is a window? Why it is necessary?	CO2	L4	2M
		ii) Explain the Procedure for designing FIR filters using windows	CO2	L2	4M
	b	Give the equations for Rectangular, Hanning and Hamniing window and explain its significance.	CO2	L2	6M
		OR			
6	a	Write the design steps of FIR filter using Frequency sampling technique.	CO2	L2	6M
	b	Design an ideal High pass filter with the frequency response $H_d(e^{jw}) = 1$ for $\frac{\pi}{4} \le \lvert\omega\rvert \le \pi$ $= 0 \quad \lvert\omega\rvert \le \frac{\pi}{4}$ Find the values of hon) for N-11 and find H(z).	CO1	L3	6M

UNIT-IV

7	a	Explain quantization noise and its methods with suitable example.	CO4	L2	6M
	b	Discuss in detail the errors resulting from rounding and truncation.	CO5	L2	6M
		OR			
8	a	What is meant by zero limit cycle oscillation? Explain with example.	CO4	L2	6M
	b	Explain the characteristics of limit cycle oscillation with respect to the system described by the difference equation y(n) = αy(n-1) + x(n). Assume $\alpha = \frac{1}{2}$ data register length is 3 bits, the system is excited by an input x(n)={ 0.875 for n=0 Also determine dead band of the filter. 0 for otherwise	CO1	L3	6M

UNIT-V

9	a	Explain the Multiplier and Multiplier Accumulator (MAC), Modified bus structures in brief with relevant diagram.	CO6	L2	6M
	b	What is VLIW architecture? Draw and explain in brief with diagram.	CO6	L2	6M
		OR			
10	a	What are the different parts in central processing units of TMS320C50 and explain its need in brief?	CO6	L2	6M
	b	Explain the bus structure of TMS320C50 and explain its need.	CO6	L2	6M

***** END *****

O.P.Code: 20ME0315	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Supplementary Examinations October/November-2025

HEAT AND MASS TRANSFER

(Mechanical Engineering)

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

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

UNIT-I

1	a	Define the following terms. i).Heat ii).Heat transfer	CO1	L1	6M
	b	Enumerate the some important areas which are covered under the discipline of heat transfer.	CO1	L1	6M
		OR			
2	a	Write the laws of radiation? Explain its parameters	CO1	L1	6M
	b	A surface having an area of 1.5 m^2 and maintained at 300 ℃ exchanges heat by radiation with another surface at 40 ℃. The value factor due to the geometric location and emissivity is 0.52. Determine i).Heat loss by radiation ii).The value of thermalresistance iii).The value of equivalent convection coefficient.	CO1	L3	6M

UNIT-II

3	a	Derive an expression for heat conduction through a composite wall.	CO2	L3	6M
	b	A reactor's wall, 320 mm thick, is made up of an inner layer of fire brick (k = 0.84W/m ℃) covered with a layer of insulation (k = 0.16 W/m ℃). The reactor operates at a temperature of 1325 ℃ and the ambient temperature is 25 ℃. Determine the thickness of fire brick and insulation which gives minimum heat loss.	CO2	L3	6M
		OR			
4	a	Derive an expression for heat conduction through a plane wall.	CO2	L3	6M
	b	Calculate the critical radius of insulation for asbestos (k = 0.172 W/m K) surrounding a pipe and exposed to room air at 300 K with h = 2.8 W/m K. Calculate the heat loss from a 475 K, 60 mm diameter pipe when covered with the critical radius of insulation and without insulation.	CO2	L4	6M

UNIT-III

5	a	What is convective heat transfer? Distinguish between free and forced convection.	CO3	L4	6M
	b	Derive the expression for Reynolds number and how flows are determined by Reynolds number?	CO3	L3	6M
		OR			
6	a	Derive the empirical correlation of free convection.	CO3	L3	6M
	b	A vertical cylinder 1.5m high and 180 mm in diameter is maintained at 100 ℃ in an atmosphere environment of 20 ℃. Calculate heat loss by free convection from the surface of the cylinder. Assume properties of air at mean temperature as ρ = 1.06 kg/m^3 ,ν = 18.97 x 10-6 m^2/s, cp = 1.004 kJ/kg ℃ and k = 0.1042kJ/mh ℃.	CO3	L4	6M

UNIT-IV

7	a	Define Radiation heat transfer.	CO4	L1	6M
	b	Define the term absorptivity, reflectivity and transmittivity of radiation.	CO4	L1	6M
		OR			
8	a	Differentiate between the mechanism of film wise and drop wise condensation.	CO4	L4	6M
	b	Assuming the sun to be a black body emitting radiation with maximum intensity at λ = 0.49 μm, calculate the following i)The surface temperature of the sun ii)The heat flux at surface of the sun.	CO4	L4	6M

UNIT-V

9		A vertical tube of 60 mm outside diameter and 1.2 m long is exposed to steam at atmospheric pressure. The outer surface of the tube is maintained at a temperature of 50 ℃ by circulated cold water through the tube. Calculate the following i). The rate of heat transfer to the coolant, and ii). The rate of condensation of steam.	CO5	L4	12M
		OR			
10	a	Discuss about the modes of Mass transfer.	CO5	L2	6M
	b	What is Mass transfer coefficient? Explain it briefly.	CO5	L2	6M

***** END *****

O.P.Code: 20EE0215 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
ELECTRICAL MACHINES-III
(Electrical and Electronics Engineering)

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

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

UNIT-I

1		Explain the different types of armature windings used in alternators and discuss their constructional features, working, and importance.	CO1	L2	12M
		OR			
2	a	Explain the concept of pitch factor and derive its expression with a neat phasor representation.	CO1	L3	6M
	b	A 3-phase winding has 4 slots per pole per phase and a coil span of 10 slot pitches. Determine the pitch factor and distribution factor of the winding.	CO1	L3	6M

UNIT-II

3	a	Define voltage regulation of an alternator. Explain the various factors affecting voltage regulation under different load conditions.	CO2	L2	6M
	b	Explain the concepts of direct-axis reactance and quadrature-axis reactance of a salient pole alternator using the two-reaction theory.	CO2	L2	6M
		OR			
4		During open-circuit and short-circuit tests on a 3-phase, star-connected, 866 V, 100 KVA alternator, the following data were obtained: i). A field current of 1 A produces a short-circuit current of 25 A. ii). The armature resistance per phase is 0.15 Ω. Calculate the full-load voltage regulation at 0.8 power factor lagging.	CO2	L3	12M

UNIT-III

5	a	Define synchronization of alternators and explain any one method used for synchronizing an alternator with another alternator or with a common bus bar.	CO3	L2	6M
	b	Explain the procedure for synchronizing an alternator with an infinite bus bar.	CO3	L2	6M
		OR			
6		A 5000 KVA, 10 KV, 1500 rpm, 50 Hz alternator operates in parallel with other alternators. Its synchronous reactance is 20%. Determine: i). the synchronizing power per unit mechanical angle under no-load, and full-load at 0.8 power factor lagging. ii). the corresponding synchronizing torque, if the mechanical displacement is 0.5°.	CO3	L3	12M

UNIT-IV

7	a	Explain the power flow diagram of a synchronous motor, showing the various power stages and losses.	CO4	L2	6M
	b	Describe the behavior of a synchronous motor under varying load conditions with the help of suitable characteristics.	CO4	L2	6M

OR

8	a	Define a synchronous condenser. Explain the use for power factor improvement with a neat phasor diagram.	CO4	L2	6M
	b	A 3-phase, 500 V, star-connected synchronous motor delivers a net output of 17 KW at full load with a power factor of 0.9 lagging. The armature resistance is 0.8 Ω per phase and the mechanical losses are 1300 W. Determine the armature current and full-load efficiency of the motor.	CO4	L3	6M

UNIT-V

9	a	Explain the phenomenon of hunting in a synchronous motor, state its causes, and describe the methods of minimizing it.	CO5	L2	6M
	b	Discuss the different types of torques developed in a synchronous motor and their significance.	CO5	L2	6M

OR

10	a	Explain the construction and operating principle of a synchronous induction motor.	CO5	L2	6M
	b	An industrial load of 800 KW operates at a power factor of 0.6 lagging. It is desired to improve the overall power factor to 0.92 lagging by connecting a synchronous motor driving a 200 KW mechanical load at 91% efficiency. Determine: i). the kVA rating of the synchronous motor, and ii). the operating power factor of the motor.	CO5	L3	6M

***** END *****