SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE & CSIT)

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

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

UNIT-I

1	a	What is asymptotic notation? Explain different types of notations with examples?	CO1	L2	6M
	b	What do you mean by algorithm? List some of the properties of it.	CO1	L1	6M

OR

2	Demonstrate Towers of Hanoi with algorithm and example.	CO1	L3	12M

UNIT-II

3	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

OR

4	a	Compare between BFS and DFS techniques.	CO2	L4	6M
	b	Solve an algorithm for techniques of binary trees with examples.	CO2	L3	6M

UNIT-III

5	Apply the minimum spanning tree of the following graph using Kruskals algorithm and prims algorithm.	CO3	L3	12M
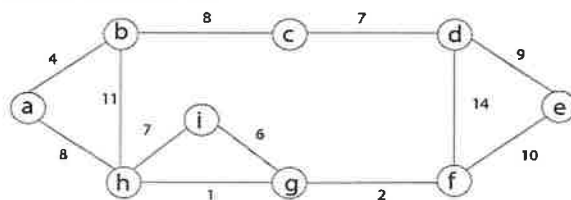
OR

6	a	Explain in detail about greedy method and its applications.	CO3	L2	6M
	b	Simplify the algorithm for Knapsack problem and analyze time complexity.	CO3	L4	6M

UNIT-IV

7	Distinguish in detail 8-queens problem using back tracking with state space tree.	CO4	L4	12M

OR

8	Discuss the Hamiltonian cycle algorithm with step by step operation with example.	CO4	L6	12M

UNIT-V

9	Explain the class of P and NP with example.	CO5	L2	12M

OR

10	Differentiate between NP- complete and NP-hard problems.	CO5	L4	12M

*** END ***

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 CSE & CSIT)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1	a	Define Data mining? Explain about data mining on what kind of data.	CO1	L1	6M
	b	Compare Data Warehousing and Data Mining.	CO1	L5	6M

OR

2	a	What is Data Reduction? Discuss in brief.	CO1	L1	6M
	b	Determine the concept hierarchy generation for categorical data.	CO1	L4	6M

UNIT-II

3		Discuss in brief about schemas in multidimensional data model.	CO2	L6	12M

OR

4	a	Explain in detail about Fact constellation schema with an example.	CO2	L5	6M
	b	Distinguish between OLTP and OLAP.	CO2	L5	6M

UNIT-III

5	a	Discuss about Basic Concepts of Frequent Itemset mining.	CO3	L6	6M
	b	What are the advantages of FP-Growth algorithm?	CO3	L1	6M

OR

6		Describe the steps involved in improving the efficiency of the Apriori algorithm.	CO3	L2	12M

UNIT-IV

7		Outline the concept of Classification by Decision Tree Induction.	CO4	L2	12M

OR

8	a	Explain about Bayesian belief networks with an example.	CO4	L5	6M
	b	Summarize about attribute selection measures.	CO4	L2	6M

UNIT-V

9	a	Inference the working of k-means clustering.	CO5	L4	6M
	b	Compare Agglomerative and Divisive hierarchical clustering.	CO5	L5	6M

OR

10	a	Discuss in detail about the Applications and trends in Data Mining.	CO5	L6	6M
	b	Describe the working of PAM algorithm.	CO5	L2	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Regular & 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 mean by software crisis? Identify the reasons for software crisis.	CO1	L2	6M
	b	Compare iterative enhancement model and evolutionary process model.	CO1	L4	6M

OR

2	a	Define data structure metrics. How can we calculate amount of data in a program?	CO1	L3	6M
	b	Explain the spiral model of software development. What are the limitations of such model.	CO1	L4	6M

UNIT-II

3		Discuss various types of COCOMO modes.	CO2	L2	12M

OR

4	a	A project size of 300 KLOC is to be developed. Software development team has average experience on similar type of projects. The project schedule is not very tight. Calculate the effort, development time, average staff size and productivity of the project.	CO2	L4	6M
	b	Explain the Putnam resource allocation model. What are the limitations of this model?	CO2	L3	6M

UNIT-III

5	a	Illustrate software design framework.	CO3	L4	6M
	b	Define cohesion and coupling. Explain relationship between cohesion and coupling.	CO3	L2	6M

OR

6	a	What is design? Describe the difference between conceptual design and technical design.	CO3	L3	6M
	b	What is modularity? List the important properties of a modular system.	CO3	L4	6M

UNIT-IV

7		What is software testing? What is the deference between verification and validation.	CO4	L3	12M

OR

8	a	Explain decision table based testing technique.	CO4	L4	6M
	b	Differentiate between integration testing and system testing.	CO4	L3	6M

UNIT-V

9	a	Explain the phases of software maintenance with help of a diagram.	CO5	L2	6M
	b	What is software maintenance? Describe various categories of maintenance. Which category consumes maximum effort and why.	CO5	L3	6M

OR

10	a	Discuss Reverse engineering and Re-engineering.	CO5	L2	6M
	b	What is regression testing? Differentiate between regression and development testing.	CO5	L3	6M

*** END ***

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

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

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

UNIT-I

1	Define software and Describe the characteristics of software.	CO1	L2	12M

OR

2	What is Agile Process? Write a note on Extreme Programming(XP).	CO1	L3	12M

UNIT-II

3	Illustrate Eliciting Requirements in software requirements gathering.	CO2	L2	12M

OR

4	Examine Scenario-Based Modeling with suitable examples.	CO2	L4	12M

UNIT-III

5	Describe architectural genres for software-based systems.	CO3	L2	12M

OR

6	What is software architecture ? Describe in detail different types of software architectural styles with illustrations.	CO3	L2	12M

UNIT-IV

7	Elaborate golden rules to form the basis for a set of user interface design principles.	CO4	L6	12M

OR

8	Describe Architecture Design in detail.	CO4	L2	12M

UNIT-V

9	What is Testing? Explain a number of software testing strategies with neat sketch.	CO5	L2	12M

OR

10	a	Explain in detail about Black box testing.	CO5	L5	6M
	b	Illustrate Testing Strategies for Object Oriented software.	CO5	L2	6M

*** END ***

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

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a	Explain the working principle of single stage single acting reciprocating air compressor.	CO1	L2	6M
	b	Mention single stage compressor equation for work, if neglecting clearance volume.	CO1	L2	6M

OR

2	a	Explain the working of Centrifugal compressors with neat sketch.	CO1	L2	6M
	b	State how the air compressors are classified.	CO1	L1	6M

UNIT-II

3	a	What are essential components of a simple open cycle gas turbine Plant?	CO2	L1	6M
	b	Write short note on fuels used for gas turbine.	CO2	L2	6M

OR

4		The air enters the compressor of an open cycle constant pressure gas turbine at a pressure of 1 bar and temperature of 20° C. The pressure of the air after compression is 4 bar. The isentropic efficiencies of compressor and turbine are 80% and 85% respectively. The air-fuel ratio used is 90:1. If flow rate of air is 3 kg/s. find,(i) Power developed,(ii) Thermal efficiency of the cycle.	CO2	L3	12M

UNIT-III

5	a	The dry sat steam at a pressure of 5 bar is expanded isentropically in nozzle to a pressure of 0.2 bar. Find the velocity of steam during the nozzle.	CO3	L3	6M
	b	Explain what is meant by critical pressure ratio of a nozzle.	CO3	L2	6M

OR

6	a	What are types of condensers used in steam power plant?	CO3	L1	6M
	b	Explain briefly mixing and non-mixing condensers.	CO3	L2	6M

UNIT-IV

7	a	Explain the working process of reaction turbine.	CO4	L2	6M
	b	Show the velocity triangle diagram of reaction turbine.	CO4	L3	6M

OR

8		In one stage of a reaction steam turbine, both the fixed and moving blades have inlet and outlet blade tip angles of 35^0 and 20^0 respectively. The mean blade speed is 80 m/s and the steam consumption is 22500 kg per hour. Determine the power developed In the pair, if the isentropic heat drop for the pair is 23.5 KJ per kg.	CO4	L3	12M

UNIT-V

9	a	What are the important basic components of an IC engines?	CO5	L1	6M
	b	With a neat sketch explain any three parts in Internal Combustion Engine.	CO5	L2	6M

OR

10		A single cylinder, four stroke cycle oil engine is fitted with a rope brake. The diameter of the brake wheel is 600 mm and the rope diameter is 26 mm. The dead load on the brake is 200 N and the spring balance reads 30 N. If the engine runs at 450 rpm, Discover the brake power of the engine?	CO5	L3	12M

*** END ***

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

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

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

UNIT-I

1	a	Explain the "Indicating instruments", "Recording instruments" and Integrating Instruments". Give examples of each case.	CO1	L2	6M
	b	List the advantages and dis advantages of PMMC type instruments.	CO1	L2	6M

OR

2		What are the different types of damping systems? Explain them with neat diagram.	CO1	L2	12M

UNIT-II

3		Explain how Wien's bridge can be used for experimental determination of frequency. Derive the expression for frequency in terms of bridge parameters.	CO2	L4	12M

OR

4		Explain how insulation resistance of a cable can be measured with a help of Loss of charge method.	CO2	L2	12M

UNIT-III

5	a	Derive the torque equation for electro dynamo meter type wattmeter.	CO3	L4	6M
	b	A single phase kilo watt hour meter makes 500 revolutions per kilo watt hour. It is found on testing as making 40 revolutions in 58.1 seconds at 5KW full load. Find the percentage error.	CO3	L3	6M

OR

6		Explain with a neat sketch the construction and working of a single-phase Dynamometer type Wattmeter.	CO3	L2	12M

UNIT-IV

7		Explain the construction of (i) Current transformer (ii) Potential transformer.	CO4	L2	12M

OR

8	a	Describe the construction and working of LVDT with a neat schematic	CO4	L2	6M
	b	Describe the working principle of thermocouples.	CO4	L2	6M

UNIT-V

9	a	Explain the construction and working principle of Flux meter with a neat diagram.	CO5	L2	6M
	b	compare flux meter and Ballistic Galvanometer.	CO5	L2	6M

OR

10		Explain the internal structure of CRT with a neat diagram.	CO5	L2	12M

*** END ***

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

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

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

UNIT-I

1	a	Mention the applications of IoT	CO1	L1	4M
	b	Explain various link layer protocols of IoT.	CO1	L1	8M

OR

2	a	Describe various functional blocks of IoT.	CO1	L2	6M
	b	Write down the differences between Rest API & Web Socket API.	CO1	L2	6M

UNIT-II

3	Explain the implementation of IoT technology in following areas: (i) Smart Parking (ii)Smart Lightening (iii) Emergency response (iv) smart roads in smart cities	CO2	L5	12M

OR

4	Explain how IoT technology used to enable the agricultural industry to increase operational efficiency, lower costs, reduce waste, and improve the quality of their yield.	CO2	L3	12M

UNIT-III

5	a	Mention the communication protocols used for M2M local area networks.	CO3	L2	6M
	b	Explain the differences between Machines in M2M and Things in IOT.	CO3	L5	6M

OR

6	a	Mention advantages and Disadvantages of M2M communication system.	CO3	L1	6M
	b	What are the characteristics of M2M network?	CO3	L1	6M

UNIT-IV

7	a	Mention the flavors of Linux OS supported by Raspberry pi device	CO4	L2	6M
	b	List the various frequently used commands during operation of Linux OS.	CO4	L1	6M

OR

8	Design an automatic refrigerator light system with LED, switch & raspberry pi and write a python program to support the working of that design.	CO4	L6	12M

UNIT-V

9	a	Explain functional and operational view specifications for Home Intrusion detection system?	CO5	L5	6M
	b	Write a python program for room and door REST services using serializes.	CO5	L3	6M

OR

10	a	Implementation of smart irrigation system.	CO5	L6	6M
	b	Design a smart lighting system using IoT device.	CO3	L6	6M

*** END ***

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	Write in detail about the Structure of Compiler?	CO1	L3	6M
	b	Analyzethe need for separating lexical analysis and syntax analysis	CO1	L4	6M

OR

2	a	Illustrate Application of compiler technology	CO1	L3	4M
	b	Explain LEX Tool with the structure of Lex Program?	CO1	L2	8M

UNIT-II

3		Consider the grammar E☐TE1	CO2	L3	12M

$E1\rightarrow +TE1 | -TE1 | \varepsilon$
$T\rightarrow FT1$
$T1\rightarrow *FT1 | / FT1 | \varepsilon$
$F\rightarrow (E)/ id$
Calculate FIRST and FOLLOW for the above grammar
Construct the predictive parse table and check whether the given
grammar is LL(1) ornot.

OR

4	a	Illustratethe rules to be followed in the finding the FIRST and FOLLOW.	CO2	L2	6M
	b	Calculate FIRST and FOLLOW for the following grammar? $E\rightarrow E+T/T$ $T\rightarrow T*F/F$ $F\rightarrow (E)/id$	CO2	L3	6M

UNIT-III

5	a	Explain in detail about YACC tool?	CO3	L2	6M
	b	Describe Synthesized and Inherited attributes with examples.	CO3	L2	6M

OR

6	a	Define a syntax-directed translation.	CO3	L1	6M
	b	Summarise the evaluation order of SDT with an example	CO3	L5	6M

UNIT-IV

7		Summarise heap management mechanism.	CO4	L5	12M

OR

8	a	Write properties of memory management	CO4	L3	4M
	b	Discuss Storage allocation strategies with suitable examples?	CO4	L2	8M

UNIT-V

9	a	List and explain the Issues in the design of a code generator.	CO5	L1	6M
	b	Define and Show Dead-code elimination with example.	CO5	L3	6M

OR

10	a	Describe about global data flow analysis?	CO5	L2	6M
	b	Discuss function preserving transformations?	CO5	L2	6M

*** END ***

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

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

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

UNIT-I

1		Develop the expression for Electric and Magnetic Field radiated by Half Wave Dipole Antenna and Sketch its Field Strength pattern.	CO1	L3	12M

OR

2	a	Calculate radiation resistance of a dipole antenna of length $\lambda/8$ m.	CO1	L3	6M
	b	Define Effective Aperture and give its expression.	CO1	L3	6M

UNIT-II

3	a	Explain about construction and operation of Yagi-Uda antenna with neat sketch.	CO4	L2	6M
	b	Explain about the construction and operation of helical antenna.	CO4	L2	6M

OR

4	a	Calculate the directivity of 20 turn helix with $\alpha = 12°$ and circumference equals to one wavelength.	CO4	L3	6M
	b	Give the applications of helical antennas	CO4	L1	6M

UNIT-III

5	a	Explain the effect between variation of focal length position and radiation in paraboloid.	CO3	L2	6M
	b	Explain Cassegrain Feed system and give its advantages.	CO3	L2	6M

OR

6	a	Draw and explain the principle of parabolic reflector.	CO3	L2	6M
	b	A parabolic dish provides a power gain of 50 dB at 10 GHz with 70% efficiency. Find out i)HPBW ii) BWFN iii) Diameter.	CO3	L2	6M

UNIT-IV

7		Compare the Broad side array and end fire array.	CO4	L5	12M

OR

8	a	Show that Directivity of BSA, L>>d is $D_0=2(d/\lambda)$.	CO4	L5	6M
	b	Write short notes on collinear Array	CO4	L5	6M

UNIT-V

9	a	Explain the relation between MUF and skip distance.	CO6	L5	6M
	b	Explain Multi hop propagation.	CO6	L5	6M

OR

10	a	Explain optimum working frequency and its significance.	CO5	L5	6M
	b	Explain lowest usable high frequency (LUHF) and give its significance.	CO6	L5	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Supplementary Examinations October/November-2025
CONTROL SYSTEMS
(Electrical & Electronics Engineering)
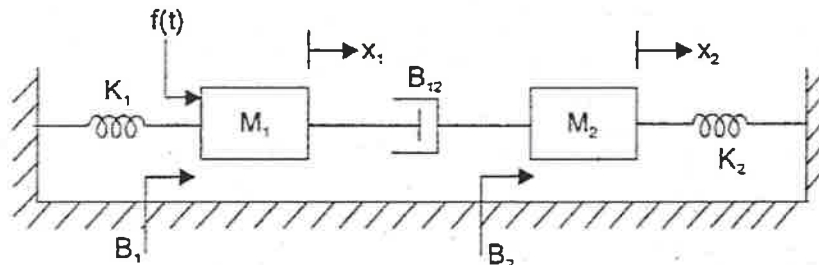
Time: 3 Hours　　　　　　　　　　　　　　　　　　　　　**Max. Marks: 60**

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

UNIT-I

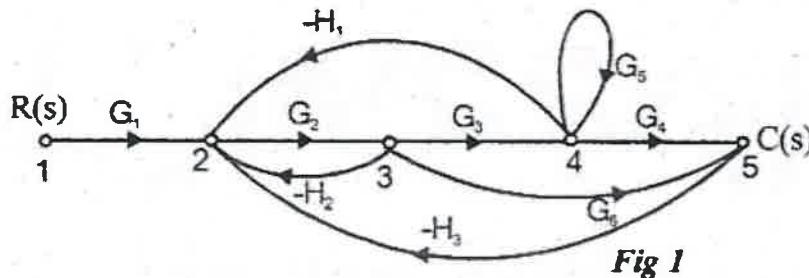**1**　Determine the transfer function, $\dfrac{X_1(s)}{F(s)}$ and $\dfrac{X_2(s)}{F(s)}$ for the system shown in fig　　**CO1 L1 12M**

OR

2　Obtain the overall gain C(S)/R(S) from signal flow graph shown in fig.　　**CO1 L1 12M**

Fig 1

UNIT-II

3　List out the time domain specifications and derive the expressions for Rise time, Peak time and Peak overshoot.　　**CO2 L2 12M**

OR

4　Define steady state error? Derive the static error components for Type 0, Type 1 &Type 2 systems?　　**CO2 L3 12M**

UNIT-III

5　With the help of Routh's stability criterion determine the stability of the following systems represented by the characteristic equations:　　**CO3 L3 12M**
　a) $S^5+S^4+2S^3+2S^2+3S+5 = 0$　　b) $9S^5+20S^4+10S^3-S^2-9s-10 = 0$

OR

6　Develop the root locus of the system whose open loop transfer function is　　**CO3 L4 12M**

$$G(S)H(S) = \frac{K}{S(S^2 + 6S + 10)}$$

UNIT-IV

7　Sketch the polar plot for the open loop transfer function of a unity feedback system is given　　**CO4 L4 12M**

by $G(s) = \dfrac{1}{S(1 + S)(1 + 2S)}$. Determine Gain Margin & Phase Margin.

OR

8		Obtain the transfer function of lead compensator, draw pole-zero and write the procedure for design of leadcompensator using Bode plot.	CO4	L3	12M

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

OR

10	a	Define state, state variable, state equation.	CO5	L2	6M
	b	Derive the expression for the transfer function from the state model. $X = Ax + Bu$ and $y = Cx + Du$	CO5	L2	6M

*** END ***

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

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

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

UNIT-I

1	Draw the block diagram of thermal power station (TPS) showing paths of coal, steam, water, air, ash and flue gases and explain principle of operation briefly.	CO1	L1	12M

OR

2	a	Explain the function of chimney and precipitator.	CO1	L2	6M
	b	What factors are taken into account while selecting the site of hydro electric power plant?	CO2	L1	6M

UNIT-II

3	Draw the schematic diagram of a nuclear power station and discuss its operation.	CO2	L1	12M

OR

4	a	Explain about the fast breeder reactor.	CO2	L2	6M
	b	What are the factors considered while selecting the site for nuclear power plant?	CO2	L1	6M

UNIT-III

5	a	What is Skin effect? Explain.	CO3	L1	6M
	b	Determine the inductance/phase/km of a double circuit 3-phase line. The radius of each conductor is 20mm and the conductors are placed on the circumference of an imaginary circle at a distance of 7m forming a regular hexagonal figure.	CO3	L6	6M

OR

6	Write a short note on (i) ACSR conductor (ii) Bundled conductors (iii) Standard conductors	CO3	L1	12M

UNIT-IV

7	A 100km long, 3-phase, 50Hz transmission line has following line constants: Resistance/ph/km=0.1ohm, Reactance/ph/km=0.5ohm, Susceptance/ph/km=$10*10^{-6}$ siemen. If the line supplies load of 20MW at 0.9 p.f lagging at 66KV at the receiving end, calculate (i) Sending end power factor (ii) % regulation (iii)Transmission efficiency. By using nominal Π method.	CO4	L3	12M

OR

8	Derive expression for voltage regulation of medium transmission lines using nominal -π method with equivalent circuit and necessary phasor diagram.	CO4	L2	12M

9	a	Derive the expression for sag and tension when the supports are at unequal heights.	CO6	L2	6M
	b	An overhead transmission line at a river crossing is supported from two towers at heights of 40m and 90 m above water level. The horizontal distance between the towers being 400m. If the allowable tension is 2000 kg, find the clearance between the conductor and water at a point mid-way between the towers. Weight of conductor is 1kg/m	CO6	L3	6M

OR

10	a	What do you understand by grading of insulators? Explain.	CO5	L1	6M
	b	Each line of a three phase system is suspended by a string of three identical insulators of self capacitance of C farad. The shunt capacitance of connecting metal work of each insulator is 0.2C to earth and 0.1C to line. Calculate the string efficiency of the system and also calculate string efficiency if a guard –ring increases the capacitance to the line of metal work of the lowest insulator to 0.3C	CO5	L5	6M

*** END ***