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

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

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

UNIT-I

1	a	What are the merits, demerits and limitations of Finite Element Methods?	CO1	L1	6M
	b	Explain in detail finite element method procedure with an example.	CO1	L2	6M

OR

|				
2	Using Rayleigh – Ritz method determine the expression for maximum displacement, when The cantilever beam subjected to point W,KN at the free end. Also, compare it with the standard expression.	CO2	L3	12M

UNIT-II

3	Derive Stiffness matrix for 1D – two noded linear bar element.	CO3	L2	12M

OR

4	Determine the nodal displacements at node 2, stresses in each material and element stiffness matrix for each element as shown in Fig., due to applied force.	CO3	L3	12M

$P = 400 \times 10^3 N$.
$A_1 = 2400 \text{ mm}^2$ & $A_2 = 1200 \text{ mm}^2$ $L_1 = 300 \text{ mm}$ & $L_2 = 400 \text{ mm}$ $E_1 = 0.7 \times 10^5 \text{ N/mm}^2$ & $E_2 = 2 \times 10^5 \text{ N/mm}^2$
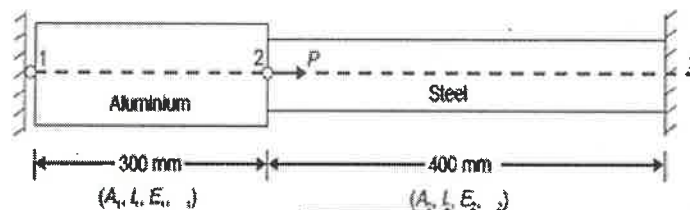
UNIT-III

5	Derive shape functions for four noded rectangular elements. Use natural coordinate system.	CO4	L3	12M

OR

6	Derive the strain-displacement matrix for CST element.	CO4	L1	12M

UNIT-IV

7	Explain the isoparametric concept in finite element analysis.	CO6	L1	12M

OR

8	Derive the shape function for 4-Noded isoparametric quadrilateral element.	CO6	L2	12M

UNIT-V

9	What are the three dimensional stresses and strains explain the relation between them.	CO7	L1	12M

OR

10	Explain about Hexahedral Isoparametric elements.	CO7	L2	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
DESIGN OF ADVANCED CONCRETE STRUCTURES
(Structural Engineering)

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

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

UNIT-I

1	a	How to do the Estimation of Crack width in Beams by IS456?	CO1	L2	6M
	b	Explain the Factors affecting Crack width in beams with neat sketch.	CO1	L1	6M

OR

2		A beam AB of 4 m span and fixed at the ends, carries an UDL of 30 KN/m at collapse. Draw maximum bending moment diagram as per IS code recommendations for redistribution of moments.	CO1	L3	12M

UNIT-II

3	A Simply supported beam of 250 mm wide and 1500 mm overall depth & 2300 mm clear span is simply supported on 200 mm wide support on either side it carries UDL of 200KN/m inclusive of its self weight. Design the beam using M20 concrete and Fe415 Grade.	CO2	L3	12M

OR

4	Explain the procedure for continuous deep beam and draw the reinforcement details.	CO2	L2	12M

UNIT-III

5	Design a continuous ribbed slab with 3 equal spans of 5.8 m. the ribs supports on the beam with over span is 250 mm x 600 mm. take live load on the slabs is 3 KN/m^2 use M20 Grade concrete and Fe415 steel.	CO3	L4	12M

OR

6	Write in detail about ultimate moment of resistance and design of slab in ribbed slab with neat sketch.	CO3	L1	12M

UNIT-IV

7	Estimate the dimensions of the flat slab systems(with drops) for a four storey building with 5 span of 7.5m in the longer directions, 5 span of 6m in the shorter directions, and a storey height of 3m.	CO4	L3	12M

OR

8	a	Write in detail about grid floor slab? With functions, characteristics and failure of grid slab?	CO4	L1	6M
	b	Write the operational design procedure of the grid floor slab.	CO4	L1	6M

UNIT-V

9	A plain brace concrete wall of dimensions 8m x 5m long and 200mm thick is restrained against rotations at its base and restrained at the base. It has to carry a factored total gravity load of 180kN and factored horizontal load of 8.45kN at the top. Check the safety of the wall. Assume fck = 20N/mm^2 , fy = 415 N/mm^2 .	CO5	L3	12M

OR

10	Write in detail about general dimensions of rectangular shear walls, vertical and horizontal reinforcements, strength Requirements shear wall	CO5	L1	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & SupplementaryExaminations August-2024
MACHINE LEARNING
(Computer Science & Engineering)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a	Explain in detail distance based methods.	CO1	L4	6M
	b	What is a decision tree? Explain in detail.	CO1	L2	6M

OR

2	Discuss the nearest neighbor with a neat sketch.	CO1	L3	12M

UNIT-II

3	a	How Matrix factorization works in PCA. Explain in detail?	CO2	L3	6M
	b	Explain PCA and its process with their applications	CO2	L2	6M

OR

4	Discuss PCA and its kernel PCA.	CO2	L4	12M

UNIT-III

5	a	Explain the evaluation technology of machine learning algorithm.	CO3	L3	6M
	b	Define Model Selection & Discuss in detail.	CO3	L2	6M

OR

6	Explain the concept of Bagging with its uses.	CO3	L2	12M

UNIT-IV

7	a	What is Sparse Modelling? Explain its functions.	CO4	L4	6M
	b	What is deep learning? Discuss its importance.	CO4	L3	6M

OR

8	Illustrate the following concept of Semi supervised learning.	CO4	L2	12M

UNIT-V

9	a	Examine in detail various learning techniques.	CO5	L4	6M
	b	Explain IOT and its features with any one application.	CO5	L2	6M

OR

10	Compile the recent trends in various learning techniques of machine learning.	CO5	L3	12M

*** END ***

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

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a	Write short note on the Fuzzy Set theory.	CO1	L1	6M
	b	Describe evolutionary computation in soft computing.	CO1	L2	6M

OR

2	Differentiate supervised learning and unsupervised learning.	CO1	L2	12M

UNIT-II

3	Explain the relations of classical sets and fuzzy sets	CO3	L2	12M

OR

4	Interpret the Mamdani Fuzzy models with examples.	CO3	L4	12M

UNIT-III

5	Describe the Back Propagation Neural network with neat sketch.	CO2	L1	12M

OR

6	Explain the concept of associative memory in ANN.	CO2	L2	12M

UNIT-IV

7	a	Differentiate genetic algorithm versus traditional algorithm.	CO4	L2	6M
	b	Describe the applications of genetic algorithm.	CO4	L1	6M

OR

8	Explain the basic terminologies in Genetic Algorithm and how the chromosome is correlated with GA?	CO4	L2	12M

UNIT-V

9	Explain the basic features of MATLAB in detail.	CO5	L2	12M

OR

10	How the arrays and Array operators are implemented using Matlib/python lib?	CO5	L1	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular& SupplementaryExaminations August-2024
CYBER SECURITY
(Computer Science & Engineering)

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

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

UNIT-I

1		Discuss and Elaborate about Cybercrime and its related security measures.	CO1	L2	12M
		OR			
2	a	Define cybercrime and information security.	CO1	L1	6M
	b	Who are cybercriminals? How they are harmful to society?	CO1	L2	6M

UNIT-II

3	a	Discuss the various tools used in cybercrime.	CO2	L2	6M
	b	Classify different techniques used in cybercrime.	CO1	L4	6M
		OR			
4	a	Justify various tools and techniques used to launch attacks against the target.	CO2	L3	6M
	b	How hacker use the SQL injections to hack the information. Summarize it.	CO2	L2	6M

UNIT-III

5		Explain the steps in Cyber Forensic analysis of e-mail in detail.	CO3	L3	12M
		OR			
6		Explain in details about Network forensics and its types.	CO3	L2	6M

UNIT-IV

7	a	Compare Mobile Computing Vs Wireless Computing .	CO5	L2	6M
	b	Distinguish Malwares, viruses and worms .	CO5	L4	6M
		OR			
8	a	Summarize the Proliferation (Growth) of Mobile and Wireless Devices .	CO5	L2	6M
	b	Express the importance of security policies related to Hand held devices	CO5	L3	6M

UNIT-V

9		Explain in detail about organizational implications.	CO6	L2	12M
		OR			
10	a	What are the types of cookies? Explain in detail .	CO6	L1	6M
	b	Discuss how to protect online protection.	CO6	L2	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
HUMAN COMPUTER INTERACTION
(Computer Science and Engineering)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a	Explain the advantages of graphical systems.	CO1	L1	6M
	b	List out the characteristics of a web interface.	CO1	L2	6M

OR

2	a	Explain the Principles of user interface design.	CO1	L2	6M
	b	Write a short note on the usability assessment in the design process.	CO1	L1	6M

UNIT-II

3	a	Discuss about human interaction speeds.	CO2	L1	6M
	b	What is meant by basic business function? Explain with example.	CO2	L1	6M

OR

4	Briefly explain about visually pleasing composition concept in screen design.	CO2	L2	12M

UNIT-III

5	a	What are Window characteristics?	CO3	L1	6M
	b	How to format on Menus? Explain.	CO3	L1	6M

OR

6	a	Discuss about components of Multimedia.	CO3	L2	6M
	b	Explain about the text for Web pages.	CO3	L2	6M

UNIT-IV

7	Explain in detail about Platforms in Mobile Ecosystem with suitable examples?	CO4	L2	12M

OR

8	List in detail about Types of Mobile Applications with suitable examples.	CO4	L1	12M

UNIT-V

9	a	How to select the device based controls. Explain in detail.	CO5	L1	6M
	b	What are Operable controls? Give example.	CO5	L1	6M

OR

10	What are the selection controls? Explain in detail.	CO5	L1	12M

*** END ***

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

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

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

UNIT-I

1		Derive general heat conduction equation in Cartesian co-ordinates	CO1	L6	12M

OR

2	a	Explain the different modes of heat transfer with appropriate expressions.	CO1	L1	6M
	b	What are Biot and Fourier numbers? Explain their physical significance?	CO1	L1	6M

UNIT-II

3	a	What is convective heat transfer? Distinguish between free and forced convection.	CO2	L1	6M
	b	Derive the expression for Reynolds number and how flows are determined by Reynolds number.	CO2	L6	6M

OR

4		Derive expressions for boundary layer thickness and local skin friction coefficient following the Blasius method of solving laminar boundary layer equations for flat plate.	CO2	L6	12M

UNIT-III

5	a	What are the unique features of boiling and condensation?	CO3	L1	6M
	b	What are the applications of boiling and condensation process?	CO3	L1	6M

OR

6		Explain in detail about boiling regimes with a neat sketch.	CO3	L2	12M

UNIT-IV

7	a	Distinguish between regenerator and recuperator.	CO4	L4	6M
	b	What is meant by LMTD? Write the assumptions to derive LMTD expression.	CO4	L1	6M

OR

8		Develop an expression for LMTD in the case of counter- flow heat exchanger.	CO4	L6	12M

UNIT-V

9	a	State and explain Kirchhoff's identity. What are the conditions under which it is applicable.	CO5	L2	6M
	b	Distinguish between a black body and grey body.	CO5	L4	6M

OR

10		A thin aluminum sheet with an emissivity of 0.1 on both sides is placed between two very large parallel plates that are maintained at uniform temperatures T_1 = 800 K and T_2 = 500 K and have emissivity 0.2 and 0.7 respectively. Determine the net rate of radiation heat transfer between the two plates per unit surface area of the plates and compare the result to that without shield.	CO5	L5	12M

*** END ***

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

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

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

UNIT-I

1		A Vessel of Volume 0.04 m³ contains a mixture of Saturated Water and Saturated Steam at Temperature 250°C. The mass of Liquid Pressure is 9 Kg. Find the Pressure, Mass, Specific Volume, Enthalpy, Entropy and Internal Energy.	CO1	L4	12M

OR

2	a	Differentiate between Fire tube boiler and Water Tube Boiler.	CO1	L4	6M
	b	Elucidate the working of Babcock and Wilcock Boiler with a neat sketch.	CO1	L2	6M

UNIT-II

3	a	What are basic requirements of piping system in Boilers?	CO5	L1	6M
	b	Name the materials used in the Piping system of Boilers along with its functions.	CO1	L1	6M

OR

4		Derive an expression for the economic thickness of Insulation.	CO2	L4	12M

UNIT-III

5		Draw the line diagram of steam generating facility and explain all the components.	CO3	L2	12M

OR

6	a	Justify that Steam traps increase the efficiency of the distribution system.	CO6	L5	6M
	b	Illustrate the working of Inverted bucket steam trap with a neat sketch.	CO6	L2	6M

UNIT-IV

7		Discuss in detail about the Performance test codes of boilers.	CO5	L2	12M

OR

8		In detail discuss about the various losses associated with the operation of Boiler	CO5	L2	12M

UNIT-V

9	a	How can you conserve the energy in Boilers?	CO5	L1	6M
	b	Write a short note on Waste Minimization	CO3	L2	6M

OR

10		Explain various Process Control Loops in Boilers.	CO6	L2	12M

*** END ***

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

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1		Explain the working of saturated Vapour compression refrigeration system and derive the cycle efficiency.	CO1	L2	12M

OR

2	a	A Carnot refrigerator using R12 as working fluid operates between 40°C and -30°C.e Determine the work of compression and cooling effect produced by the cycle.	CO1	L3	6M
	b	Discuss the effects of evaporator and condenser temperatures on Carnot COP.	CO1	L2	6M

UNIT-II

3	a	Classify the compressors used in refrigeration systems.	CO2	L3	6M
	b	Explain briefly the working of reciprocating compressors.	CO2	L2	6M

OR

4	a	What are various methods available for controlling the capacity of compressors?	CO2	L1	4M
	b	With a neat sketch, explain the hot gas by-pass system followed for controlling the capacity of compressor	CO2	L2	8M

UNIT-III

5		With a neat sketch, explain the function of evaporative condenser.	CO3	L2	12M

OR

6	a	Classify the evaporators used in refrigeration	CO4	L2	6M
	b	Discuss the complexities that may arise in the design of evaporator	CO4	L3	6M

UNIT-IV

7	a	What is the need of low temperature insulations? Discuss	CO5	L1	6M
	b	Write short notes on Vacuum Insulation	CO5	L3	6M

OR

8		Discuss the process of Gas separation system.	CO5	L6	12M

UNIT-V

9	a	What is the principle of liquification? Explain.	CO6	L1	6M
	b	Briefly describe the process of gas liquification.	CO6	L2	6M

OR

10		Explain the Linde system used for air liquification.	CO6	L2	12M

*** END ***

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

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Explain the Reliability of instruments.	CO1	L5	12M

OR

2	Describe the role of static and dynamic error analysis in achieving precise experimental results.	CO1	L2	12M

UNIT-II

3	What is data acquisition? Explain in detail.	CO2	L1	12M

OR

4	Explain experimental planning and selection of measuring instruments with the help of neat sketches.	CO2	L5	12M

UNIT-III

5	Explain with neat sketch of instruments used to measure flow of gas.	CO3	L2	12M

OR

6	What is meant thermo physical properties? and Define the procedure and components used to measure it.	CO3	L1	12M

UNIT-IV

7	What is mean by telemetry in measurements? Explain in detail	CO4	L1	12M

OR

8	Explain in detail with neat sketch about optical gas analyzer.	CO4	L5	12M

UNIT-V

9	Describe the procedure to measure dust particles and moisture.	CO5	L2	12M

OR

10	Explain in detail with neat sketch about optical gas analyzer.	CO5	L5	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & SupplementaryExaminations August-2024
POWER ELECTRONIC CONVERTERS
(Power Electronics)

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

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

UNIT-I

1	a	Explain about steady state characteristics of BJT with neat sketch.	CO1	L3	6M
	b	What is the switching model of n-channel MOSFET?	CO1	L2	6M

OR

2	What are the output and transfer characteristics of IGBTs.	CO1	L3	12M

UNIT-II

3	a	What is the pulse-width-modulation control of converters?	CO2	L2	6M
	b	The single phase full converter has a RL load having L=6.5mh, R=0.5 ohm, and E=10V the input voltage Vs=120V at (rms) 60hz. Determine i) the load current IL_0 at wt= $\alpha=60^0$ ii) the average thyristor current, iii) the rms thyristor current iv) rms output current v) the critical delay angle.	CO2	L4	6M

OR

4	Explain the principle of operation of three-phase half-wave converters.	CO2	L3	12M

UNIT-III

5	Classify the converters based on quadrant operation and explain in detail with neat diagrams.	CO3	L2	12M

OR

6	Explain the principle of step-down converter with RL-load.	CO3	L3	12M

UNIT-IV

7	Explain the principle of the Three-Phase bridge Inverter with neat circuit diagram and waveforms.	CO4	L3	12M

OR

8	Draw the waveforms for three-phase inverter when each transistor conducts for120°.	CO4	L3	12M

UNIT-V

9	a	What are the types of inverters? explain in detail.	CO5	L2	6M
	b	What is the difference between single-Phase and Three-Phase inverters?	CO5	L3	6M

OR

10	Explain the operation of single-phase inverter and draw the waveforms.	CO5	L3	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
DIGITAL CONTROL OF POWER ELECTRONICS AND DRIVES SYSTEMS
(Power Electronics)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Derive the steady state performance equations and Explain Torque – Speed characteristics of IM Drive?	CO1	L1	12M

OR

2	a	Find the efficiency of an induction motor operating at full load. The machine details are given in the following,2000 hp, 2300V, 3 phase, star connected, 4 pole, 60Hz, Full load slip = 0.03746, $R_s = 0.02\Omega$; $R_r = 0.12\Omega$; $R_c = 451.2\Omega$; $X_m = 50\ \Omega$; $X_{ls} = X_{lr} = 0.32\ \Omega$.	CO1	L3	6M
	b	The line power factor needs to be improved to unity by installing capacitors at the input terminals of the induction motor. Calculate the per-phase capacitance required to obtain a line power factor of unity.	CO1	L3	6M

UNIT-II

3	Find the relation between the dc link voltage and the stator frequency for the closed loop implementation of a volts/Hz inverter-fed induction motor drive. The motor parameters are as follows: 5 HP, 200 V, 60 Hz, 9 phase, star connected 4 pole, 0.86 pf and 0.82 efficiency. $R_S = 0.277\ \Omega$, $R_r = 0.183\ \Omega$, $X_m = 20.30\ \Omega$, $X_{ls} = 0.554\ \Omega$, $X_{lr} = 0.841\ \Omega$	CO2	L3	12M

OR

4	Explain how speed and flux controlled in CSI fed IM Drive operating under V/f control?	CO3	L2	12M

UNIT-III

5	Describe a static Kramer drive and show that the slip s at which it operates is given by $S = -(a_T/a)\cos\alpha$.	CO3	L2	12M

OR

6	Explain with relevant circuit diagram for different modes the operation of static scherbius drive.	CO3	L2	12M

UNIT-IV

7	Explain the brush and brushless DC excitation of the wound-field synchronous motor.	CO4	L2	12M

OR

8	Derive the expression for maximum torque/ampere control for SRM drive.	CO4	L3	12M

UNIT-V

9	Derive the voltage and current modelling equations of PM Brushless DC Motor.	CO5	L3	12M

OR

10	Explain Flux weakening operation of permanent magnet synchronous motor.	CO5	L2	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
SWITCHED MODE AND RESONANT CONVERTERS
(Power Electronics)

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

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

UNIT-I

1		Explain the modes of operation in boost switching regulator.	CO1	L1	12M
		OR			
2		Describe push-pull and forward converter topologies.	CO1	L2	12M

UNIT-II

3	a	Explain the Full-bridge magnetics.	CO2	L5	6M
	b	Describe the half-bridge converter topology.	CO2	L2	6M
		OR			
4		Explain the flux-imbalance problem in bridge transformer.	CO2	L1	12M

UNIT-III

5	a	Illustrate the High frequency link integral half cycle converter.	CO3	L2	6M
	b	Describe the fly back converter- mode of operation.	CO3	L2	6M
		OR			
6		Describe the zero voltage switching clamped voltage topologies.	CO3	L2	12M

UNIT-IV

7	a	Summarize the advantages of current mode control.	CO4	L4	6M
	b	Compare current mode and voltage mode control methods.	CO4	L5	6M
		OR			
8		Explain Slope Compensation to Correct Problems in Current Mode control method.	CO4	L2	12M

UNIT-V

9	a	Explain about bidirectional dc power supplies.	CO5	L5	6M
	b	Write a brief note on Effect of EMI Filter on SMPS Control.	CO5	L3	6M
		OR			
10		Describe about resonant pulse ac power supplies.	CO5	L2	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
SMART GRIDS
(Power Electronics)

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

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

UNIT-I

1	a	Define smart grid concept and explain its necessity.	CO1	L1	6M
	b	Explain how the automatic meter reading can make the system smarter.	CO1	L3	6M

OR

2	a	Explain the concept of robust and self healing grid.	CO3	L2	6M
	b	Explain outage management system.	CO2	L2	6M

UNIT-II

3	a	Explain phase measuring unit.	CO2	L2	6M
	b	Explain IED application for monitoring and protection	CO3	L2	6M

OR

4	a	Compare conventional metering and smart metering.	CO1	L3	6M
	b	Explain smart metering and advantages of it.	CO2	L1	6M

UNIT-III

5	a	Explain the concept of micro grid, and its need and applications.	CO3	L1	6M
	b	Explain the protection and control of micro grid.	CO2	L2	6M

OR

6	a	Describe the power quality issues of grid connected renewable energy sources	CO3	L3	6M
	b	Explain plastic and organic solar cells.	CO3	L2	6M

UNIT-IV

7	a	Explain the concept of power quality in smart grid.	CO4	L3	6M
	b	How the power quality can be improved in smart grid.	CO4	L2	6M

OR

8	a	Draw the flow chart of procedure for monitoring power quality and issues of power quality monitoring	CO4	L3	6M
	b	Explain the importance of power quality in smart grid.	CO4	L1	6M

UNIT-V

9	a	Explain about Wide area network.	CO5	L2	6M
	b	Explain cloud computing and its need.	CO5	L1	6M

OR

10	a	Explain the IP based protocols	CO5	L2	6M
	b	Explain types and applications of ZigBee.	CO5	L1	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
FPGA ARCHITECTURES & APPLICATIONS
(VLSI)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a	Explain the LAB of Altera max 7000 CPLD with a neat structural diagram.	CO1	L3	6M
	b	Discuss about speed performance and in-system programmability of lattice PLST's architecture in 3000 series.	CO1	L2	6M

OR

2	a	Draw the structure of PAL and explain it.	CO1	L4	6M
	b	Explain and draw the architecture of AMD Mach 4 CPLD.	CO1	L2	6M

UNIT-II

3	a	Draw the design flow of field programmable gate arrays.	CO2	L4	6M
	b	Explain the architecture and speed performance of Actel's ACT2 FPGA family.	CO2	L2	6M

OR

4	a	Draw the architecture of Altera flex 10000 FPGAs and Explain it.	CO2	L4	6M
	b	List out the applications of FPGAs.	CO2	L3	6M

UNIT-III

5	a	Explain about state assignments for FPGA.	CO3	L3	6M
	b	Explain the basic concepts of petrinets and state its properities.	CO3	L2	6M

OR

6	a	Explain about realization for state machine charts with a PAL.	CO3	L2	6M
	b	llustrate about metastability characteristics.	CO3	L2	6M

UNIT-IV

7	a	Design of the one to three pulse generator by using PLA.	CO4	L5	6M
	b	Explain about state transition table.	CO4	L2	6M

OR

8	a	Design of a More Complex FSM by using a ROM as the PLD.	CO4	L5	6M
	b	Design a one- hot controller for the ASM.	CO4	L5	6M

UNIT-V

9	Design the CLB combinational circuit by using parallel adder cell.	CO5	L5	12M

OR

10	Design the state machine for decade counter.	CO5	L5	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
LOW POWER VLSI DESIGN
(VLSI)

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

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

UNIT-I

1	a	What are the various limitations of Low-voltage, Low-power design?	CO2	L2	6M
	b	Explain low cost, medium speed digital CMOS process.	CO2	L2	6M

OR

2		Describe different process considerations for Bipolar transistors.	CO2	L1	12M

UNIT-II

3	a	Explain in detail about copper Electroplating/Copper-Fill.	CO1	L1	6M
	b	Explain the low capacitance Bipolar/BiCMOS processes with neat diagram.	CO1	L1	6M

OR

4		Explain the following Advanced MOSFET models, a) HSPICE level 50 Model, b)EKV MOSFET Model.	CO1	L3	12M

UNIT-III

5	a	Design basic NOR and NAND gate using conventional CMOS logic gates.	CO3	L1	6M
	b	Discuss the experimental result of merged BiCMOS digital circuits.	CO3	L1	6M

OR

6		Explain the following parameters in ESD-free BiCMOS Digital circuits, a) Circuit operation. b) Comparative evaluation.	CO1	L2	12M

UNIT-IV

7	a	Explain about the optimization and the performance theme in the evolution of latches and flip.	CO3	L1	6M
	b	Explain about the high performance and low power theme in the evolution of latches and Flip-flop.	CO1	L2	6M

OR

8		Interpret the measurement of power dissipation measure in latches and Flip flops.	CO1	L2	12M

UNIT-V

9	a	Explain about Frequency Division and Multiplication.	CO1	L2	6M
	b	Interpret Low Swing Bus with suitable diagram.	CO1	L2	6M

OR

10		Discuss how delay can be balanced in low power bus.	CO2	L1	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
ALGORITHMS FOR VLSI DESIGN AUTOMATION
(VLSI)

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

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

UNIT-I

1	a	What are the most important entities in VLSI design and explain in detail?	CO1	L2	5M
	b	Draw the decomposition tree and explain.	CO1	L3	7M

OR

2		What are the several purpose methods for combinational optimization? Explain briefly.	CO1	L1	12M

UNIT-II

3	a	With an example, explain the difference between modeling and simulation.	CO3	L1	6M
	b	Explain Gate level and switch level modeling.	CO3	L2	6M

OR

4		What is meant by modeling and simulation? Differentiate gate level and switch level modeling and simulation procedures with suitable example.	CO2	L2	12M

UNIT-III

5	a	Draw Binary-Decision diagrams for an Inverter.	CO3	L3	6M
	b	Write short notes of logic synthesis.	CO3	L2	6M

OR

6		Explain Heuristic based on ROBDD.	CO3	L2	12M

UNIT-IV

7	a	List & explain any two scheduling algorithms.	CO4	L3	6M
	b	Describe High-level Transformation.	CO4	L1	6M

OR

8	a	What type of Hardware components can be used by a high- level synthesis system?	CO4	L2	6M
	b	Explain how the ASAP scheduling algorithm is used to find the longest path?	CO4	L1	6M

UNIT-V

9	a	Explain the physical design cycle of FPGA.	CO5	L1	6M
	b	How partitioning is performed for staggered model.	CO5	L3	6M

OR

10	a	Briefly explain MCM technologies.	CO6	L2	6M
	b	What are the different methods of MCM routing? Explain.	CO6	L2	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
REAL TIME OPERATING SYSTEM
(VLSI)

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

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

UNIT-I

1	a	Name the features Real time operating system.	CO1	L1	5M
	b	Define an operating system? Specify the comparisons between General and Real time systems	CO1	L1	7M

OR

2	a	What is the need for real time system? Explain with examples.	CO1	L2	6M
	b	What are the specific requirements in real time system?	CO1	L2	6M

UNIT-II

3	a	Explain the Process control phenomenon based on different UNIX commands.	CO2	L5	8M
	b	What is meant by semaphore? Mention few advantages of shared memory.	CO2	L2	4M

OR

4		Discuss in brief about Pipes. i) popen ii) pclose	CO2	L3	12M

UNIT-III

5	a	Define: i) Soft real time systems ii) Validation iii) Statistical constraints	CO3	L1	6M
	b	What are the Data types used in real time systems?	CO3	L3	6M

OR

6		Explain in brief about Scheduling Hierarchy.	CO3	L2	12M

UNIT-IV

7	a	Explain Schedule mechanism of real time operating systems.	CO4	L2	6M
	b	What is meant by time services? How those are helpful in operating function?	CO4	L1	6M

OR

8	a	Define task and explain with diagram all the five states of a task.	CO4	L1	6M
	b	Briefly explain priority driven approach and weighted round robin approach.	CO4	L2	6M

UNIT-V

9	a	Explain how process management will be done in RT Linux.	CO5	L2	6M
	b	Explain the Salient features of Semaphore.	CO5	L3	6M

OR

10	a	With suitable example explain about pre emptive scheduling in VX works.	CO5	L4	7M
	b	Explain the significance of context switches in an I/O system.	CO5	L2	5M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
ADVANCED STEEL DESIGN
(Structural Engineering)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

| 1 | Two plates of 10mm thickness and widh 200mm are to be joined using high strength friction bolts (HSFG) of 20mm diameter. Design the joint for maximum strength given that 4.6 grade bolts & Fe 410 steel plates are used. | CO1 | L4 | 12M |

OR

| 2 | Explain about beam-column connection and its classification with neat sketches. | CO1 | L2 | 12M |

UNIT-II

| 3 | Design a purlin section for the following data:
Spacing of roof trusses C/C =5m
Dead load of Roofing = 0.70kN/m
Live load on purlin =1.1kN/m
Wind load on Purlin=-1.5kN/m. | CO2 | L3 | 12M |

OR

| 4 | Briefly explain the various steps involved in the design of a roof truss with a typical figure. | CO2 | L2 | 12M |

UNIT-III

| 5 | Eaplain about the component parts of truss bridge with a sketch. | CO3 | L2 | 12M |

OR

| 6 | The tie of a truss carries an axial tension of 225 kN. Design the section of the member and also the connection of the member to 10 mm thick gusset plate. Use 20 mm diameter rivets. | CO3 | L3 | 12M |

UNIT-IV

| 7 | A simply supported beam of span 6m is subjected to UDL of 20 KN/m. Design a steel beam by plastic design using a combined load factor of 1.7. | CO4 | L3 | 12M |

OR

| 8 | a) | Explain about Idealized stress-strain curve for mild steel. | CO4 | L2 | 12M |
| | b) | Explain about fully plastic moment capacity. | CO4 | L5 | 12M |

9   A hat of 100mm x 80mm x 5mm section with a 30mm lip is to be used   **CO5   L4   12M**
     as concentrically loaded column of effective length 4.0m. Determine the
     allowable load? Take fy =235 N/mm^2 .

OR

10   Find the permissible load on the column shown in the figure below? The   **CO5   L6   12M**
     effective length of the column is 3m.
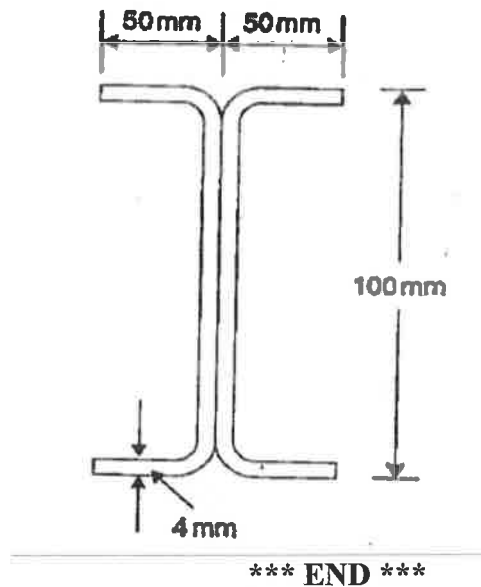
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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular & Supplementary Examinations August-2024
STRUCTURAL DYNAMICS
(Structural Engineering)

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

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

UNIT-I

1	a	Derive the equation of motion for damped single degree of freedom system with forced vibration.	CO2	L3	6M
	b	Briefly explain oscillatory motion.	CO1	L1	6M

OR

2 Explain   CO1   L2   12M
(i) Degree of freedom system, (ii) Harmonic Excitation, (iii) Simple harmonic motion, (iv) D'Alemberts principle

UNIT-II

3 Derive the solution for undamped single degree of freedom system with forced vibration.   CO2   L3   12M
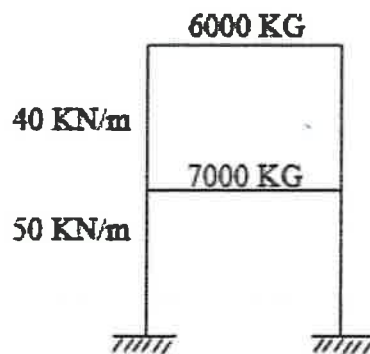
OR

4 Derive the expression for logarithmic decrement for damped free vibration of SDOF for   CO2   L3   12M
i) Two successive cycles   ii) Two cycles of N cycle apart

UNIT-III

5 Briefly explain orthogonal properties of normal modes.   CO4   L2   12M

OR

6 Draw the mode shapes for given problem   CO4   L1   12M

6000 KG

40 KN/m

7000 KG

50 KN/m

UNIT-IV

7 Derive the natural frequency and mode shapes for uniform beam having both end simply supported.   CO5   L3   12M

OR

8 Derive the natural frequency and mode shapes for uniform beam having both end free.   CO5   L3   12M

UNIT-V

9 Explain step by step procedure of Transfer matrix method? Derive fundamental natural frequencies and mode shapes?   CO6   L2   12M

OR

10   Find the fundamental natural frequencies and mode shapes of a vibratory   **CO6**   **L2**   **12M**
system shown in figure by using Transfer matrix method.

*** END ***