O.P.Code: 20EC448	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations June-2025
DIGITAL ELECTRONICS
(Electrical & Electronics Engineering)

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

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

UNIT-I

1	a	Convert the following numbers to Decimal and then to Octal. (i) $(423416)_{10}$ (ii)$(10010011)_2$.	CO1	L1	6M
	b	Subtraction by using 2's complement for the given 111001-1010.	CO1	L3	6M
		OR			
2		A receiver with even parity hamming code is received the data as 1110110. Determine the correct code.	CO1	L3	12M

UNIT-II

3		Minimize the given Boolean function F(A,B,C,D)=Σm (2,3,5, 7,8,10, 12, 13) using tabulation method.	CO2	L2	12M
		OR			
4	a	Simplify the following expression using the K-map for the 3-variable. Y = AB'C+A'BC+A'B'C+A'B'C'+AB'C'.	CO2	L3	6M
	b	Simplify the following Boolean expressions using K-map. F(A, B, C, D)= Σm(1,3,7,11,15)+ Σd(0,2,5)	CO2	L3	6M

UNIT-III

5		Design & implement Half Adder and Full Adder with truth table.	CO3	L3	12M
		OR			
6		What is Demultiplexer? Desingn1:8 Demultiplexer using 1:4 Demultiplexers.	CO4	L1	12M

UNIT-IV

7		What is SR latch? Explain the operation for different cases By using Truth table.	CO5	L1	12M
		OR			
8		Implement 4-bit ring counter using suitable shift register. Briefly describe its operation.	CO5	L3	12M

UNIT-V

9		Implement PLA circuit for the following functions F1(A,B,C)= Σm(3,5,6,7),F2(A,B,C)= Σm(0,2,4,7).	CO6	L3	12M
		OR			
10		What is RAM organization? Explain about Different types of RAM.	CO6	L3	12M

***** END *****

O.P.Code: 20ME0307	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
CAD/CAM
(Mechanical Engineering)

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

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

UNIT-I

1	a	Draw the product cycle and CAD/CAM product cycle with neat Sketch.	CO1	L2	6M
	b	Explain the product cycle and CAD/CAM product cycle.	CO1	L2	6M
		OR			
2	a	Explain about homogeneous transformations.	CO1	L2	6M
	b	Write short notes on Rotation about a Fixed Point, Reflections and Shears.	CO1	L2	6M

UNIT-II

3		Explain the Constructive Solid Geometry (CSG) method to create models.	CO2	L2	12M
		OR			
4	a	Define the solid modeling and Explain any one type of solid Modeling.	CO2	L2	6M
	b	Compare 2-D and 3-D wire frame models.	CO2	L2	6M

UNIT-III

5	a	Differentiate Manual part programming and Computer assisted part programming.	CO3	L4	6M
	b	What are the advantages and disadvantages of Numerical control system?	CO3	L1	6M
		OR			
6	a	Explain in detail about cutter radius compensation.	CO4	L2	6M
	b	Write a short notes on Manual part programming.	CO4	L2	6M

UNIT-IV

7	a	Explain about production flow analysis (PFA).	CO5	L2	6M
	b	Write brief notes on Group Technology.	CO5	L1	6M
		OR			
8	a	Explain in detail about Machine cell design.	CO5	L3	6M
	b	Elucidate briefly optical non-contact inspection methods.	CO5	L2	6M

UNIT-V

9		Illuminate MRP-II with neat sketch and also write its benefits.	CO6	L2	12M
		OR			
10	a	Differentiate MRP-I and MRP-II.	CO6	L2	6M
	b	Explain the features of MRP-I with a neat block diagram. State its applications.	CO6	L2	6M

***** END *****

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
MICROPROCESSORS AND MICROCONTROLLERS
(Common to CSE & CSIT)

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

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

		UNIT-I			
1		Draw a block diagram of Microprocessor based system and explain the functions of each component: Microprocessor, Memory and I/O and their line communication.	**CO1**	**L4**	**12M**
		OR			
2	**a**	Illustrate the microcomputer system with example.	**CO1**	**L3**	**6M**
	b	Draw the block diagram of output section of Microcomputer. Describe the role of tristate bus driver, decoder and latch.	**CO2**	**L4**	**6M**
		UNIT-II			
3	**a**	Define an interrupt and explain the different types of interrupts available in the 8085 microprocessor.	**CO2**	**L2**	**6M**
	b	List out the control and status signals in 8085 microprocessor.	**CO2**	**L1**	**6M**
		OR			
4	**a**	Explain the functions of a program counter, stack pointer & ALU in 8085 μP.	**CO2**	**L2**	**6M**
	b	Draw the flag register of the 8085 microprocessor and explain each bit in detail.	**CO2**	**L2**	**6M**
		UNIT-III			
5		Draw the pin diagram of 8051 microcontroller and describe the functionality of each pin in detail.	**CO3**	**L2**	**12M**
		OR			
6	**a**	Explain how the 8051 microcontroller transfers the serial data input and output using UART.	**CO2**	**L5**	**6M**
	b	Compare serial communication and parallel communication.	**CO4**	**L3**	**6M**
		UNIT-IV			
7	**a**	Explain the moving data instructions of 8051microcontroller with an example.	**CO4**	**L2**	**6M**
	b	Draw and explain the external addressing using mov x and mov c.	**CO4**	**L3**	**6M**
		OR			
8	**a**	List various incrementing and decrementing instructions with examples in 8051 microcontroller.	**CO4**	**L1**	**6M**
	b	Develop and write an assembly program of 8051microcontroller to unsigned additional and subtraction two 8-bit numbers and store the result in a 2055&2057 memory location.	**CO6**	**L6**	**6M**
		UNIT-V			
9	**a**	Discuss about Keyboards and human factors	**CO5**	**L6**	**6M**
	b	Describe and draw the keyboard configurations.	**CO5**	**L2**	**6M**
		OR			
10	**a**	Illustrate the multiple source interrupt circuit used in Lopri and Hipri program.	**CO6**	**L2**	**6M**
	b	Design and explain the real-time application using 8051 Microcontroller with suitable block diagram.	**CO6**	**L6**	**6M**

*** END ***

Q.P.Code: 20CS0505	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June-2025

DATABASE MANAGEMENT SYSTEMS

(Common to CIC & CCC)

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

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

		UNIT-I			
1	**a**	Define Database. Discuss about applications of Database Systems.	**CO1**	**L3**	**6M**
	b	List out the purpose of Database Systems.	**CO1**	**L2**	**6M**
		OR			
2	**a**	Illustrate about Views of data.	**CO1**	**L4**	**6M**
	b	Outline the Data Abstraction and discuss levels of Abstraction.	**CO1**	**L2**	**6M**
		UNIT-II			
3	**a**	Illustrate different operations in Relational algebra with an example.	**CO2**	**L3**	**6M**
	b	Discuss about the operators renaming, division	**CO2**	**L2**	**6M**
		OR			
4	**a**	What is a Join? Discuss about various joins used in SQL.	**CO2**	**L4**	**6M**
	b	Discuss about Complex integrity constraints in SQL	**CO2**	**L2**	**6M**
		UNIT-III			
5	**a**	Illustrate redundancy and the problems that it can cause.	**CO3**	**L3**	**6M**
	b	Explain about Functional Dependency.	**CO3**	**L4**	**6M**
		OR			
6	**a**	Compare Trivial and Non – Trivial Functional Dependencies with example.	**CO3**	**L3**	**6M**
	b	What is Normalization? List out the of purpose normalization.	**CO3**	**L3**	**6M**
		UNIT-IV			
7	**a**	Define a Transaction.List the properties of transaction	**CO4**	**L4**	**6M**
	b	How do you implement Atomicity and Durability.	**CO4**	**L3**	**6M**
		OR			
8		Explain ACID properties and illustrate them through examples	**CO4**	**L3**	**12M**
		UNIT-V			
9	**a**	What is Deadlock recovery? Explain the different methods in deadlock	**CO5**	**L4**	**6M**
	b	Explain in detail about Deadlock detection	**CO5**	**L2**	**6M**
		OR			
10	**a**	Discuss about failure with loss of non-volatile storage.	**CO5**	**L3**	**6M**
	b	Classify various levels of RAID with neat diagrams	**CO5**	**L3**	**6M**

*** END ***

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June-2025

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

(Common to CSM & CAD)

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	Explain the role of AI in Education and Finance.	**CO1**	**L2**	**6M**
		OR			
2	**a**	Define Intelligent system and Elaborate about its thinking ability.	**CO1**	**L1**	**6M**
	b	Explain the role of AI in Online and telephone customer service	**CO1**	**L2**	**6M**
		UNIT-II			
3	**a**	Illustrate general steps in Problem Solving in Artificial Intelligence.	**CO2**	**L2**	**6M**
	b	Explain in detail about Problem Solving in Control Strategies.	**CO2**	**L2**	**6M**
		OR			
4		Design 8 Queens's problem using State Space Search with example.	**CO2**	**L6**	**12M**
		UNIT-III			
5	**a**	Describe Propositional Logic along with its syntax and types.	**CO3**	**L2**	**6M**
	b	Prove { P →Q,Q→R } | - (P→R), i.e., P →R is a deductive consequence of { P →Q, Q→R } using Axiomatic System	**CO3**	**L5**	**6M**
		OR			
6	**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**
		UNIT-IV			
7	**a**	How representations and Mappings in KR is done? Explain.	**CO4**	**L2**	**6M**
	b	Describe the approaches to Knowledge Representation?	**CO4**	**L2**	**6M**
		OR			
8	**a**	Distinguish Inferential Knowledge Vs Procedural Knowledge.	**CO4**	**L4**	**6M**
	b	How non binary predicates are represented using semantic net. Explain with suitable example.	**CO4**	**L2**	**6M**
		UNIT-V			
9	**a**	What do you mean by expert system technology? Explain.	**CO5**	**L1**	**6M**
	b	Distinguish between forward chaining and backward chaining.	**CO5**	**L2**	**6M**
		OR			
10		Explain Components of Expert Systems in detail.	**CO5**	**L2**	**12M**

*** END ***

O.P.Code: 20CS1401	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS
CSE(Artificial Intelligence)

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

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

UNIT-I

1	a	Define Artificial Intelligence and Elaborate about its think ability	CO1	L1	6M
	b	How AI evolve over Tic – Tac – Toe Game Playing? Deduce with an example. Write a program for tic-tac-toe game playing.	CO1	L3	6M

OR

2	a	Explain the role of AI in Education and Finance.	CO1	L2	6M
	b	Explain the role of AI in Online and telephone customer service.	CO1	L2	6M

UNIT-II

3	a	Explain about BFS. Deduce it with an example. List the Pros and Cons in it.	CO2	L2	6M
	b	Write an example program for BFS using python.	CO2	L1	6M

OR

4	a	Explain about DFS. Deduce it with an example. List its Pros and Cons`.	CO2	L2	6M
	b	Write an example program for DFS using python.	CO2	L1	6M

UNIT-III

5	a	How representation of Simple Facts in Logic is done? Explain	CO3	L2	6M
	b	What are the Uses of predicate logic? Make use of it and analyze the how it can create Resolution for it.	CO3	L3	6M

OR

6	a	Write the algorithm of "Resolution in Propositional Logic" and explain with an example.	CO3	L1	6M
	b	What is set-of-support strategy and how predicate logic complements by making use of it.	CO3	L3	6M

UNIT-IV

7	a	Distinguish Inferential Knowledge Vs Procedural Knowledge	CO5	L2	6M
	b	How non binary predicates are represented using semantic net. Explain with suitable example.	CO5	L2	6M

OR

8	a	List the set of primitives and conceptual tenses used in Conceptual Dependency.	CO5	L2	6M
	b	List the ways in which classes are related to each other in frames, with suitable example.	CO5	L2	6M

UNIT-V

9		Discuss about Text Classification and its approaches.	CO6	L2	12M

OR

10		Explain Information Retrieval in AI.	CO6	L2	12M

*** END ***

O.P.Code: 20CE0160	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June 2025

FLUID MECHANICS & HYDRAULIC MACHINERY

(Agricultural Engineering)

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

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

		UNIT-I			
1	a	Differentiate between kinematic viscosity and dynamic viscosity. Give their dimensions.	CO1	L4	6M
	b	Calculate the density, specific weight, and weight of one liter of petrol with a specific gravity of 0.7.	CO1	L3	6M
		OR			
2	a	Explain the terms compressibility and bulk modulus.	CO1	L2	6M
	b	Obtain an expression for the capillary fall of a liquid.	CO1	L2	6M
		UNIT-II			
3		Derive Euler's equation of motion with a neat sketch.	CO2	L4	12M
		OR			
4	a	The water is flowing through a pipe having diameters of 20cm and 10cm at sections 1 and 2, respectively. The rate of flow through the pipe is 35 liters/s. Section 1 is 6 m above the datum, and section 2 is 4 m above the datum. If the pressure at section 1 is 39.24 N/cm2, find the intensity of pressure at section 2.	CO2	L4	8M
	b	Explain the Energy gradient line and the Hydraulic gradient line.	CO2	L2	4M
		UNIT-III			
5		A horizontal pipeline 40 m long is connected to a water tank at one end and discharges freely into the atmosphere at the other end. For the first 25 m of its length from the tank, the pipe is 150 mm in diameter, and its diameter is suddenly enlarged to 300 mm. The height of the water level in the tank is 8 m above the centre of the pipe. Considering all losses of head that occur, determine the rate of flow. Take f = 0.01 for both sections of the pipe.	CO3	L3	12M
		OR			
6		List out minor losses in pipe flow and write the equations for all minor losses.	CO3	L1	12M
		UNIT-IV			
7	a	A jet of water moving at 12 m/s impinges on a vane shaped to deflect the jet through 120° when stationary. If the vane is moving at 5 m/s, find the angle of the jet so that there is no shock at the inlet. What is the absolute velocity of the jet at exit in magnitude and direction, and the work done per second per unit weight of water striking per second? Assume that the vane is smooth.	CO4	L4	12M
		OR			
8		Derive an expression for jet strikes the curved plate at the centre and at one end tangentially when the plate is unsymmetrical.	CO4	L2	12M
		UNIT-V			
9		Derive the expression for velocity triangles and work done by the Pelton wheel with a neat sketch.	CO5	L2	12M
		OR			
10	a	A centrifugal pump delivers water against a net head of 14.5m and a design speed of 1000 r.p.m. The vanes of curved back to an angle of 30° with the periphery. The impeller diameter is 300mm and outlet width is 50mm.Determine the discharge of the pump if manometric efficiency is 95%.	CO5	L3	7M
	b	Explain pumps in series and parallel.	CO5	L2	5M

*** END ***

O.P.Code: 20CE0111	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
HYDRAULIC ENGINEERING
(Civil Engineering)

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

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

UNIT-I

1		Prove that for a channel of circular section, the depth of flow d=0.81D for maximum velocity.	CO1	L3	12M
		OR			
2		Derive an expression for maximum velocity of flow through a circular section.	CO1	L2	12M

UNIT-II

3		What is hydraulic jump and derive the expression for depth of hydraulic jump.	CO2	L2	12M
		OR			
4		What is back water curve and afflux? Derive the expression for length of back water curve.	CO2	L2	12M

UNIT-III

5		Derive the expression for force exerted by a jet on stationary curved plate if jet strikes the curved plate at the Centre and at one end.	CO3	L2	12M
		OR			
6		Obtain the expression for the force exerted by jet of water on a fixed vertical plate in the direction of the jet.	CO3	L3	12M

UNIT-IV

7		What is centrifugal pump? Explain the parts of centrifugal pump with neat sketch.	CO4	L1	12M
		OR			
8		Explain the different types of hydraulic similarities that must exist between aprototype and its model.	CO4	L2	12M

UNIT-V

9	a	What is a turbine and give the classification in detail? Give the various efficiencies.	CO5	L1	6M
	b	Explain Radial flow reaction turbine with a neat diagram.	CO5	L1	6M
		OR			
10	a	Define (i) Speed ratio (ii) Flow ratio (iii) Diameter of turbine (iv) Radial discharge.	CO5	L1	6M
	b	Define the term unit power, unit speed and unit discharge with reference to ahydraulic turbine. And also derive the expression for these terms.	CO5	L1	6M

*** END ***

Q.P.Code: 20EE0208	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations June-2025
ELECTRICAL POWER TRANSMISSION SYSTEMS
(Electrical & Electronics Engineering)

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

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

UNIT-I

1	a	Explain the different types of conductors briefly	CO1	L3	6M
	b	Explain the skin effect in transmission lines.	CO1	L3	6M
		OR			
2		Explain the internal and external flux linkages of a single current-carrying conductor.	CO1	L3	12M

UNIT-II

3	a	Derive the sending voltage and % voltage regulation in short transmission lines with a neat phasor diagram.	CO2	L3	6M
	b	Explain the different types of transmission lines	CO2	L3	6M
		OR			
4		A 100 km long, 3-phase, 50 Hz transmission line has following line constants: Resistance/ph/km=0.1ohm, Reactance/ph/km=0.5ohm, susceptance /ph/km=10×10e-6S.If the line supplies a load of 20 MW at 0.9 p.f lagging at 66 kV at the receiving end. Calculate (i) Sending end power factor (ii) % regulation (iii) Transmission efficiency by using the nominal T Method.	CO2	L3	12M

UNIT-III

5	a	Explain the potential distribution over a string of suspension insulator string.	CO3	L3	6M
	b	What is string efficiency? Explain any two methods for improving string efficiency.	CO3	L3	6M
		OR			
6		What are the methods of reducing the corona effect?	CO3	L3	12M

UNIT-IV

7	a	Derive the expression for sag for equal supports.	CO4	L3	6M
	b	A 132 kV transmission line has the following data: weight of conductor =680kg/km; length of span = 260m; ultimate strength =3100kg, safety factor=2, calculate height above the ground at which the conductor should be supported. Ground clearance is 10 meters.	CO4	L3	6M
		OR			
8		Define sag and Derive the expression for sag and tension when the supports are at unequal heights.	CO4	L3	12M

UNIT-V

9		Write short notes on (i) inter sheath grading and (ii) capacitance grading	CO5	L3	12M
		OR			
10		Explain the construction of underground cables.	CO5	L3	12M

***** END *****

O.P.Code: 20EC0409	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June-2025

ELECTRONIC CIRCUIT ANALYSIS

(Electronics & Communications Engineering)

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

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

		UNIT-I			
1	**a**	Draw the Hybrid-pi model and explain the significance of each and every component in it.	**CO1**	**L3**	**6M**
	b	Deduce the expression for Emitter diffusion capacitance of CE transistor at high frequency.	**CO4**	**L4**	**6M**
		OR			
2	**a**	Define Cascading in amplifiers and explain the need for cascading.	**CO1**	**L1**	**6M**
	b	Analyze an n-stage cascaded amplifier for its overall parameters with the help of a block diagram.	**CO5**	**L3**	**6M**
		UNIT-II			
3	**a**	Explain the basic concept of feedback in amplifier with suitable block diagram.	**CO1**	**L2**	**8M**
	b	List the characteristics of negative feedback amplifiers.	**CO1**	**L1**	**4M**
		OR			
4	**a**	An RC coupled amplifier has a mid-frequency gain of 200 and a frequency response from 100 Hz to 20 KHz. A negative feedback network with β = 0.02 is incorporated into the amplifier circuit. Estimate the new system performance.	**CO5**	**L4**	**6M**
	b	Explain the effect of negative feedback on input resistance for Current shunt and Voltage shunt Feedback amplifier.	**CO3**	**L2**	**6M**
		UNIT-III			
5	**a**	Explain the principle of working of an oscillator with suitable diagram and classify the various types of oscillators.	**CO3**	**L2**	**8M**
	b	Explain Barkhausen criterion.	**CO1**	**L2**	**4M**
		OR			
6	**a**	Explain the working of a Crystal oscillator and sketch its characteristics.	**CO3**	**L2**	**8M**
	b	In a Wein-bridge oscillator, if the value of R is 100 KΩ, and frequency of oscillation is 10 KHz, Calculate the value of capacitor C.	**CO6**	**L3**	**4M**
		UNIT-IV			
7	**a**	With neat diagram, explain Series fed directly coupled Class A Power Amplifier and determine its maximum efficiency.	**CO2**	**L2**	**6M**
	b	Discuss about Transformer coupled Class A Power Amplifier with diagram and determine its Maximum efficiency.	**CO2**	**L3**	**6M**
		OR			
8	**a**	Explain the operation of a single tuned capacitive coupled amplifier with necessary circuit diagrams.	**CO2**	**L4**	**6M**
	b	Explain the effect of cascading single tuned amplifiers on bandwidth.	**CO1**	**L3**	**6M**
		UNIT-V			
9	**a**	Define a Multivibrator and mention its types.	**CO1**	**L1**	**4M**
	b	With neat sketch, explain the working of a collector coupled Astable multivibrator.	**CO3**	**L2**	**8M**
		OR			
10	**a**	Explain briefly the operation of the Bistable multivibrator with a neat circuit diagram and draw waveforms.	**CO3**	**L2**	**8M**
	b	List the applications of the Bistable multivibrator.	**CO1**	**L1**	**4M**

***** END *****

Q.P.Code: 20CS0511 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
PYTHON PROGRAMMING
(Common to CSE,CSIT,CIC & CCC)

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

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

		UNIT-I			
1	**a**	Discuss about History of Python Language.	**CO1**	**L2**	**4M**
	b	List out the Features and Applications of Python.	**CO1**	**L1**	**8M**
		OR			
2	**a**	Explain about the Single-Valued data types in python.	**CO1**	**L2**	**6M**
	b	Discriminate about the Multi-Valued Data types with example.	**CO1**	**L5**	**6M**
		UNIT-II			
3	**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**	**L1**	**6M**
		OR			
4	**a**	Analyze the Python jump statements with suitable examples.	**CO2**	**L6**	**6M**
	b	Explain break, continue and Pass statement with the help of for loop with an example.	**CO2**	**L2**	**6M**
		UNIT-III			
5	**a**	Define function and explain the types of functions with an example.	**CO3**	**L1**	**6M**
	b	Discuss about key word arguments with example.	**CO3**	**L2**	**6M**
		OR			
6	**a**	Define Class and Object with example code.	**CO3**	**L1**	**6M**
	b	Analyze the term: Self-variable with code.	**CO3**	**L4**	**6M**
		UNIT-IV			
7	**a**	Describe about name spacing.	**CO4**	**L2**	**6M**
	b	Explain about the import statement in modules.	**CO4**	**L2**	**6M**
		OR			
8	**a**	Write a python code using try-except-else-finally statement in python.	**CO4**	**L3**	**6M**
	b	What is a Raising Exception? Write any user defined exception program with raising exception.	**CO4**	**L1**	**6M**
		UNIT-V			
9	**a**	Illustrate the Command line arguments.	**CO5**	**L3**	**6M**
	b	Explain the reading and writing files in python.	**CO5**	**L2**	**6M**
		OR			
10	**a**	Discuss the colors and filled shapes in python using turtle.	**CO5**	**L2**	**6M**
	b	Illustrate Python Runtime Services and Data Compression.	**CO5**	**L3**	**6M**

***** END *****

O.P.Code: 20CS0506	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to CAD, CSM, CAI)

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

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

		UNIT-I			
1	a	Illustrate Following operators With the suitable example. i) Bit-wise operator ii) Conditional operator	CO1	L3	6M
	b	Explain History and Evolution of Java?	CO1	L2	6M
		OR			
2		Write a Java program to read and display the elements of array.	CO2	L6	12M
		UNIT-II			
3	a	What is a package? How to create user defined package in java with example.	CO2	L1	6M
	b	Distinguish Method Overriding and Method Overloading.	CO2	L5	6M
		OR			
4		Write a java program to implement an interface using your own example.	CO2	L3	12M
		UNIT-III			
5		Write a java program to create own exception for Negative Value Exception if the user enter negative value.	CO3	L6	12M
		OR			
6	a	What is a String? Explain different String declarations with an example.	CO3	L2	6M
	b	Write a java program to check the given string is palindrome or not.	CO2	L6	6M
		UNIT-IV			
7	a	Write short notes on collection interfaces and their methods.	CO4	L6	6M
	b	Establish the following interfaces with java programs i) The Collection Interface ii) The Set iii) The Map.Entry	CO5	L3	6M
		OR			
8	a	How to create a file in java with example.	CO4	L6	6M
	b	How to Write and Read a file in java with an example	CO4	L3	6M
		UNIT-V			
9		Write a java Program to implement an AWT based calculator with basic operations.	CO6	L6	12M
		OR			
10		Explain the following methods in java. i) Default method ii) Static method iii) forEach() method	CO5	L2	12M

*** END ***

O.P.Code: 20CE0113	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June-2025

ENGINEERING GEOLOGY

(Civil Engineering)

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

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

UNIT-I

1	a	Explain the role of importance of geology in civil engineering.	CO1	L2	6M
	b	Describe chemical weathering in detail.	CO1	L1	6M
		OR			
2	a	What is weathering? Enumerate the various mechanisms of rock weathering.	CO1	L1	6M
	b	Distinguish between weathering and erosion.	CO1	L2	6M

UNIT-II

3	a	Discuss briefly the physical properties of Quartz and talc.	CO2	L2	6M
	b	Explain different methods of study of minerals.	CO2	L2	6M
		OR			
4	a	Write physical properties of Olivine and Hornblende minerals.	CO2	L1	6M
	b	Write physical properties of Calcite and Kyanite minerals.	CO2	L1	6M

UNIT-III

5	a	Describe the columnar flow and sheet structures of igneous rocks.	CO3	L2	6M
	b	Write detailed note on rock cycle.	CO3	L1	6M
		OR			
6	a	Explain the structures and textures of sedimentary rocks.	CO4	L2	6M
	b	What are the classification of igneous rocks?	CO4	L1	6M

UNIT-IV

7	a	What is an Unconformity? Describe different types of unconformities.	CO5	L1	8M
	b	Write a note on the Importance of unconformity.	CO5	L1	4M
		OR			
8	a	Explain in detail about Magnetic methods.	CO5	L2	8M
	b	Write a note on Magnetic method applications.	CO5	L1	4M

UNIT-V

9	a	Explain various investigation uses in groundwater exploration.	CO6	L2	6M
	b	Write down the geological control of ground water movement.	CO6	L1	6M
		OR			
10	a	What are dams.and types of dams.	CO6	L1	6M
	b	Explain the Narrow river valley.	CO6	L2	6M

***** END *****

O.P.Code: 20EE0209	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June-2025

POWER ELECTRONICS

(Electrical & Electronics Engineering)

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

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

	UNIT-I			
1	Draw and explain V-I Characteristics of Power Diode.	**CO1**	**L2**	**12M**
	OR			
2	Illustrate the Current commutation and draw the output wave forms.	**CO1**	**L4**	**12M**
	UNIT-II			
3	Describe the operation of single-phase Full wave converter with R-Load at α=45 with necessary wave forms. Also derive the output voltage, output current and RMS output voltages.	**CO2**	**L2**	**12M**
	OR			
4	Differentiate the half-controlled converter and fully controlled converter.	**CO2**	**L2**	**12M**
	UNIT-III			
5	Describe the step-down chopper with neat diagrams	**CO3**	**L2**	**12M**
	OR			
6	A DC chopper is connect to a 100V DC source supplies an inductive load having 40 mh in series with a resistance of 5ohms. A freewheeling diode is placed across the load. The load current varies between the limits of 10A and 12A. Determine the time ratio of the chopper.	**CO3**	**L3**	**12M**
	UNIT-IV			
7	Describe the principle of operation of single phase to single phase Bridge type step-down cycloconverter with Resistive Load.	**CO4**	**L2**	**12M**
	OR			
8	Illustrate the principle of operation of single phase to single phase step- down Bridge type cycloconverter with Resistive Inductive Load for Continuous Load Current.	**CO4**	**L4**	**12M**
	UNIT-V			
9	Describe about the single-phase half wave ac voltage controller with resistive load.	**CO5**	**L2**	**12M**
	OR			
10	Illustrate the operation of TRIAC with R and RL load.	**CO6**	**L4**	**12M**

***** END *****

O.P.Code:20ME0309 | R20 | H.T.No.

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

B.Tech. II Year II Semester Supplementary Examinations June-2025

MATERIALS SCIENCE

(Mechanical Engineering)

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

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

UNIT-I

			CO	L	M
1		Define the following terms: (i) Space lattice (ii) Unit cell (iii)primitive cell (iv) Bonding energy (v) Atomic packing factor (vi) crystal structure	CO1	L1	12M
		OR			
2		Evaluate the cooling curve of solidification of a pure metal with Diagram.	CO1	L5	12M

UNIT-II

			CO	L	M
3	a	Construct a phase diagram and explain briefly and list out different types of phase diagrams.	CO2	L6	6M
	b	Define invariant reactions in phase Diagram with examples.	CO2	L1	6M
		OR			
4	a	Evaluate Gibbs Phase rule, What are the uses of phase diagram	CO2	L4	6M
	b	Define single and multiphase solids with examples	CO2	L1	6M

UNIT-III

			CO	L	M
5		Evaluate Grey cast iron structure and properties.	CO3	L4	12M
		OR			
6		What are the notable properties of Copper and its alloys? And Draw copper-zinc equilibrium diagram explain it.	CO3	L1	12M

UNIT-IV

			CO	L	M
7		Name the various methods of heat treatment of steel. Briefly explain any one method.	CO4	L1	12M
		OR			
8		What are TTT diagrams? How they prepared? What is their significance?	CO4	L1	12M

UNIT-V

			CO	L	M
9		What are the various methods of component manufacture of composites? Briefly explain any one method.	CO5	L1	12M
		OR			
10		Compare the following composite material properties and its applications (i) Polymer matrix composites (ii) Metal matrix composites	CO5	L4	12M

*** END ***

O.P.Code: 20EC0410	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
DIGITAL COMMUNICATIONS
(Electronics and Communications Engineering)

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

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

UNIT-I

1	a	Explain fundamental limitations of Communication Systems.	CO1	L2	6M
	b	Compare Analog and DigitalCommunication.	CO1	L2	6M
		OR			
2	a	Explain the Process of Quantization through one Example?	CO1	L2	6M
	b	Discuss the different types of Quantization in Detail?	CO1	L2	6M
		UNIT-II			
3	a	What are the effects of ISI?	CO5	L1	6M
	b	Describe Eye pattern and construct the diagram.	CO2	L2	6M
		OR			
4	a	Explain in detail about modified duo binary signaling scheme?	CO4	L2	6M
	b	Describe the baseband M-array PAM Transmission system.	CO2	L2	6M
		UNIT-III			
5	a	Draw the block diagram of a most basic form of digital communication system.	CO1	L1	6M
	b	Illustrate optimum receiver for AWGN channel.	CO5	L2	6M
		OR			
6	a	Explain the Schwarz Inequality.	CO4	L2	6M
	b	Determine signal representation of a signal N=2and M=3.	CO4	L2	6M
		UNIT-IV			
7	a	Derive an expression for probability of error in BFSK.	C05	L3	6M
	b	What is Bandwidth of BPSK, BFSK?	C02	L1	6M
		OR			
8	a	Describe the generation and detection of DPSK.	C04	L2	6M
	b	A binary data stream 101101100 is to be transmitted using DPSK.	C04	L4	6M
		UNIT-V			
9	a	Explain the Convolutional Encoding and Decoding methods.	C03	L2	6M
	b	Discuss in brief about sequential decoding of convolutional codes.	C03	L2	6M
		OR			
10	a	What is forward error correction system and explain in detail?	C04	L1	6M
	b	Describe the matrix representation of linear block codes.	C05	L2	6M

***** END *****

O.P.Code: 20CI0603	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June-2025

UNIX & SHELL PROGRAMMING

(Computer Science & Information Technology)

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

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

		UNIT-I			
1	**a**	Describe in detail about the Architecture of UNIX.	**CO1**	**L2**	**6M**
	b	How can you say that Unix operating system provides more security than other operating systems.	**CO1**	**L2**	**6M**
		OR			
2	**a**	a) Describe the commands listed below: i) mkdir ii) rmdir iii) cat iv) cd	**CO1**	**L2**	**8M**
	b	Describe the commands listed below: i) head ii) tail	**CO1**	**L2**	**4M**
		UNIT-II			
3		Explain Variables with its Types and Options.	**CO2**	**L3**	**12M**
		OR			
4	**a**	What is an option? Mention at least three options and their use?	**CO2**	**L2**	**6M**
	b	what are the three unix commands used to compare the contents of file ? Explain each command in detail.	**CO2**	**L3**	**6M**
		UNIT-III			
5	**a**	What is K shell ? Explain startup scripts in K shell.	**CO3**	**L3**	**6M**
	b	What is an Environment variable ? List out the environment variables.	**CO3**	**L2**	**6M**
		OR			
6		List and explain the expressions involved in Korn shell.	**CO3**	**L3**	**12M**
		UNIT-IV			
7	**a**	Explain startup and shutdown scripts in C shell.	**CO4**	**L3**	**6M**
	b	What is C Shell ? Explain two Special files.	**CO4**	**L3**	**6M**
		OR			
8		Discuss about repetition statements and repetition control statements in C shell with examples.	**CO4**	**L2**	**12M**
		UNIT-V			
9		What is File structure ? Explain the file structure of UNIX.	**CO5**	**L3**	**12M**
		OR			
10		Briefly explain about the following system calls with syntax : link, symlink, unlink, stat, lstat, fstat.	**CO5**	**L3**	**12M**

***** END *****

O.P.Code: 20CS1001	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
CRYPTOGRAPHY AND DATA 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	a	Classify possible types of attacks in cryptography.	CO1	L1	6M
	b	What is security approache? Explain various methods of security approaches.	CO1	L1	6M
		OR			
2	a	Discuss Play fair cipher in Detail.	CO1	L2	6M
	b	Compare Encryption and Decryption Process.	CO1	L3	6M
		UNIT-IIL3			
3		Examine the general structure of DES with neat sketch.	CO2	L4	12M
		OR			
4	a	Establish Affine cipher Encryption and Decryption process using the keyword "MONARCHY" and keys a=3, b=5.	CO2	L3	6M
	b	Explain Double &Triple DES with keys.	CO2	L2	6M
		UNIT-III			
5	a	Explain the RSA algorithm. Compute cipher text for M=88, p=17, q=11, e=7.	CO3	L2	6M
	b	Examine the structure of X448 key exchange and its algorithms.	CO3	L4	6M
		OR			
6	a	Discuss about key scheduling and round transformation of IDEA.	CO3	L2	6M
	b	Infer the concept of Elgamal Cryptography algorithm.	CO3	L3	6M
		UNIT-IV			
7	a	Summarize (i) Salami attack. (ii) Trap Door	CO4	L3	6M
	b	Discuss Hash Functions and Two Simple Hashing functions in detail.	CO4	L2	6M
		OR			
8		What is security attack? Explain different Types of Security attacks.	CO4	L2	12M
		UNIT-V			
9	a	Examine Secure Hash Algorithm and applications.	CO5	L4	6M
	b	Infer the characteristics, working and components of Encapsulating security payloads.	CO5	L3	6M
		OR			
10	a	Differentiate between SHA1 and SHA2.	CO5	L4	6M
	b	Explain various types of Authentication Protocols and its advantages and disadvantages.	CO5	L3	6M

*** END ***

O.P.Code: 20CS0513	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
COMPUTER NETWORKS
(Common to CAD, CSM, CSE)

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

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

		UNIT-I			
1		Explain in detail about OSI reference model.	CO1	L2	12M
		OR			
2	a	Illustrate about Coaxial cable.	CO1	L3	6M
	b	Explain in detail about Fiber optic cable.	CO1	L2	6M
		UNIT-II			
3	a	Explain about the services provided by the Data link layer.	CO2	L2	6M
	b	List and explain any two Error correction methods.	CO2	L2	6M
		OR			
4	a	Write about Point to Point (PPP) protocol in detail.	CO2	L4	6M
	b	Write about CDMA protocol.	CO2	L4	6M
		UNIT-III			
5	a	Calculate the Shortest Path Algorithm considering an example.	CO3	L4	6M
	b	Explain in detail about Flooding.	CO3	L2	6M
		OR			
6	a	Sketch and explain in detail about IPV4protocol.	CO4	L3	6M
	b	Write about BGP– Exterior Gateway routing protocol.	CO3	L4	6M
		UNIT-IV			
7		Explain the three-way handshake protocols with suitable diagram.	CO5	L2	12M
		OR			
8	a	Write in detail about performance issues of transport layer.	CO4	L4	6M
	b	Sketch and explain in detail about User Datagram Protocol (UDP).	CO5	L3	6M
		UNIT-V			
9	a	Describe short notes on application layer.	CO6	L2	6M
	b	Illustrate in detail about function and structure of e-mail protocol.	CO6	L3	6M
		OR			
10	a	Write in detail about DNS Name Space and Domain Resource records.	CO6	L4	6M
	b	Explain about secure shell in application layer.	CO6	L2	6M

*** END ***

O.P.Code: 20CS0523	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations June-2025
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CCC & CAI)

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

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

		UNIT-I			
1	a	What do you mean by algorithm? List some of the properties of it	CO1	L1	6M
	b	Classify the rules of Pseudo code for Expressing Algorithms.	CO1	L2	6M
		OR			
2		Demonstrate Towers of Hanoi with algorithm and example.	CO1	L3	12M
		UNIT-II			
3		Explain techniques of binary trees with suitable example	CO2	L2	12M
		OR			
4		Analyze the working strategy of merge sort and illustrate the process of merge sort algorithm for the given data: 43, 32, 22, 78, 63, 57, 91 and 13.	CO2	L4	12M
		UNIT-III			
5		Explain in detail about general method of greedy method with algorithm and list the few applications of greedy method.	CO3	L2	12M
		OR			
6	a	Write short notes about general method of dynamic programming.	CO3	L3	3M
	b	Build any one application of dynamic programming with an example.	CO3	L6	9M
		UNIT-IV			
7		Distinguish in detail 8-queens problem using back tracking with state space tree.	CO4	L4	12M
		OR			
8	a	Explain the principles of FIFO branch and bound.	CO4	L2	6M
	b	Explain the principles of LIFO branch and bound.	CO4	L2	6M
		UNIT-V			
9		Construct the non-deterministic algorithms with suitable example.	CO5	L3	12M
		OR			
10	a	Statement the following with examples i) Optimization problem . ii) Decision problem .	CO5	L4	6M
	b	Explain and shows the relationship between P,NP,NP Hard and NP Complete with neat diagram.	CO5	L3	6M

*** END ***

O.P.Code: 20CE0114	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
GEOTECHNICAL ENGINEERING
(Civil Engineering)

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

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

		UNIT-I			
1	a	Classify various types of soil structures occur in nature with neat sketch.	CO1	L3	6M
	b	Explain clay mineralogy with neat sketch.	CO1	L2	6M
		OR			
2	a	Write short notes on Index Properties of soils.	CO1	L3	6M
	b	Explain in detail the laboratory method for particle size distribution of coarse grained soils by dry sieve analysis.	CO1	L5	6M
		UNIT-II			
3	a	Differentiate between compaction and consolidation.	CO2	L4	6M
	b	Differentiate between Standard proctor test and Modified proctor test.	CO2	L4	6M
		OR			
4		What is consolidation? Describe briefly various types of consolidation of soils.	CO2	L1	12M
		UNIT-III			
5	a	What do you understand by 'Pressure bulb'? Illustrate with sketches.	CO3	L1	6M
	b	Explain vertical stress under line load,strip load, circular load and rectangular area with neat sketch.	CO3	L5	6M
		OR			
6		Describe the vane shear test with a neat sketch.	CO4	L2	12M
		UNIT-IV			
7	a	What are the factors causing the slope failures?	CO5	L1	6M
	b	Explain different types of slope failures with neat sketches.	CO5	L2	6M
		OR			
8		A canal is to be excavated through a soil with c = 15 kN/m2 , φ= 20o , e = 0.9 and G = 2.67. The side slope is 1 in 1. The depth of the canal is 6 m. determine the factor of safety with respect to cohesion when the canal runs full. What will be the factor of safety if the canal is rapidly emptied.	CO5	L4	12M
		UNIT-V			
9	a	What are the different stages in sub soil exploration?	CO6	L2	6M
	b	Explain various uses of site investigations.	CO6	L2	6M
		OR			
10		Give a detailed account on how Standard Penetration Test is conducted. What are the relevant corrections applied to SPT number?	CO6	L1	12M

*** END ***

O.P.Code: 20EE0210	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
ELECTRICAL MACHINES-II
(Electrical and Electronics Engineering)

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

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

		UNIT-I			
1		Explain the construction and working principle of 1-ϕ transformer.	**CO1**	**L2**	**12M**
		OR			
2	**a**	Explain the equivalent circuit of a single-phase transformer referred to the primary side.	**CO1**	**L2**	**6M**
	b	A single-phase transformer has 500 primary and 1200 secondary turns. The net cross-sectional area of the core is 80cm^2. If the primary winding is connected to 50Hz supply at 500V, calculate the value of maximum flux density on core and the emf induced in the secondary.	**CO1**	**L2**	**6M**
		UNIT-II			
3		Explain the 1-ϕ auto transformers in detail with a neat diagram.	**CO2**	**L2**	**12M**
		OR			
4		Obtain the approximate equivalent circuit of a given 200/2000V, 1-ϕ, 25KVA transformer having the following test results. OC test : 200V, 6A, 350W on LV side. SC test : 70 V, 15A, 600W on HV side.	**CO2**	**L3**	**12M**
		UNIT-III			
5		Explain the production of rotating magnetic field in a 3-ϕ induction motor with a graphical presentation.	**CO3**	**L2**	**12M**
		OR			
6	**a**	Explain rotor current frequency of the induction motor.	**CO3**	**L2**	**6M**
	b	Explain the power flow diagram of the induction motor.	**CO3**	**L2**	**6M**
		UNIT-IV			
7		Explain no-load and blocked rotor tests of a 3-ϕ induction motor.	**CO4**	**L3**	**12M**
		OR			
8	**a**	Explain Torque-Slip Characteristics of a 3-ϕ induction motor.	**CO4**	**L2**	**6M**
	b	Explain the terms Crawling and Cogging in a 3-ϕ induction motor.	**CO4**	**L2**	**6M**
		UNIT-V			
9		Explain the double field revolving theory of a 3-ϕ induction motor.	**CO5**	**L2**	**12M**
		OR			
10	**a**	Explain why the single-phase induction motor is not self-starting.	**CO5**	**L2**	**6M**
	b	List out the applications of single-phase induction motor.	**CO5**	**L2**	**6M**

***** END *****

O.P.Code: 20ME0308	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
MANUFACTURING PROCESSES
(Mechanical Engineering)

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

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

UNIT-I

1	a	List the main advantages and applications of the casting process.	CO1	L1	6M
	b	What are the major limitations of the sand casting process and how are they overcome?	CO1	L2	6M

OR

2	a	Sketch the cross section of a sand mould which is ready for pouring, and label the various important parts.	CO1	L3	6M
	b	Briefly explain the procedure to be followed for making a sand mould.	CO1	L2	6M

UNIT-II

3	a	Explain the working of oxy acetylene gas welding	CO2	L2	6M
	b	Distinguish three types of welding flames and for what applications these are used.	CO2	L2	6M

OR

4	a	Compare TIG and MIG welding processes.	CO2	L1	6M
	b	Explain the classification of welding processes briefly.	CO2	L2	6M

UNIT-III

5	a	Discuss the different types of rolling mills with a neat sketch.	CO3	L3	6M
	b	Write the advantages and disadvantages of rolling processes?	CO3	L2	6M

OR

6	a	What is bulk deformation process?	CO3	L2	6M
	b	List out the applications of hot rolling and cold rolling process.	CO3	L2	6M

UNIT-IV

7	a	What are the characteristics of sheet metal?	CO4	L3	6M
	b	What are the various types of shearing operations?	CO4	L2	6M

OR

8	a	Explain bending operations with suitable sketches.	CO4	L2	6M
	b	Sketch & explain the Drawing operation.	CO4	L2	6M

UNIT-V

9	a	Explain the working principles and application of compression Moulding.	CO5	L3	6M
	b	Explain the working principles and application of Rotational Moulding.	CO5	L1	6M

OR

10	a	Explain the structure of thermo plastic and thermosetting plastics.	CO5	L2	6M
	b	Explain the polymerization briefly.	CO5	L2	6M

***** END *****

O.P.Code: 20EC0411	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June-2025

LINEAR & DIGITAL IC APPLICATIONS

(Electronics & Communications Engineering)

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

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

		UNIT-I			
1	**a**	Compare and contrast the ideal and practical Op-Amp of IC 741.	**CO3**	**L2**	**6M**
	b	Determine the output voltage of a differential Amplifier for the input voltages of 300μV & 240μV.The Differential gain of the amplifier is 5000.the value of the CMRR is 100.	**CO3**	**L2**	**6M**
		OR			
2	**a**	With neat sketch explain the operation of an Instrumentation amplifier.	**CO4**	**L3**	**8M**
	b	Explain the operation of an Inverting A.CAmplifier.	**CO4**	**L2**	**4M**
		UNIT-II			
3	**a**	Define Oscillator. List thet ypes of oscillators.	**CO1**	**L1**	**4M**
	b	Derive the frequency of RC phase shift oscillator using Op-Amp.	**CO4**	**L3**	**8M**
		OR			
4	**a**	With the help of schematic diagram explain how 555 timer can be used as Mono stable multivibrator.	**CO4**	**L4**	**6M**
	b	Explain the operation of Astable multivibrator using 555 timer and also derive the expression for frequency of oscillation.	**CO4**	**L2**	**6M**
		UNIT-III			
5	**a**	Draw and explain the weighted resistor DAC.	**CO4**	**L2**	**6M**
	b	Draw and explain the operation of R-2R DAC.	**CO4**	**L2**	**6M**
		OR			
6		Draw and explain successive approximation type ADC with an Example.	**CO5**	**L2**	**12M**
		UNIT-IV			
7	**a**	Explain about libraries and packages	**CO5**	**L2**	**6M**
	b	Write the syntax for functions and procedures with an example?	**CO6**	**L1**	**6M**
		OR			
8	**a**	Explain the behavioral design elements of VHDL	**CO5**	**L2**	**6M**
	b	What is the importance of time dimension in VHDLand explain.	**CO5**	**L2**	**6M**
		UNIT-V			
9	**a**	Explain the operation of standard IC for 3X8 decoder with necessary truth table and internal architecture.	**CO6**	**L2**	**6M**
	b	Distinguish between the synchronous and asynchronous counters.	**CO6**	**L1**	**6M**
		OR			
10		Design an 8 -bit serial in and serial out shift register and write a VHDL code for it.	**CO6**	**L4**	**12M**

***** END *****

O.P.Code: 20HS0812	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Supplementary Examinations June-2025

MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

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

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

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

UNIT-I

1	a	Identify nature of managerial economics through its definitions.	CO1	L2	6M
	b	Analyze the significance of managerial economics in decision-making.	CO1	L3	6M
		OR			
2		Evaluate various methods of demand forecasting techniques.	CO1	L4	12M

UNIT-II

3	a	Define production function. Explain production function with one variable input.	CO2	L2	6M
	b	Explain the law of returns with appropriate examples.	CO2	L2	6M
		OR			
4		A firm has Fixed Cost of Rs 10000/-, selling price per unit is Rs.5/- and variable cost per unit is Rs. 3/- (i)Determine Break Even Point in terms of Volume and also Sales Value (ii)Calculate the Margin of safety considering that the actual production is 8000 units.	CO2	L4	12M

UNIT-III

5	a	Discuss various characteristics of market.	CO3	L2	6M
	b	State the features of Imperfect competition.	CO3	L2	6M
		OR			
6		Illustrate the price and output determination in case of monopoly.	CO3	L2	12M

UNIT-IV

7		Define capital budgeting. Explain the various methods of Capital Budgeting.	CO4	L2	12M
		OR			
8		Consider the case of the company with the following two investment alternatives each costing Rs.9 lakhs. The details of cash inflows are as follows:	CO4	L5	12M

Year	1	2	3
Project1	3,00,000	5,00,000	6,00,000
Project2	6,00,000	3,00,000	4,00,000

Estimated cost of capital is 10% per year. Determine NPV for the two projects.

UNIT-V

9	a	What is meant by Ratio analysis?	CO5	L1	6M
	b	Explain briefly about various types of ratios.	CO5	L2	6M
		OR			
10		Write short notes on Inventory Turnover Ratio and Inventory holding periods. And also calculate with following data. A Firm sold goods worth Rs 5, 00,000 and its gross profit is 20 percent of sales value. The inventory at the beginning of the year was Rs 16000 and at end of the year was Rs 14000.	CO5	L5	12M

***** END *****

O.P.Code: 20CE0115	R20	H.T.No.										

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
STRUCTURAL ANALYSIS
(Civil Engineering)

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

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

UNIT-I

1	Derive an expression for maximum positive/negative shear force and maximum bending moment for a simply supported beam subjected to two point loads W_1 and W_2 with a constant spacing between them.	**CO1**	**L2**	**12M**

OR

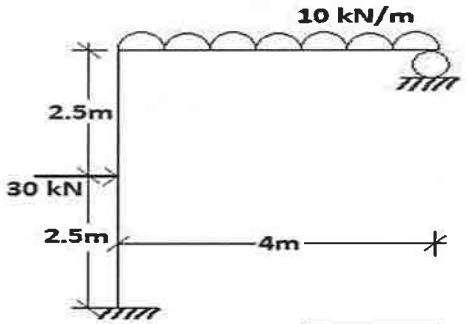
2	Four point loads of 120kN, 160kN, 160kN and 80kN spaced 2m between consecutive loads move on a girder of 25m span from left to right with 120kN load leading. Calculate the maximum bending moment, maximum +ve & –ve hear force at a point of 10m from the left support. Also calculate the position & value of absolute maximum bending moment.	**CO1**	**L3**	**12M**

UNIT-II

3	State and derive Castigliano's first theorem.	**CO2**	**L2**	**12M**

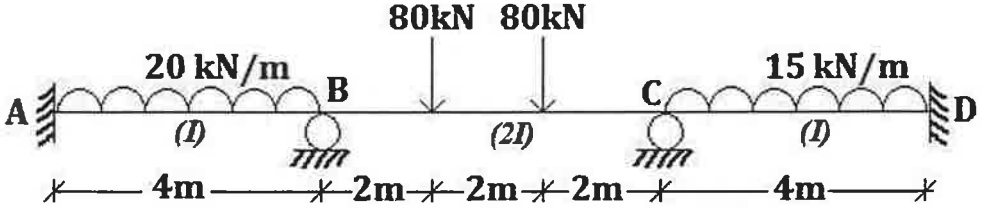
OR

4	Using the method of virtual work, determine the horizontal displacement of a point C of the frame shown in the figure. Take $E = 2 \times 10^5$ N/mm2 and $I = 4 \times 10^6$ mm^4.	**CO2**	**L4**	**12M**



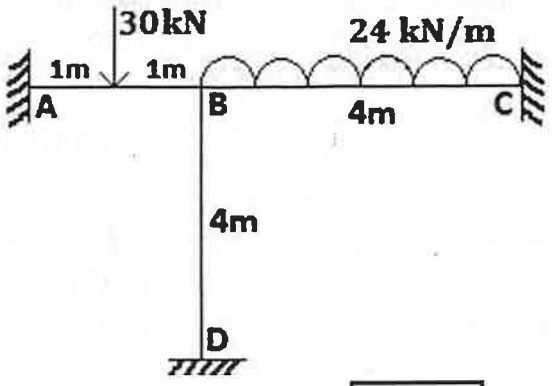
UNIT-III

5	Analyse the continuous beam loaded as shown in the figure by slope deflection method and sketch the bending moment diagram	**CO3**	**L4**	**12M**



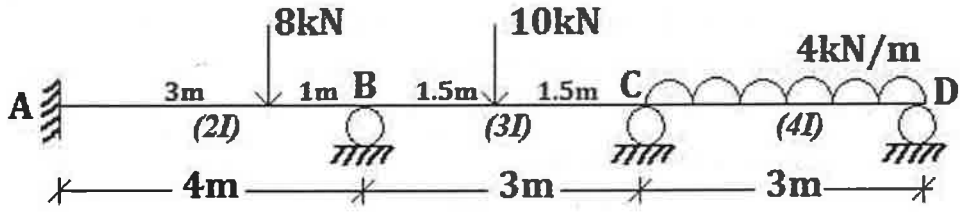
OR

6 Analyse the frame shown below. Assume uniform flexural rigidity. CO3 L4 12M



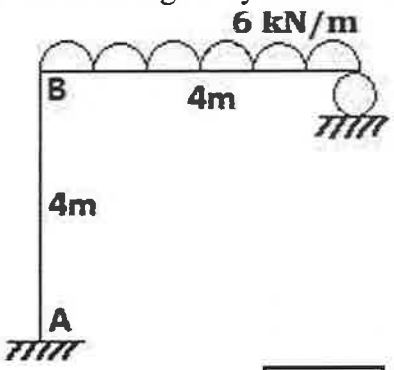
UNIT-IV

7 Analyse the continuous beam ABCD shown in the figure by moment distribution procedure. CO4 L4 12M



OR

8 Analyse the frame shown in the figure by moment distribution method. CO4 L4 12M

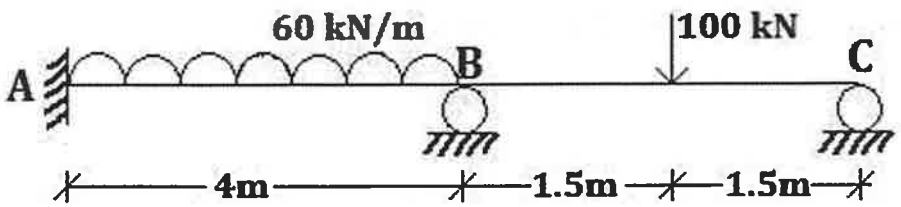


UNIT-V

9 Explain the steps involved in Flexibility matrix and Stiffness methods of analysis. CO5 L2 12M

OR

10 Analyse the continuous beam shown in the figure using flexibility matrix method. CO5 L4 12M



*** END ***

O.P.Code: 20CS0512	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
FORMAL LANGUAGES AND AUTOMATA THEORY
(Common to CSE & CSIT)

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

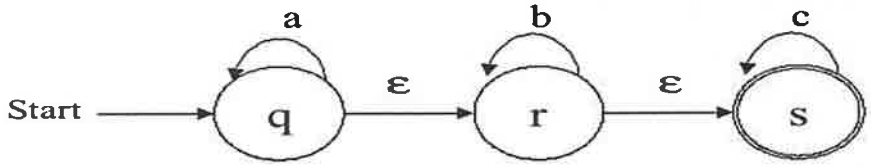
(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Define relations on sets and explain its properties with an example.	CO1	L1	6M
	b	State what is meant by finite automata and discuss the Applications and Limitations FA.	CO1	L3	6M

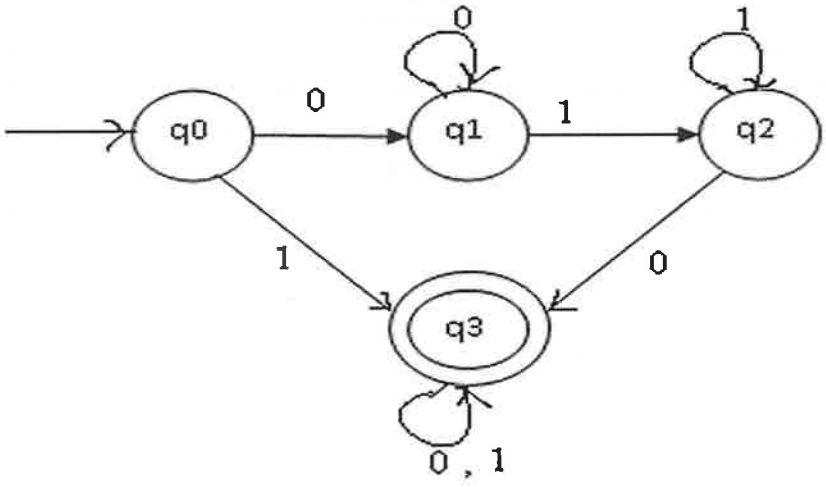
OR

2		Convert the following NFA with ε moves to NFA without ε moves by ε closure method.	CO1	L3	12M



UNIT-II

3	a	Prove R=Q+RP has unique solution, R=QP*	CO3	L3	4M
	b	Construct RE from given FA by using Arden's Theorem.	CO3	L6	8M



OR

4	a	State Pumping lemma for regular languages .	CO3	L1	4M
	b	Prove that L = {aibi | i ≥ 0} is not regular.	CO3	L3	8M

UNIT-III

5	a	State what is meant by derivation and parse tree with examples.	CO4	L1	4M
	b	Remove Left recursion from the grammar S→Sab/T T→Tcd/F F→Fa/G	CO4	L3	8M

OR

6	a	Evaluate simplification of the grammar for the following context free grammar. S→Aa /B B→a/bc C→a / ϵ	CO4	L5	8M
	b	List the closure properties of CFLs.	CO4	L1	4M

UNIT-IV

7	a	Explain acceptance of PDA with empty stack.	CO5	L5	6M
	b	Construct PDA from the following Grammar. S→aB B→bA/b A→aB	CO5	L5	6M

OR

8		Write the process adapted and convert the given PDA into an equivalent CFG. $\delta(q_0,a_0,z_0) \rightarrow (q_1,z_1z_0)$ $\delta(q_0,b,z_0) \rightarrow (q_1,z_2z_0)$ $\delta(q_1,a,z_1) \rightarrow (q_1, z_1z_1)$ $\delta(q_1,b,z_1) \rightarrow (q_1, \lambda)$ $\delta(q_1,b,z_2) \rightarrow (q_1,z_2z_2)$ $\delta(q_1,a,z_2) \rightarrow (q_1, \lambda)$ $\delta(q_1, \lambda,z_2) \rightarrow (q_1, \lambda)$ // accepted by the empty stack.	CO5	L3	12M

UNIT-V

9	a	State Turing machine.	CO6	L1	2M
	b	Construct a Turing machine that recognizes the language L={an bn, n>1}. Show an ID for the string 'aaabbb' with tape symbols.	CO6	L6	10M

OR

10	a	Discriminate Universal Turing machine.	CO6	L5	6M
	b	Constructa TM for regular Expression 01(00+11)(0+1)*1.	CO6	L6	6M

***** END *****

O.P.Code: 20ME0310	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
THEORY OF MACHINES
(Common to ME & AGE)

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

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

UNIT-I

1	**a**	Explain the effect of gyroscopic couple on a Aeroplane	**CO1**	**L2**	**4M**
	b	An aircraft makes a half circle of 50 m radius towards left, when flying at 200 km/hr. The engine and the propeller of the plane has a mass of 400 kg and a radius of gyration of 0.3 m. The engine rotates at 2400 rpm clockwise when viewed from the rear. Find the gyroscopic couple and its effect on the aircraft.	**CO1**	**L3**	**8M**
		OR			
2		The turning moment diagram for a multi cylinder engine has been drawn to a scale 1 mm = 600 N-m vertically and 1 mm = 3° horizontally. The intercepted areas between the output torque curve and the mean resistance line, taken in order from one end, are as follows: + 52, – 124, + 92, – 140, + 85, – 72 and + 107 mm2, when the engine is running at a speed of 600 r.p.m. If the total fluctuation of speed is not to exceed ± 1.5% of the mean, find the necessary mass of the flywheel of radius 0.5 m.	**CO1**	**L3**	**12M**

UNIT-II

3		Explain the working of a single-plate clutch with neat sketch	**CO2**	**L1**	**12M**
		OR			
4		A centrifugal clutch is to transmit 15 kW at 900 r.p.m. The shoes are four in number. The speed at which the engagement begins is 3/4th of the running speed. The inside radius of the pulley rim is 150 mm and the center of gravity of the shoe lies at 120 mm from the center of the spider. The shoes are lined with Ferrodo for which the coefficient of friction may be taken as 0.25. Determine 1. Mass of the shoes, and 2. Size of the shoes, if angle subtended by the shoes at the center of the spider is 60° and the pressure exerted on the shoes is 0.1 N/mm^2.	**CO2**	**L3**	**12M**

UNIT-III

5	**a**	Calculate the vertical height of a Watt governor when it rotates at 60 r.p.m. Also find the change in vertical height when its speed increases to 61 r.p.m.	**CO3**	**L1**	**10M**
	b	What is meant by Sensitiveness of governors?	**CO3**	**L1**	**2M**
		OR			
6		A Proell governor has equal arms of length 300 mm. The upper and lower ends of the arms are pivoted on the axis of the governor. The extension arms of the lower links are each 80 mm long and parallel to the axis when the radii of rotation of the balls are 150 mm and 200 mm. The mass of each ball is 10 kg and the mass of the central load is 100 kg. Determine the range of speed of the governor.	**CO3**	**L3**	**12M**

UNIT-IV

7	a	Four masses m1, m2, m3, and m4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radii of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively and the angles between successive masses are 45°, 75° and 135°. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2 m.	**CO4**	**L3**	**10M**
	b	Define Swaying couple?	**CO4**	**L1**	**2M**

OR

8	a	Derive the following expression of effects of partial balancing in two cylinder locomotive engine (i) Variation of attractive force (ii) Swaying couple (iii) Hammer blow	**CO4**	**L3**	**10M**
	b	Why rotating masses are to be dynamically balanced?	**CO4**	**L1**	**2M**

UNIT-V

9		A shaft of length 0.75 m, supported freely at the ends, is carrying a body of mass 90 kg at 0.25 m from one end. Find the natural frequency of transverse vibration. Assume E = 200 GN/m2 and shaft diameter = 50 mm.	**CO5**	**L3**	**12M**

OR

10	a	Derive the Natural Frequency of Free Torsional Vibrations.	**CO5**	**L3**	**10M**
	b	Define resonance.	**CO5**	**L1**	**2M**

***** END *****

O.P.Code: 20HS0833	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations June-2025
NUMERICAL METHODS, PROBABILITY & STATISTICS
(Common to CE & AGE)

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

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

UNIT-I

1	Find a root of the equation, $xe^x - \cos x = 0$, by applying the Newton-Raphson method correct to 4 decimal places.	CO1	L3	12M

OR

2	Using Newton's forward formula, find f(1.4) for the following data:	CO1	L3	12M

x	1.1	1.3	1.5	1.7	1.9
y	0.21	0.69	1.25	1.89	2.61

UNIT-II

3	Determine the value of y when $x = 0.1$ and $x = 0.2$ by R-K method of 4th order, given that $\frac{dy}{dx} = x^2 - y,\ y(0) = 1$.	CO2	L3	12M

OR

4	Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by taking 6 subintervals (i) Trapezoidal rule (ii) Simpson's $\frac{1}{3}$ rule (iii) Simpson's $\frac{3}{8}$ rule	CO2	L3	12M

UNIT-III

5	Calculate the first four moments of the following distribution about the mean:	CO3	L4	12M

x	0	1	2	3	4	5	6	7	8
f	1	8	28	56	70	56	28	8	1

Also calculate β_1 and β_2.

OR

6	In a bolt factory machines manufacture 25%, 35% and 40% of the total. Of their output 5%, 4% and 2% are defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines A, B, C	CO3	L3	12M

UNIT-IV

7	A random variable 'X' has the following distribution:	CO4	L4	12M

$X = x$	0	1	2	3	4	5	6	7
$p(X = x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$2k^2 + k$

Find (i) the value of the constant 'k', (ii) $p(3 < X \le 6)$ (iii) mean (iv) variance of 'X'

OR

8	If $f(x) = k(4x - 2x^2)$; $0 < x < 2$ then find (i) the constant k (ii) mean (iii) variance	CO4	L3	12M

UNIT-V

9	a	Out of 800 families with 5 children each, how many would you expect to have 4 boys, 3 girls, either 2 or 3 boys? Assume equal probabilities for boys and girls.	CO5	L3	6M
	b	If 'X' is a Poisson variate $p(X=2)=\frac{2}{3}p(X=1)$ finds $p(X=0)$ and $p(X=3)$.	CO5	L3	6M

OR

10	Three Judges in the following order rank ten competitors in a beauty contest. Use rank correlation which pair of Judges has the nearest approach to common tastes in beauty.	CO5	L3	12M

Ranks by A	1	6	5	10	3	2	4	9	7	8
Ranks by B	3	5	8	4	7	10	2	1	6	9
Ranks by C	6	4	9	8	1	2	3	10	5	7

*** END ***

O.P.Code: 20HS0836	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations June-2025
DISCRETE MATHEMATICS
(CSE, CSIT, CIC, CCC, CAD, CSM, CAI)

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

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

UNIT-I

1	a	Explain indegree and out degree of a graph. Also explain about the adjacency matrix representation of graphs. Illustrate with an example?	CO1	L2	6M
	b	Draw the graph represented by the following adjacency matrices: (i) $\begin{bmatrix} 1 & 2 & 0 & 1 \\ 2 & 0 & 3 & 0 \\ 0 & 3 & 1 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$ (ii) $\begin{bmatrix} 1 & 0 & 2 & 1 \\ 0 & 1 & 1 & 2 \\ 2 & 1 & 1 & 0 \\ 1 & 2 & 0 & 1 \end{bmatrix}$.	CO1	L2	6M

OR

2	a	Explain about complete graph & complete bipartite graph with example.	CO1	L2	6M
	b	Explain the Rooted tree and Spanning tree with an example.	CO1	L2	6M

UNIT-II

3	a	Construct the truth table for the following formula $\neg(\neg P \vee \neg Q)$ v (R→Q).	CO2	L3	6M
	b	Construct the truth table to Show that $\neg P \wedge (Q \wedge P)$ is a contradiction.	CO2	L3	6M

OR

4	a	Obtain PCNF of $A = (p \wedge q) \vee (\neg p \wedge q) \vee (q \wedge r)$ by constructing PDNF.	CO2	L5	6M
	b	Define Maxterms &Minterms of P & Q & give their truth tables.	CO2	L2	6M

UNIT-III

5		Let A be a given finite set and P(A) its power set . let $\subseteq$ be the inclusion relation on the elements of P(A).Draw the Hasse diagram of (P(A) , $\subseteq$) for A = { a } ii)A ={ a, b} iii) A = { a, b, c } iv) A = { a, b, c, d }.	CO3	L2	12M

OR

6	a	Show that the set{1,2,3,4,5} is not a group under addition and multiplication modulo 6.	CO4	L2	6M
	b	Show that the binary operation * defined on $(R,*)$ where $x * y = x^y$ is not associative.	CO4	L2	6M

UNIT-IV

7	a	Enumerate the number of non negative integral solutions to the inequality $x_1 + x_2 + x_3 + x_4 + x_5 \leq 19$.	CO5	L3	6M
	b	How many integral solutions are there to $x_1+x_2+x_3+x_4+x_5=20$ where each (i) $x_i \geq 2$ (ii) $x_i > 2$.	CO5	L3	6M

OR

8	a	Applying pigeon hole principle show that of any 14 integers are selected from the set S = {1, 2, 3… 25 } there are atleast two whose sum is 26. Also write a statement that generalizes this result.	CO5	L2	6M
	b	Show that if 8 people are in a room, at least two of them have birthdays that occur on the same day of the week.	CO5	L2	6M

UNIT-V

9	a	Solve $a_n = a_{n-1} + f(n)\ for\ n \geq 1$ by using substitution method.	CO6	L3	6M
	b	Determine the coefficient of $x^{20}\ in\ (x^3 + x^4 + x^5 + \cdots)^5$.	CO6	L3	6M

OR

10	a	Solve $a_n - 7a_{n-1} + 10a_{n-2} = 4^n$.	CO6	L3	6M
	b	Solve $\boldsymbol{a_n = a_{n-1} + 2a_{n-2}\ n \geq 2}$ with the initial condition $a_0 = 2, a_1 = 1$.	CO6	L3	6M

***** END *****

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations June-2025
CONTROL SYSTEMS
(Electronics and Communications Engineering)

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

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

UNIT-I

1	Find the transfer function of Armature controlled DC Motor.	**CO2**	**L3**	**12M**
	OR			
2	Obtain the overall gain C(S)/R(S) from signal flow graph shown in fig.1	**CO2**	**L4**	**12M**

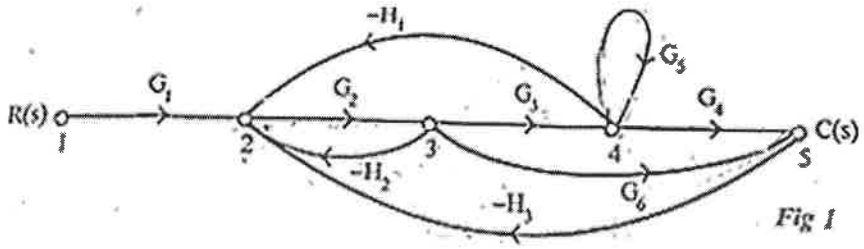


Fig 1

UNIT-II

3	List out the time domain specifications and derive the expressions for Rise time, Peak time and Peak overshoot.	**CO3**	**L2**	**12M**
	OR			
4	A positional control system with velocity feedback shown in fig 1. What is the response c(t) of the system for unit step input?	**CO3**	**L4**	**12M**

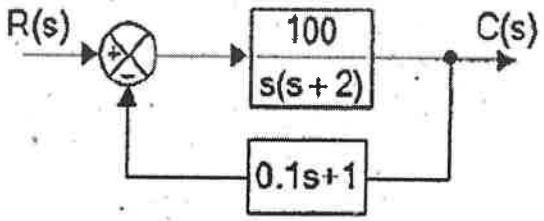


Fig 1 : Positional control system.

UNIT-III

5	Find the range of K for stability of unity feedback system whose open loop transfer function is G(s) = $\frac{K}{S(S+1)(S+2)}$ using Routh's stability criterion.	**CO5**	**L3**	**12M**
	OR			
6	Develop the root locus of the system whose open loop transfer function is G(S)= $\frac{K(S+9)\|}{S(S^2+4S+11)}$	**CO5**	**L4**	**12M**

UNIT-IV

7	**a**	Define and derive the expression for resonant frequency	**CO4**	**L1**	**6M**
	b	Given ξ = 0.7 and ω_n = 10 rad/sec. Find resonant peak, resonant frequency and bandwidth.	**CO4**	**L3**	**6M**

OR

8		Sketch the polar plot for the open loop transfer function of a unity feedback system is given by G(s) $=\frac{1}{S^2(1+S)(1+2S)}$ Determine Gain Margin & Phase Margin.	CO4	L4	12M

UNIT-V

9		Determine the Solution for Homogeneous and Non homogeneous State equations.	CO6	L3	12M

OR

10	a	Explain the properties of STM.	CO6	L2	6M
	b	For the state equation: $\dot{X}=\begin{pmatrix}1 & 0\\ 1 & 1\end{pmatrix}X+\begin{pmatrix}0\\1\end{pmatrix}U$ when, $\mathbf{X(0)}=\begin{pmatrix}1\\0\end{pmatrix}$ Find the solution of the state equation for the unit step input.	CO6	L1	6M

*** END ***