LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram-521 230 :: Krishna Dist. :: A.P
Approved by AICTE, New Delhi.   Affiliated to JNTUK, Kakinada

REVISED

M.Tech.(I Semester)(R17) Regular/Supplementary Examinations, December 2018/January 2019
TIME TABLE

A.Y. 2018-19

TIME : 10.15 AM TO 1.15 PM

Date	Computer Science and Engineering	VLSI and Embedded Systems	Thermal Engineering	Power Electronics and Drives
31-12-2018 Monday	17CO01 - Android Technologies	17VE01 - Digital VLSI System Design	17TE01 - Advanced Thermodynamics	17PE01 - Computational Mathematics
02-01-2019 Wednesday	17CO02 - Fundamentals of Data Science	17VE02 - Embedded System Design	17TE02 - Advanced Heat and Mass Transfer	17PE02 - Analysis of Power Converters
04-01-2019 Friday	17CO03 - Machine Learning	17VE03 - CPLD and FPGA Architectures and Applications	17TE03 - Internal Combustion Engines and Pollution	17PE03 - Control of Motor Drives-I
07-01-2019 Monday	17CO05 - Ad-hoc Networks	17VE07 - Image and Video Processing	17TE06 - Statistical Analysis and Design of experiments	17PE05 - HVDC and FACTS *17PE08 - Analysis of Special Electrical Machines*
09-01-2019 Wednesday	17CO08 - Cloud Computing	17VE08 - System Modeling and Simulation *17VE09 - VLSI Design Automation*	17TE07 - Advanced Fluid Mechanics	17PE07 - Machine Modeling and Analysis
11-01-2019 Friday	Add-on-Course-1 17CO90 - High Performance Computing	Add-on-Course-1 17VE90 - Advanced Computer Architecture	Add-on-Course-1 17TE90 - Thermal and Nuclear Power Plant Engineering	Add-on-Course-1 17PE90 - Advanced Power Semiconductor Devices and their Protection

NOTE:(i)   Any omissions or clashes in this time table may please be informed to the Controller of Examinations immediately.
(ii)   Even if government / JNTUK declares holiday on any of the above dates, the examinations shall be conducted as notified.
(iii)   For any clarification in respect of the above examinations, please contact the Controller of Examinations.

Date : 22-12-2018

CONTROLLER OF EXAMINATIONS

PRINCIPAL

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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M.Tech (I Semester) Regular/Supplementary Examinations

17CO90-HIGH PERFORMANCE COMPUTING
(CSE)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
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1(a)	Explain about memory hierarchies and multicore processors.	[6M]
(b)	Define hardware and software multi threading along with advantages.	[6M]

(OR)

2(a)	Distinguish data flow computer and conventional computers.	[6M]
(b)	Analyze any two architectural classification schemes in detail.	[6M]

3(a)	Explain the application of parallel processing in various fields.	[6M]
(b)	Distinguish Shared-memory computers and Distributed-memory computers.	[6M]

(OR)

4(a)	Identify the different programming languages and models available for parallel computing.	[6M]
(b)	Discuss the trends towards parallel processing.	[6M]

5(a)	Discuss the applications of IoT.	[6M]
(b)	Analyze the challenges and issues of IoT.	[6M]

(OR)

6(a)	Explain EPC global architectural framework.	[6M]
(b)	Explain in detail HLSA IoT framework.	[6M]

7(a)	Explain the characteristics of big data and the advantages of big data processing.	[6M]
(b)	Illustrate the Network Functions Virtualization (NFV).	[6M]

(OR)

8(a)	List the components of sensor network.	[6M]
(b)	Explain the limitations of present-day networks.	[6M]

9(a)	Discuss about Cloud Computing Centralized HPC.	[6M]
(b)	Discuss about Massive Online Analysis.	[6M]

(OR)

10(a)	Compare different High-performance Computing (HPC) Paradigms.	[6M]
(b)	Illustrate the Intelligent Mainframe Grid.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17VE90-ADVANCED COMPUTER ARCHITECTURE
(VLSI&ES)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
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1(a)	Build the pipeline computers.	[6M]
(b)	Organize the predictive modeling and simulations applications clearly.	[6M]
	(OR)	
2(a)	Construct the Array computers.	[6M]
(b)	Identify the addressing schemes for main memory with suitable diagrams.	[6M]
3(a)	Illustrate the principles of linear pipelining with suitable diagrams.	[6M]
(b)	Outline the Instruction pre-fetch and branch handling problems with necessary diagrams.	[6M]
	(OR)	
4(a)	Show the pipelined floating point adder and explain with diagram.	[6M]
(b)	Interpret the Data buffering and Busing structures clearly with neat diagrams.	[6M]
5(a)	Compile the Masking and Data routing mechanisms with suitable diagrams.	[6M]
(b)	Create the memory allocation process for SIMD matrix multiplication.	[6M]
	(OR)	
6(a)	Differentiate clearly between Static and Dynamic networks.	[6M]
(b)	Develop the $O(n^2)$ SIMD matrix multiplication algorithm clearly with example.	[6M]
7(a)	Design the Time shared or Common Bus multiprocessor organization with neat diagrams.	[6M]
(b)	Estimate the home memory concept of multiprocessor system.	[6M]
	(OR)	
8(a)	Elaborate the Static priority algorithm with neat diagram.	[6M]
(b)	Formulate the $a^n \times b^n$ Delta network with neat diagram.	[6M]
9(a)	Examine the concept of static data flow computer organization.	[6M]
(b)	Discover the Systolic Array architecture with neat diagrams.	[6M]
	(OR)	
10(a)	Survey the design issues of data flow computers.	[6M]
(b)	Analyze the VLSI arithmetic modules clearly with neat diagrams.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17PE90-ADVANCED POWER SEMICONDUCTOR DEVICES AND THEIR PROTECTION
(PED)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
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1(a)	Discuss the phenomenon of quasi-saturation in BJT.	[6M]
(b)	Develop a fast turn-on gate circuit for MOSFET.	[6M]
	(OR)	
2(a)	Discuss switching characteristics of BJT during turn on.	[6M]
(b)	Explain the structure of MOSFET with a neat sketch.	[6M]
3(a)	Explain I-V characteristics of n-channel IGBT with vertical cross section structure.	[6M]
(b)	List out the operating limits of IGCT's.	[6M]
	(OR)	
4(a)	Recommend steps to be taken by the device user to avoid latch up in IGBT.	[6M]
(b)	Explain switching characteristics of IGCT's.	[6M]
5(a)	Summarize comparative estimates of power device performance using other materials.	[6M]
(b)	Compare JFET based devices versus other power devices.	[6M]
	(OR)	
6(a)	Explain switching characteristics of GTO.	[6M]
(b)	Design various types of high voltage power integrated circuits.	[6M]
7	Explain single-pass inductor design procedure.	[12M]
	(OR)	
8(a)	List out and discuss the common noise sources in switch mode power supply (SMPS).	[6M]
(b)	Explain circuit layout considerations in connecting base drive circuits to power BJT's.	[6M]
9(a)	Explain about thermal equivalent circuit model.	[6M]
(b)	List advantages & disadvantages of selenium voltage suppressors.	[6M]
	(OR)	
10(a)	A capacitor is connected across the secondary of an input transformer, with zero damping resistance R=0.The secondary voltage is V_s=120V, 60Hz. If the magnetizing inductance referred to secondary is L_m=2mH & input supply to the transformer primary is disconnected at an angle of θ =180°of input ac voltage, Determine (i) the initial capacitor value V_0 (ii) the magnetizing current I_0.	[6M]
(b)	Construct a snubber circuit suitable for a thyristor connected with an anti parallel diode.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17TE90-THERMAL AND NUCLEAR POWER PLANT ENGINEERING
(TE)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
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1(a)	Elaborate on recent trends in power generation in India.	[6M]
(b)	Discuss any three different types of synthetic fuels.	[6M]

(OR)

2(a)	Describe the method of flue gas analysis using Orsat apparatus.	[6M]
(b)	Explain the effect of dissociation on combustion temperature.	[6M]

3(a)	Discuss the general layout of steam power plant with necessary elements.	[6M]
(b)	State the function of an economizer. What are steaming and non steaming economizers?	[6M]

(OR)

4(a)	Write a short note on fabric filters and bag houses.	[6M]
(b)	With the help of a neat line sketch describe the working of Fluidized bed boilers.	[6M]

5(a)	Give your inference regarding future scope of combined cycle in nation power requirements.	[6M]
(b)	Discuss the thermodynamic cycles for waste heat recovery.	[6M]

(OR)

6(a)	Discuss the working principle of IGCC power plants with their relative merits.	[6M]
(b)	Discuss possible recovery methods of waste heat.	[6M]

7(a)	Discuss the possible health hazards from nuclear radiation.	[6M]
(b)	How do you think the future power needs of the nation can be met with nuclear power plants?	[6M]

(OR)

8(a)	What do you understand by nuclear fission? What are the essential requirements to cause nuclear fission?	[6M]
(b)	Discuss different bi-products of nuclear power generation.	[6M]

9(a)	Define load curve & discuss its importance.	[6M]
(b)	What is thermocouple? How is it used to measure temperature?	[6M]

(OR)

10(a)	Discuss the criteria for optimum loading a power plant.	[6M]
(b)	Enumerate the methods of pollution control and elaborate any one method in detail.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17CO08-CLOUD COMPUTING
(CSE)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
****

1.	Design framework of sensor-cloud integration.	[12M]

(OR)

2(a)	Categorize the adoption and consumption strategies.	[6M]
(b)	What are the challenges and risks in cloud computing?	[6M]

3(a)	Draw and explain Eucalyptus architecture.	[6M]
(b)	Sketch the VM model and life cycle.	[6M]

(OR)

4.	Design cluster as a service: the logical design.	[12M]

5(a)	Draw the Workflow Management System in the cloud.	[6M]
(b)	Classify scientific applications and services in the cloud.	[6M]

(OR)

6(a)	What is Workflow Management System (WfMS)?	[6M]
(b)	Draw the architecture of HADOOP.	[6M]

7(a)	Explain Map reduce programming model with suitable example.	[6M]
(b)	Write the key advantages of using a private cloud computing infrastructure.	[6M]

(OR)

8(a)	Explain SAGA–Mapreduce.	[6M]
(b)	Write the enterprises demand of cloud computing.	[6M]

9(a)	How Grid and Cloud Technologies can be integrated to offer HPC?	[6M]
(b)	Draw the Flow chart of the Service Level Agreement (SLA) Management in Cloud.	[6M]

(OR)

10(a)	Illustrate the features and scenarios in federation.	[6M]
(b)	Categorize the Phases of SLA management.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17PE07-MACHINE MODELING AND ANALYSIS
(PED)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
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1(a) Draw the basic two pole machine diagrams and primitive machine diagram for the following machines.
(i) Salient pole synchronous machine (ii) Separately excited DC machine. [6M]

(b) What is generalized machine theory? State the restrictions of generalized machine theory. [6M]

(OR)

2(a) List out the voltage equations for Kron's primitive machine in matrix form. What observations are made from the impedance matrix of this machine? [6M]

(b) Visualize the basic two pole machine diagrams and primitive machine diagrams for the following machines:
i) DC compound machine ii) Commutator machine. [6M]

3(a) Discuss in detail about steady state analysis of DC separately excited motor. [6M]

(b) Describe linearization techniques for small perturbation. [6M]

(OR)

4(a) Define transfer function and derive the transfer function of DC series motor. [6M]

(b) Examine the variation of armature current by the sudden application of inertia load on separately excited DC motor. [6M]

5(a) Illustrate the term 'Linear transformation' as used in electrical machines. Support your answer with suitable example. [6M]

(b) Develop the mathematical model of a single phase induction motor with the help of neat schematic diagram. [6M]

(OR)

6(a) On what basis are the transformation carried out in electrical machines? Discuss. [6M]

(b) Design and develop cross field theory of a single phase induction motor. [6M]

7(a) Illustrate the suitability of stationary frames for the induction motor in power system studies. [6M]

(b) Derive the torque equation of 3-phase induction motor from mathematical modeling of motor. [6M]

(OR)

8. Discuss steady state analysis of a three phase induction machine from its mathematical model and obtain its equivalent circuit from its steady state analysis. [12M]

9(a) For a voltage-fed synchronous motor develop the relevant voltages in state variable form. [6M]

(b) Derive expressions for armature mutual inductances of a salient pole synchronous machine from a consideration of its basic parameters. [6M]

(OR)

10. Analyze the modeling of BLDC Motor. [12M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17VE08-SYSTEM MODELING AND SIMULATION
(VLSI&ES)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
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1(a)	Compare the process of event driven models with time driven models.	[6M]
(b)	Explain the characteristic models of systems based on their behavior.	[6M]

(OR)

2(a)	List the system properties with system block diagram and feedback system.	[6M]
(b)	Describe the open loop control system and close loop control system with neat block diagrams.	[6M]

3(a)	Discuss about episodic random processes in system modeling and simulations.	[6M]
(b)	Describe the properties of white noise process in signal simulation.	[6M]

(OR)

4(a)	Summarize the features of random walk with a neat diagram.	[6M]
(b)	Describe the characterizing of random Processor with respect to auto correlation function in simulation and modeling studies.	[6M]

5(a)	Explain the probabilistic models characterizing the Markov chains with transition probabilities.	[6M]
(b)	A game of chance has probability P of winning and probability $Q = 1-P$ of losing. If a gambler wins, the house pays him a dollar, if he loses; he pays the house the same amount. Suppose the gambler and who initially has 2 dollars, decides to play until he is either broke or doubles his money. Draw a transition considering 5 states and write the transition matrix for the above problem using Markov Chain.	[6M]

(OR)

6(a)	Discuss about the basic structures of event driven models with neat diagrams.	[6M]
(b)	Describe the queuing theory concept for modern day operation research with an example.	[6M]

7(a)	Explain correlation between scientific methods and generic modeling and simulation methodology.	[6M]
(b)	Derive the evaluation points of the third sequential search algorithm.	[6M]

(OR)

8(a)	Explain the line searching methods for optimizing an objective function $f(C)$ of a single unknown parameters.	[6M]
(b)	Draw and explain the block diagram of Alpha/beta tracker.	[6M]

9(a)	Mention advantages of simulation packages over programming languages.	[6M]
(b)	Classify varioussimulation software used in system modeling.	[6M]

(OR)

10(a)	How to determine whetherthe simulation model is an accurate representation of the actual system being studied?	[6M]
(b)	What are the necessary steps to be taken for determining the level of model details?	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17TE07-ADVANCED FLUID MECHANICS
(TE)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
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1(a) Deduce an expression for the velocity distribution for viscous flow through a circular pipe and also sketch the distribution of velocity and shear stress across a section of the pipe. [6M]

(b) Crude oil of viscosity 0.97 poise and relative density 0.9 is flowing through a horizontal circular pipe of diameter 100mm and of length 10m. Calculate the difference of pressure at the two ends of the pipe, if 100kg of the oil is collected in a tank in 30 seconds. [6M]

(OR)

2(a) Define stream line, path line and streak line. [6M]

(b) An oil of viscosity 0.1 Ns/m² and relative density 0.9 is flowing through a circular pipe of diameter 50mm and of length 300m. The rate of flow of fluid through the pipe is 3.5 lt/s. Estimate the pressure drop in a length of 300m and also the shear stress at the pipe wall. [6M]

3(a) How will you determine whether a boundary layer flow is attached flow, detached flow or on the verge of separation? [6M]

(b) For the velocity profile $u/U=2(y/\delta)-(y/\delta)2$,find the thickness of boundary layer at the end of the plate and the drag force on one side of a plate 1m long and 0.8m wide when placed in water flowing with a velocity of 150mm per second. Calculate the value of co-efficient of drag also. Take μ for water =0.01 poise. [6M]

(OR)

4(a) Obtain an expression for the boundary shear stress in terms of momentum thickness. [6M]

(b) For the following velocity profiles, determine whether the flow has separated or on the verge of separated or will attach with the surface:
(i)$u/U=3/2(y/\delta)-1/2(y/\delta)^3$
(ii)$u/U=2(y/\delta)^2-(y/\delta)^2$ [6M]

5(a) Deduce the relation between pressure and density of a compressible fluid for (i) Isothermal process (ii) Adiabatic process. [6M]

(b) Calculate the Mach number at a point on a jet propelled air craft , which is flying at 1100Kmph at sea level where air temperature is 20°C.Take k=1.4 and R=287J/kgK. [6M]

(OR)

6(a) Derive the basic equations of compressible flow. [6M]

(b) Air flows from a reservoir (P_0 = 1MN/m² and T_0=40⁰C) through De-laval nozzle with a throat diameter of 0.1m and a maximum Mach number of 0.75. Calculate the mass flow rate, nozzle diameter, velocity, pressure and temperature at the exit where M=0.50. [6M]

7(a) Draw the variation of Mach number along the length of a convergent divergent duct when it acts as a (i) Nozzle (ii) Diffuser (iii) Venturi. [6M]

(b) Air at stagnation condition has a temperature of 800 K, determine the stagnation velocity of sound and the maximum possible fluid velocity. What is the velocity of the sound when the flow velocity is at half the maximum velocity? [6M]

(OR)

8(a) State the assumptions for isentropic flow through variable area ducts. [6M]

(b) Air enters an isentropic diffuser with mach number 3.6 and is decelerated to a mach number of 2 the diffuser passes a flow of 15kg/s. The initial static pressure temperature of air are 1.05 bar and 40⁰Crespectively, Assuming γ=1.4 calculate area, total pressure and total temperature at inlet and exit and static temperature and pressure at exit. [6M]

9(a) State the assumptions made for analysis of Fanno flow. [6M]

(b) Air flows in an insulated duct with velocity of 235m/s, inlet temperature and pressure 13 bar and 270°C. Determine (i) temperature and velocity at section of the duct where the pressure has dropped to 10bar due to friction (ii) the distance between two sections if the diameter is 150mm and friction factor f=0.005. [6M]

(OR)

10(a) Prove that velocity of gas at maximum entropy point is sonic. [6M]

(b) The Mach number of air flowing in a constant area duct has increased from 0.2 to 0.6 because of friction. Calculate the pressure and velocity at the exit of the pipe, if the pressure and temperature at the inlet of the pipe are p = 0.14 MPa and T = 21°C. [6M]

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M.Tech. (I Semester) Regular/Supplementary Examinations

17CO05-Ad-hoc NETWORKS
(CSE)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
****

1(a)	Differentiate Cellular Network with Ad-hoc Networks.	[6M]
(b)	List out the characteristics of an ideal routing-protocol in the context of Ad-hoc Networks.	[6M]

(OR)

2(a)	What are the major requirements for routing protocol in Ad-hoc Networks?	[6M]
(b)	Compare and contrast among Wireless Mesh Networks, Wireless Sensor Networks and Hybrid Wireless.	[6M]

3(a)	Illustrate Ad hoc On Demand Distance Vector (AODV) routing protocol.	[6M]
(b)	Discuss the features of Cluster-Head gateway Switch Routing (CGSR) protocol.	[6M]

(OR)

4.	Elaborate Core Extraction Distributed Ad-hoc Routing (CEDAR) protocol by mentioning its advantages and disadvantages.	[12M]

5(a)	Illustrate any one of the Mesh Based routing protocols in detail.	[6M]
(b)	How does Bandwidth-Efficient Multicast routing protocol handle Multicast routing?	[6M]

(OR)

6(a)	Describe multicast routing protocol based on Zone routing.	[6M]
(b)	How does Core-Extraction Distributed Ad-hoc Routing protocol handle multicast routing?	[6M]

7(a)	List and give brief description on Network Layer Attacks.	[6M]
(b)	What are the network security requirements?	[6M]

(OR)

8.	Enumerate Symmetric and Asymmetric key management algorithms.	[12M]

9(a)	List out the Issues and Challenges in providing QoS in Ad-hoc networks.	[6M]
(b)	Briefly explain On-Demand QoS Routing Protocol and list its advantages& disadvantages.	[6M]

(OR)

10(a)	Classify the Energy Management Schemes.	[6M]
(b)	What is the need for Energy Management in Ad-hoc wireless networks? Explain briefly.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations
17VE07-IMAGE AND VIDEO PROCESSING
(VLSI&ES)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
****

1(a)	Define Wavelet. What are different wavelet transforms and explain in brief?	[6M]
(b)	What are 1D, 2D, 3D functions? How they can be represented? Explain with examples.	[6M]

(OR)

2.	Compute DCT matrix for the value of N=4.	[12M]

3.	What is histogram? Obtain Histogram equalization for the following image segment of size 5 x 5. Write the inference on image segment before and after equalization.	

20	20	20	18	16
15	15	16	18	15
15	15	19	15	17
16	17	19	18	16
20	18	17	20	15

[12M]

(OR)

4(a)	Define image enhancement. Give the list of different image enhancement techniques with a brief note.	[6M]
(b)	Differentiate between smoothing and sharpening filters in enhancement process.	[6M]

5(a)	Define image compression. What are the advantages of image compression?	[6M]
(b)	Discuss the following terms. (i) Lossy compression (ii) Loss-less compression.	[6M]

(OR)

6(a)	Create a code for given set of symbols with probabilities using Huffman coding technique.	

a1	0.1
a2	0.4
a3	0.06
a4	0.1
a5	0.04
a6	0.3

[6M]

(b)	How compression can be achieved by using lossy predictive coding, explain with the help of block diagram?	[6M]

7(a)	What is the necessity of digital video? Explain in brief about digital video signal, digital video standards.	[6M]
(b)	Describe the follow terms (i) Eulerian angles of rotation (ii) Rotation about an arbitrary axis.	[6M]

(OR)

8(a)	Discuss about modeling of the relative 3-D motion between the camera and the objects in the scene.	[6M]
(b)	Discuss about Deformable motion models in brief.	[6M]

9(a)	What is optical flow equation? Explain about two-dimensional motion versus optical flow.	[6M]
(b)	How block based transform coding is useful for 2-D motion estimation.	[6M]

(OR)

10(a)	Illustrate multi resolution motion estimation using HBMA.	[6M]
(b)	List out three fast algorithms and explain about their search procedure.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17PE05-HVDC AND FACTS
(PED)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
****

1(a)	Summarize the advantages and disadvantages of HVDC transmission.	[6M]
(b)	Illustrate the principle of DC link control.	[6M]

(OR)

2(a)	Draw the schematic diagram of HVDC converter station and describe the function of each block.	[6M]
(b)	Describe the desired features of converter control.	[6M]

3.	Discuss the converter mal operations.	[12M]

(OR)

4(a)	Describe the functions of smoothing reactor.	[6M]
(b)	What are the causes of over voltages in a converter station? Suggest the methods for protection against over voltages in converter station.	[6M]

5(a)	Discuss the technical benefits of FACTS technology.	[6M]
(b)	Analyze the power flow considerations of a transmission interconnected systems.	[6M]

(OR)

6(a)	Discuss the problems relating to AC power transmission. How they can be overcome using FACTS techniques?	[6M]
(b)	Discuss the various categories of FACTS controllers.	[6M]

7(a)	Describe any of the variable impedance type static VAR generators.	[6M]
(b)	Analyze the operating features of STATCOM.	[6M]

(OR)

8(a)	Discuss improvement of transient stability using series compensation on transmission systems.	[6M]
(b)	Describe the principle of operation of a TCSC, clearly indicating the different modes of operation.	[6M]

9(a)	Deduce that a UPFC can perform all the functions of the traditional compensating devices used in a power system.	[6M]
(b)	Illustrate the overall UPFC control structure.	[6M]

(OR)

10(a)	Discuss the basic operating principles of Interline Power Flow Controller (IPFC).	[6M]
(b)	Describe the salient features of Interline Power Flow Controller (IPFC).	[6M]

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M.Tech (I Semester) ~~Regular~~/Supplementary Examinations

17PE08-ANALYSIS OF SPECIAL ELECTRICAL MACHINES
(PED)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
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1(a) Explain any one of the drive circuit of variable reluctance stepper motor with block diagram.   [6M]

(b) Develop the torque equation of a variable reluctance stepper motor.   [6M]

(OR)

2. Demonstrate the construction and working of variable reluctance stepper motor.   [12M]

3(a) Illustrate the phasor diagram of Synchronous reluctance motor.   [6M]

(b) Demonstrate the constructional features of radial air gap Synchronous reluctance motor.   [6M]

(OR)

4(a) Develop the EMF equation of PMSM.   [6M]

(b) Construct the torque equation of PMSM.   [6M]

5(a) Explain the torque-speed characteristics of Switched Reluctance motor. [6M]

(b) Discuss about the sensorless control of Switched Reluctance motor.   [6M]

(OR)

6(a) What is hysteresis current control? Explain the hysteresis type current regulator.   [6M]

(b) Compare Switched Reluctance motor and variable reluctance stepper motor.   [6M]

7. Illustrate the microprocessor based control of BLDC motor with block diagram.   [12M]

(OR)

8(a) Explain the torque-speed characteristics of BLDC motor.   [6M]

(b) Compare the mechanical and electronic commutators.   [6M]

9(a) Explain the concept of current sheet.   [6M]

(b) Explain principle of working of Linear Induction motor.   [6M]

(OR)

10(a) Discuss the control applications of DC Linear motor.   [6M]

(b) Discuss about the performance equations of Linear Synchronous motor.   [6M]

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M.Tech (I Semester) Regular/Supplementary Examinations
17TE06-STATISTICAL ANALYSIS AND DESIGN OF EXPERIMENTS
(TE)

Time : 3 hours $\hspace{6cm}$ Max. Marks : 60

All questions carry equal marks
****

1(a)	Write some typical applications of experimental design.	[6M]
(b)	A shipment of components consists of three identical boxes. One box contains 2000 components of which 25% are defective, the second box contains 5000 components of which 20% are defective and the third box contains 2000 components of which 600 are defective. A box is selected at random and a component is drawn at random from the box. (i) What is the probability that drawn component is defective? (ii) What is the probability that the defective component came from the second box?	[6M]

(OR)

2(a)	What are the basic principles of experimental design and explain?	[6M]
(b)	A lot of semiconductor chips have 20 defective chips. Two chips are selected at random without replacement from the lot. i. What is the probability that the first one selected is defective? ii. What is the probability that the second one selected is defective, given that the first one was defective? iii. What is the probability that both are defective?	[6M]

3(a)	If the probability that an individual suffers from a bad reaction due to a certain injection is 0.001, determine the probability that out of 2000 individuals (i) exactly 3 (ii) more than 2 individuals will suffer a bad reaction.	[6M]
(b)	The daily consumption of electric power (in million of KW-hours) is a random variable having the probability density function $$f(x) = \frac{1}{9}xe^{-x/3}, x > 0, \text{ and } f(x) = 0 \text{ if } x \le 0.$$ If the total production is 12 million KW-hours, determine the probability that there is power cut (shortage) on any given day. Also find the average daily consumption of electric power.	[6M]

(OR)

4(a)	The number of mistakes counted in one hundred typed pages of a typist revealed that he made 2.8 mistakes on an average per page. Find the probability that (i) there is no mistake (ii) there are two or less mistakes in a page typed by him.	[6M]
(b)	In a certain junior Olympics, javelin throw distances are well approximated by a Gaussian distribution for which $\mu = 30$m and $\sigma = 5$m. In a qualifying round, contestants must throw farther than 26m to qualify. In the main event, the record throw is 42m. (i) What is the probability of being disqualified in the qualifying round? (ii) In the main event, what is the probability that the record will be beaten.	[6M]

5(a)	The viscosity of a liquid detergent is supposed to average 800 centistokes at 25°C. A random sample of 16 batches of detergent is collected, and the average viscosity is 812. Suppose we know that the standard deviation of viscosity is 25 centistokes. (i) State the hypotheses that should be tested. (ii) Test these hypotheses using 0.05. What are your conclusions? (iii) What is the P-value for the test? (iv) Find a 95 percent confidence interval on the mean.	[6M]

(b)   What is the statistical procedure to test the Hypothesis?   [6M]

(OR)

6(a)   The measurements of the output of two units have given the following results. Assuming that both samples have been obtained from the normal populations at 10% significant level, test whether the two populations have the same variance.

Unit-A	14.1	10.1	14.7	13.7	14.0
Unit-B	14.0	14.5	13.7	12.7	14.1

[6M]

(b)   Samples of two types of electric light bulbs were tested for length of life and following data were found.

	Type I	Type II
Sample size	$n_1=8$	$n_2=7$
Sample mean	1234	1036
Sample standard deviation	$s_1=36$	$s_2=40$

Is the difference in the means significant to warrant that type I is superior to type II regarding length of life.   [6M]

7.   A manufacturing of television sets is interested in the effect on tube conductivity of four different types of coating for color picture tubes. A completely randomized experiment is conducted and the following conductivity data are obtained.

Coating type	conductivity			
1	143	141	150	146
2	152	149	137	143
3	134	136	132	127
4	129	127	132	129

(a) Is there a difference in conductivity due to coating type? Use 0.05.
(b) Estimate the overall mean and the treatment effects.   [12M]

(OR)

8.   Three different washing solutions are being compared to study their effectiveness in retarding bacteria growth in 5-gallon milk containers. The analysis is done in a laboratory, and only three trials can be run on any day. Because days could represent a potential source of variability, the experimenter decides to use a randomized block design. Observations are taken for four days, and the data are shown here. Analyze the data from this experiment (use 0.05) and draw conclusions.

Solution	Day			
	1	2	3	4
1	13	22	18	39
2	16	24	17	44
3	5	4	1	22

[12M]

9(a)   The tensile strength of a paper product is related to the amount of hardwood in the pulp. Ten samples are produced in the pilot plant, and the data obtained are shown in the following table

strength	160	171	175	182	184	181	188	193	195	200
% Hardwood	10	15	15	20	20	20	25	25	28	30

(i) Fit a linear regression model relating strength to percent hardwood.
(ii) Estimate strength when hardwood percentage is 35.   [6M]

(b)   Write the analysis of crossed array design.   [6M]

(OR)

10(a)   A study was performed on wear of a bearing y and its relationship to x1=oil viscosity and x2=load. The following data were obtained:

Y	193	230	172	91	113	125
X1	1.6	15.5	22	43	33	40
X2	851	816	1058	1201	1357	1115

(i)   Fit a multiple linear regression model to the data.
(ii)   Estimate y when x1= 25 and x2 = 900.   [6M]

(b)   Discuss some aspects of selecting appropriate designs for fitting response surface.   [6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17CO03-MACHINE LEARNING
(CSE)

Time : 3 hours　　　　　　　　　　　　　　　　　　　　　　Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
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1(a)	Describe the basic design issues and approaches to machine learning.	[6M]
(b)	Briefly explain about different Machine Learning applications.	[6M]

(OR)

2(a)	Explain in detail the version spaces approach to concept learning.	[6M]
(b)	Present the Candidate Elimination Algorithm and illustrate its steps using suitable example.	[6M]

3(a)	Describe the main steps of the supervised training algorithm.	[6M]
(b)	List some commercial practical applications of Artificial Neural Networks.	[6M]

(OR)

4(a)	A fully connected feedforward network has 10 source nodes, 2 hidden layers, one with 4 neurons and the other with 3 neurons, and a single output neuron. Construct an architectural graph of this network.	[6M]
(b)	Write a short note on remarks on genetic programming.	[6M]

5(a)	Elaborate the concept of Maximum Likelihood with examples.	[6M]
(b)	Write Gibbs algorithm. Explain it.	[6M]

(OR)

6(a)	By means of an example demonstrate classification using naive bayesian classifier.	[6M]
(b)	Explain about Expected Maximization algorithm.	[6M]

7(a)	Describe k-Nearest Neighbor learning.	[6M]
(b)	Explain Learning First Order Rules.	[6M]

(OR)

8.	Explain about sequential covering algorithms.	[12M]

9.	Discuss about various Inductive –Analytical approaches.	[12M]

(OR)

10(a)	What is the expectation of reward function in reinforcement learning?	[6M]
(b)	Explain FOCL Algorithm.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17VE03-CPLD AND FPGA ARCHITECTURES AND APPLICATIONS
(VLSI&ES)

Time : 3 hours

Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
****

1(a)	Design 2-bit comparator using PROM.	[6M]
(b)	Explain the architecture of XCR3064XL CPLD with neat sketch.	[6M]

(OR)

2(a)	Compare features of PLA, PAL and PROM.	[6M]
(b)	Design Full Adder combinational function using PLA.	[6M]

3(a)	Differentiate between a CPLD and FPGA.	[6M]
(b)	Explain the design flow of an FPGA.	[6M]

(OR)

4(a)	Evaluate FPGA architectures.	[6M]
(b)	Interpret FPGA Programmable interconnects.	[6M]

5(a)	Evaluate the architecture of Xilinx FPGA 4000 series Configurable Logic Block.	[6M]
(b)	Interpret the routing architecture of Xilinx FPGA 4000 series.	[6M]

(OR)

6(a)	Analyze the architecture of Xilinx FPGA 3000 series Configurable Logic Block.	[6M]
(b)	Examine the architecture of Xilinx FPGA 3000 series IO block.	[6M]

7(a)	Explain the simple logic module and simple I/O Module of ACT1 FPGA.	[6M]
(b)	Evaluate the device Architecture of Actel FPGA.	[6M]

(OR)

8.	Compare Architectural features of ACT1, ACT2 and ACT3.	[12M]

9(a)	Construct 16-bit Accumulator with Actel FPGA.	[6M]
(b)	Design a 3 bit binary synchronous counter with Actel FPGA.	[6M]

(OR)

10.	Create Five Bit Binary Counter with Actel FPGA.	[12M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17PE03-CONTROL OF MOTOR DRIVES-I
(PED)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
****

1. Describe the steady state analysis of a three phase fully controlled converter. fed series DC motor drives and draw its speed torque characteristics. [12M]

(OR)

2. Describe in detail the operation of a full converter, feeding a separately excited DC motor with reference to voltage and current waveforms assuming that the motor current is continuous. [12M]

3. Analyse the steady state behavior of a class A chopper circuit with battery V_s, with resistive load and duty cycle δ, sketch waveforms of the voltages across the switch and the diode. Derive expressions for I_{max}, I_{min} and average current. [12M]

(OR)

4. For a class A chopper circuit, derive an expression for the output power with resistive load. Calculate the per unit value of this for
   (i) δ (1/4)   (ii) δ (3/4). [12M]

5(a) Draw and explain the speed-torque curves with variable frequency control for two different modes.
   i.   Operation at constant flux
   ii.   Operation at constant (V/f) ratio. [6M]
 (b) Explain efficiency optimization control by flux program. [6M]

(OR)

6. Explain the independent current and frequency control of induction motor. [12M]

7. A 2.8KW,400V,50HZ,4pole,1370rpm,delta connected squirrel-cage induction motor has following parameters referred to the stator:R_s=2Ω,R'_r=5 Ω,X_s=X'_r=5Ω,X_m=80Ω.Motor speed is controlled by stator voltage control. When driving a fan load it runs at rated speed at rated voltage. Calculate (i) motor terminal voltage, current and torque at 1200rpm and (ii) motor speed, current and torque for the terminal voltage of 300V. [12M]

(OR)

8. Explain the speed control of induction motor from rotor side using
   (i) Static Kramer drive
   (ii) Static Scherbius drive. [12M]

9. A flux weakening controller is least parameter- sensitive in the stator and rotor flux linkages based vector controllers. Comment on the veracity of this statement. [12M]

(OR)

10(a) Explain the algorithm for the direct vector control process of an induction motor. [6M]
  (b) What is the significance of vector control method? [6M]

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M.Tech. (I Semester) Regular/Supplementary Examinations

17TE03-INTERNAL COMBUSTION ENGINES AND POLLUTION
(TE)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
****

1(a)	Confer the function of following components of an IC engine (i) Piston (ii) Connecting Rod (iii) Flywheel	[6M]
(b)	Distinguish between SI engine and CI engine.	[6M]

(OR)

2(a)	Illustrate the working principle of turbo charging of a single cylinder diesel engine.	[6M]
(b)	Distinguish between theoretical and actual valve timing diagrams of a petrol engine.	[6M]

3(a)	Describe the phenomenon of detonation or knocking in SI engines.	[6M]
(b)	Discuss various factors that influence the flame speed during combustion in SI engine.	[6M]

(OR)

4(a)	List out the various types of indirect combustion chambers used in CI engines and explain the working principle of air cell combustion chamber with neat sketch.	[6M]
(b)	Elucidate the factors effecting combustion in dual-fuel engines.	[6M]

5(a)	Illustrate the working principle of variable compression ratio diesel engine.	[6M]
(b)	What are the merits of variable compression ratio diesel engine over the fixed compression ratio diesel engine?	[6M]

(OR)

6(a)	Explicate the Volkswagen PCI stratified charge engine with neat sketch.	[6M]
(b)	Illustrate the working principle of beta stirling engine.	[6M]

7(a)	Elucidate the working of LPG fuel feed system in petrol engine with a neat sketch.	[6M]
(b)	Describe the working principle of surface-ignition alcohol CI engine with a neat sketch.	[6M]

(OR)

8(a)	Elucidate the advantages and disadvantages of LPG.	[6M]
(b)	A four stroke diesel engine has a cylinder bore of 150 mm and a stroke of 250 mm. the crank shaft speed is 300 rpm and fuel consumption is 1.2 kg/h, having a calorific value of 39900 kJ/kg. The indicated mean effective pressure is 5.5 bars. If the compression ratio is 15 , cutoff ratio is 1.8 and $\gamma=1.4$.Estimate (i)Indicated power (ii)Indicated thermal efficiency (iii)relative efficiency.	[6M]

9(a)	List out the pollution norms for IC engines.	[6M]
(b)	What are the major sources of pollutants from petrol engine?	[6M]

(OR)

10(a)	Illustrate the mechanism of smoke formation in diesel engine.	[6M]
(b)	Elucidate the working principle of a three way catalytic converter and state the equations of reactions.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17CO02-FUNDAMENTALS OF DATA SCIENCE
(CSE)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
****

1(a)   Define Data Science. How do you relate the current landscape of Data
       Science with Drew Conwa 's Venn diagram?   [6M]
 (b)   What is Datafication? Discuss its significance in creating hype to Big
       Data and Data Scinece.   [6M]

(OR)

2.   Summarize the workflow process implemented by Data Scientist
       to analyze data. Justify with an example.   [12M]

3(a)   What are the types of exploratory data analysis process stages
       involved in Data Science? Explain them with examples.   [6M]
 (b)   How do you analyze and interpret a statistical summary results of
       a dataset?   [6M]

(OR)

4(a)   Illustrate the various types of Data Visualization plots with examples.   [6M]
 (b)   Why is a Hypothesis test done in exploratory data analysis? Compare
       and contrast the Null hypothesis with the Alternative hypothesis.   [6M]

5(a)   Write a short on the different types of variables accessible in modeling
       data. Explain them with examples.   [6M]
 (b)   Explain the concept of linear regression with suitable examples.   [6M]

(OR)

6(a)   How do you estimate error and infer conclusions from a model with
       MSE, RMSE, and MAE.   [6M]
 (b)   What is a Confusion Matrix? Demonstrate its outcome with an
       appropriate example.   [6M]

7(a)   Justify with a suitable example why PCA is used in Dimension
       reduction of a dataset.   [6M]
 (b)   What are Decision trees? Highlight its importance in Data Science
       with an example to perceive knowledge in data.   [6M]

(OR)

8(a)   How is supervised learning different from unsupervised learning.
       Justify?   [6M]
 (b)   Build a classification model using k-NN and evaluate its outcome.   [6M]

9(a)   What is a time series data? Discuss its real-world applications in
       detail.   [6M]
 (b)   Explain about the procedure formulated by Data Scientists to analyze
       time series data.   [6M]

(OR)

10(a) In what ways the time series data is influenced by ACF and PACF?   [6M]
  (b) Explain the role of ARIMA models in plotting time series data.   [6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17VE02-EMBEDDED SYSTEM DESIGN

(VLSI&ES)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
****

1(a)	What is an embedded system? Why is it so hard to define?	[6M]
(b)	List and define the three main characteristics of embedded system that distinguish such systems from other computing systems.	[6M]

(OR)

2(a)	Discuss various key technologies used for an embedded system design.	[6M]
(b)	Demonstrate design metric NRE cost with an example.	[6M]

3(a)	Illustrate the models commonly used for describing embedded systems.	[6M]
(b)	State difference between a computational model and a language, and also between a textual language and a graphical language.	[6M]

(OR)

4(a)	Discuss program state machine model in detail with an example.	[6M]
(b)	Explain concurrent process model using the set top box embedded system.	[6M]

5(a)	Explain ARM programmer's model in detail.	[6M]
(b)	Describe ARM's data transfer instructions with examples.	[6M]

(OR)

6(a)	Write ARM assembly language program to find smallest number in array of ten 32 bit numbers.	[6M]
(b)	Summarize ARM assembly directives and explain with simple program.	[6M]

7.	Analyze 3-stage pipeline ARM organization and list out its features.	[12M]

(OR)

8(a)	Explain ARM instruction set with examples.	[6M]
(b)	Illustrate Thumb instruction set with examples.	[6M]

9(a)	Classify design process models for general purpose processors and explain in detail.	[6M]
(b)	What is reuse feature of design technology and how it impact on time to market design metric?	[6M]

(OR)

10.	Compare full custom IC technology, semi-custom IC technology and PLD IC technology.	[12M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17PE02-ANALYSIS OF POWER CONVERTERS
(PED)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
****

1(a)	Deduce the steady state analysis of single stage boost power factor corrected rectifier.	[6M]
(b)	Evaluate the input power factor and harmonic factors for a Three-Phase half controlled converters.	[6M]

(OR)

2(a)	What are the various power factor improvement methods in converters? Discuss any two of them with relative merits and demerits.	[6M]
(b)	Summarize the following terms: i) Input power factor ii) Displacement factor iii) Harmonic factor iv) Total harmonic distortion and derive the relation between input p.f. and displacement factor.	[6M]

3(a)	With neat circuit diagram analyze the operation of a step up converter in continuous current mode.	[6M]
(b)	Analyze step down dc chopper for RL load with necessary waveforms.	[6M]

(OR)

4(a)	Analyze type- A and type- E dc chopper circuits with relavent diagrams and waveforms.	[6M]
(b)	A dc chopper operating from a 220V dc supply feeds a load of resistance of 50 in series with an inductance of 30mH. The chopper frequency is 200Hz and on-time of the chopper is 1.2ms. Determine the limits of variation of load current.	[6M]

5.	A 3 phase-star connected balanced resistances are supplied from a 3 phase-AC voltage controller. Derive the expression for R.M.S value of load current in the complete range of firing angles. Draw the waveforms of load current.	[12M]

(OR)

6(a)	Describe the basic principle of working of single phase to single phase step down cyclo converter for both continuous and discontinuous conductions for a bridge type cyclo converter with circuit and waveforms.	[6M]
(b)	Discuss about synchronous tap changers. Give the applications.	[6M]

7(a)	Describe the single PWM and multiple PWM techniques of a single phase inverter.	[6M]
(b)	Analyze sinusoidal PWM and modified sinusoidal PWM techniques of a single phase inverter.	[6M]

(OR)

8.	Analyze the space vector PWM technique as applicable to 3-phase inverter control with neat schematic diagrams.	[12M]

9(a)	Decribe the operation of modified diode-clamped multilevel inverter.	[6M]
(b)	Compare various merits and demerits of multilevel inverters.	[6M]

(OR)

10(a)	Describe the single phase flying capacitors multilevel inverter operation.	[6M]
(b)	Compare flying capacitor multilevel inverter with diode-clamped multilevel inverter.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17TE02-ADVANCED HEAT AND MASS TRANSFER
(TE)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
****

1(a) Discuss briefly the different modes of heat transfer and their governing laws. [6M]

(b) A motor body is 360 mm in outside diameter and 240 mm long. It's surface temperature should not exceed 55⁰C when dissipating 340 W. Longitudinal fins of 15mm thickness and 40 mm height are proposed. The convection heat transfer coefficient is 40W/m² ⁰C. Determine the number of fins required. Atmospheric temperature is 30⁰C. Thermal conductivity = 40 W/m⁰C. [6M]

(OR)

2(a) Show that temperature distribution in solid cylinder of radius R with uniform internal heat generation is given by $(\theta/\theta_{max}) = 1 - (r/R)^2$ where $\theta = (T - T_w)$ and $\theta_{max} = (T_{max} - T_w)$. [6M]

(b) Distinguish between Fin efficiency and Fin effectiveness and derive an expression for efficiency of a pin fin whose end is insulated. [6M]

3(a) Explain the importance of Biot, Fourier numbers and use of Heisler charts in solving Transient heat conduction problems. [6M]

(b) A long cylindrical bar (k=17.4 W/m⁰C), $\alpha = 0.019\ m^2/h$) of radius 80 mm comes out of oven at 830⁰C throughout and is cooled by quenching it in a large bath of 40⁰C coolant. The surface coefficient of heat transfer between bar surface and coolant is 180 W/m² ⁰C. Determine: (i) The time taken by the shaft centre to reach 120 ⁰C (ii) The surface temperature of the shaft when its centre temperature is 120⁰C. [6M]

(OR)

4. Consider a two dimensional steady state heat conduction equation with the internal heat generation and obtain finite difference form of it for an interior node say (m,n). [12M]

5(a) Using the integral energy equation for the laminar boundary layer over a flat plate determine an expression for heat transfer coefficient under the conditions $u = u_\alpha$ = constant and $\{(T - T_w)/(T_\alpha - T_w)\} = (y/\delta_t)$. [6M]

(b) Atmospheric air at $T_\alpha = 250\ K$ and a free stream velocity $u_\alpha = 30m/s$ flows across a circular cylinder of diameter D=2.5 cm. The surface of the cylinder is maintained at a uniform temperature $T_w = 350K$. (i) Calculate the average heat transfer coefficient h_m (ii) Determine the heat transfer rate Q per 1 m length of the cylinder. [6M]

(OR)

6(a) Calculate the rate of heat loss from a human body with a typical energy intake from consumption of food (5440 kJ/day). Consider the body as vertical cylinder 30 cm in diameter and 175 cm height in still air. Assume skin temperature to be 37 C and ambient air at 13C. [6M]

(b) A 30cm long glass plate is hung vertically in the air at 27°c while its temperature maintained at 77°c. Calculate the boundary layer thickness at the trailing edge of the plate.
If a similar plate is placed in a wind tunnel and air is blown over it at a velocity of 4m/s. Estimate the boundary layer thickness at its trailing edge. [6M]

7(a) Mark a neat sketch of Pool boiling curve showing different regimes of boiling and briefly discuss about them. [6M]

(b) Water at atmospheric pressure is to be boiled in polished copper pan. The diameter of the pan is 350mm and is kept at 115^0C. Calculate the following: (i) Power of burner; (ii) Rate of evaporation in kg/h (iii) Critical heat flux for these conditions. [6M]

(OR)

8(a) State and derive Stefan Boltzman's law of radiation. [6M]

(b) Liquid oxygen(boiling temperature = -182 ^0C) is to be stored in spherical container of 30 cm diameter. The system is insulated by an evacuated space between inner space and surroundings 45 cm inner diameter concentric sphere. For both spheres $\varepsilon = 0.03$ and temperature of the outer sphere is 30 ^0C. Estimate the rate of heat flow by radiation to the oxygen in the container. [6M]

9(a) Define (i) Sherwood (ii) Schmidt and (iii) Lewis numbers. [6M]

(b) Air at 1 atm, 30^0C containing small quantities of Iodine flow with a velocity of 5.5 m/s inside a 3.0 cm diameter tube. Determine the mass transfer coefficient for Iodine transfer from the gas stream to the wall surface. If Cm is the mean concentrate of Iodine in Kg mol/m³ in the air stream, Determine the rate of deposition of Iodine on the tube surface where the Iodine concentration is zero. [6M]

(OR)

10(a) Define (i) Diffusion coefficient and (ii) Mass transfer coefficient. [6M]

(b) O_2 gas at 25^0C and a pressure of 2 bar is flowing through a rubber pipe of inside diameter 25 mm and wall thickness 2.5mm. The diffusivity of O_2 through rubber is 0.21 x $10^{-2} m^2/s$ and the solubility of O_2 in rubber is 3.12 x10^{-3} $kmol/m^3$.bar. Find the loss of O_2 by diffusion per metre length of pipe. [6M]

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1(a) Draw the Architecture of Android Platform and explain briefly. [6M]

(b) Define Activity. Create an Application that demonstrates the lifecycle of an Activity. [6M]

(OR)

2(a) What is AVD? Explain its importance in Android Application Development. [6M]

(b) How one can organize resources for a given Application? Justify. [6M]

3(a) Design a Relative Layout with variable no of children, which are relative to the parent. [6M]

(b) Why we use Density Independent Pixels (DP) and Scale Independent Pixels (SP) as units for measuring Screen and Text respectively? Justify. [6M]

(OR)

4(a) Explain about Table Layout with an Example. [6M]

(b) Design a Birthday Card Application using Relative Layout. [6M]

5(a) Discuss about Notifications in Android. [6M]

(b) Create an Application that demonstrates the concept of implicit intents. [6M]

(OR)

6(a) Design an Application that demonstrates the concept of explicit intents. [6M]

(b) Create an Application that opens an SMS Activity. [6M]

7. Illustrate the concept of saving data using Shared Preferences in Android. [12M]

(OR)

8. Create an Application that demonstrates the usage of database in Android. [12M]

9. Develop a native application that uses GPS location information. [12M]

(OR)

10. Design a mobile application that creates alarm clock. [12M]

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

M.Tech (I Semester) Regular/Supplementary Examinations

17VE01-DIGITAL VLSI SYSTEM DESIGN
(VLSI&ES)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
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1(a)	Differentiate mealy and moore FSMs.	[6M]
(b)	Implement AND-OR-NOT logic by using CMOS logic.	[6M]

(OR)

2(a)	Explain the concept of hazards in combinational circuits in detailed with solution.	[6M]
(b)	Design a Moore machine to detect a sequence of 101.	[6M]

3(a)	Mention the different loops used in verilog.	[6M]
(b)	Write the verilog module for 8X1 multiplexer.	[6M]

(OR)

4(a)	What is the general structure of a verilog module? Explain in detail.	[6M]
(b)	Illustrate Data types and Operators in verilog.	[6M]

5(a)	What is array multiplier? Explain.	[6M]
(b)	Construct the Behavioral verilog code for BCD to 7-Segment Decoder.	[6M]

(OR)

6(a)	Explain about concept behind keypad scanner.	[6M]
(b)	With neat diagram explain about binary divider.	[6M]

7(a)	With an example construct an SM chart from state graph.	[6M]
(b)	Construct an SM chart for a Binary Multiplier.	[6M]

(OR)

8(a)	Draw the SM chart for Dice game controller using Two-address microcode.	[6M]
(b)	Demonstrate the micro programmed system with hardware.	[6M]

. 9(a)	Compose the syntax and example for.Verilog Tasks.	[6M]
(b)	With an example explain about User-Defined Primitives.	[6M]

(OR)

10(a)	Interpret File I/O Functions.	[6M]
(b)	Tell about RISC Philosophy.	[6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17PE01-COMPUTATIONAL MATHEMATICS
(PED)

Time : 3 hours   Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
****

1. Find the eigen values and the corresponding Generalized eigen vectors

   of $A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$.   [12M]

   (OR)

2. Find the eigen values and the corresponding Generalized eigen vectors

   of $A = \begin{bmatrix} 2 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 \\ 2 & 0 & 3 & 0 \\ 1 & 4 & 2 & -6 \end{bmatrix}$.   [12M]

3(a) If $U(z) = \dfrac{2z^2 + 3z + 12}{(z-1)^4}$, find the values of u_0, u_1, u_2 and u_3.   [6M]

(b) Using the inversion integral method (Residue method), find the inverse

   Z-transform of $\dfrac{2z}{\left[(z-1)(z^2+1)\right]}$.   [6M]

   (OR)

4(a) Using Z-transforms solve the difference equation $y_{n+2} + 2y_{n+1} + y_n = 0$,

   given that $y_0 = y_1 = 0$.   [6M]

(b) Using the inversion integral method, find the inverse Z-transform of

   $\dfrac{z^2 + z}{\left[(z-1)^2(z^2+1)\right]}$.   [6M]

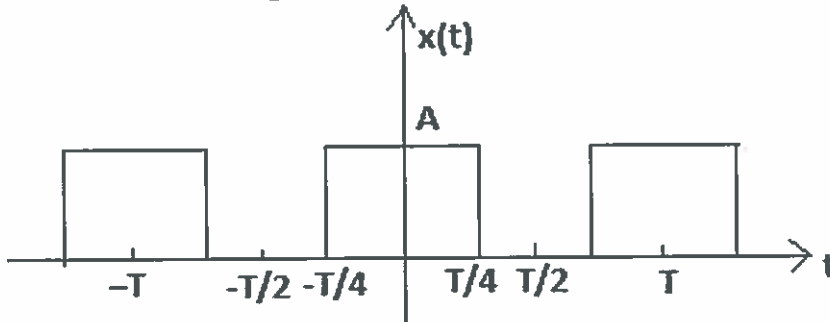5(a) Obtain Fourier Series of half wave rectified sine wave.

          [6M]
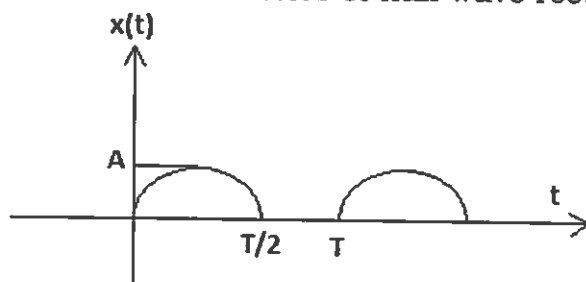
(b) Obtain the Fourier series for $f(x)=e^{-x}$ in the interval $0<x<2\pi$. [6M]

(OR)

6(a) Determine the trigonometric Fourier series of the waveform

[6M]

(b) Expand $f(x)=e^{-x}$ as a Fourier series in the interval $(-l,l)$. [6M]

7. Compute the 8 point DFT for the following sequences using DIT – FFT

algorithm $x(n)=\begin{cases}1 & -3\le n\le 3 \\ 0 & otherwise\end{cases}$. [12M]

(OR)

8. Compute the 8 point DFT of the sequence $x(n)=\{0,1,2,3,4,5,6,7\}$ using radix -2 DIF algorithm. [12M]

9(a) On which curve the functional $\int_{0}^{\frac{\pi}{2}}\left((y')^{2}-y^{2}+2xy\right)dy$ with $y(0)=0$ and

$y\left(\frac{\pi}{2}\right)=0$, be extremized? [6M]

(b) Solve the boundary value problem $y''-y+x=0 \ (0\le x\le 1)$,

$y(0)=y(1)=0$ by Rayleigh-Ritz method. [6M]

(OR)

10(a) Find the extremal of the functional $\int_{0}^{\pi/2}\left(y^{2}+(y')^{2}-2y\sin x\right)dx$,

$y(0)=y\left(\frac{\pi}{2}\right)=0$. [6M]

(b) Using Galerkin method to solve the boundary value problem

$y''=3x+4y$, $y(0)=0$, $y(1)=1$ [6M]

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M.Tech (I Semester) Regular/Supplementary Examinations

17TE01-ADVANCED THERMODYNAMICS
(TE)

Time : 3 hours   Max. Marks : 60

All questions carry equal marks
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1(a) What are the limitations of first law of thermodynamics and also deduce the steady flow energy equation with one application? [6M]

(b) A blower handles 1 kg/s of air at 20 °C and consumes a power of 15 kW. The inlet and outlet velocities of air are 100 m/s and 150 m/s respectively. Find the exit air temperature, assuming adiabatic conditions. Take Cp of air as 1.005 kJ/kg K. [6M]

(OR)

2(a) State Joule-Kelvin Coefficient. Why is it zero for an ideal gas? [6M]

(b) Establish the Maxwell relations from laws of thermodynamics and explain its significance. [6M]

3(a) Explain the terms average speed, most probable speed, mean free path rms velocity. [6M]

(b) A cylinder of volume 0.08 m³ contains oxygen gas at a temperature of 280 K and pressure of 90 kPa. Determine i) mass of oxygen in the cylinder ii) number of oxygen molecules in the cylinder iii) RMS speed of oxygen molecules [6M]

(OR)

4(a) Sate the assumptions for the molecular model of an ideal gas. [6M]

(b) A vessel contains an ideal diatomic gas at temperature of 20 °C. The total translational kinetic energy of the gas molecule is 3 x 10⁻⁶ J. The mass of the gas is then doubled and the total translational kinetic energy of the gas molecules becomes 9 x 10⁻⁶ J. Determine the new temperature of the gas. [6M]

5(a) What is the difference between the universal & characteristic gas constant? Develop the expressions for change in internal energy and enthalpy of non reactive mixtures. [6M]

(b) A Gaseous mixture consists of 1 kg of oxygen and 2 Kg of nitrogen at a pressure of 150 KPa and a temperature of 20 °C. Determine the changes in internal energy, enthalpy and entropy of the mixture when the mixture is heated to a temperature of 100 °C at constant volume. [6M]

(OR)

6(a) Define heating value of fuel. What is the difference between higher heating value (HHV) and lower heating value (LHV) of the fuel? [6M]

(b) Determine the enthalpy of combustion gaseous phase C_3H_8 at 25 °C and 1 atm. [6M]

7(a) Formulate the availability function expression for open system. [6M]

(b) In a steam boiler, hot gases from a fire transfer heat to water which vaporizes at constant temperature. In a certain case, the gases are cooled from 1100 °C to 550 °C while the water evaporates at 220 °C is 1858.5 KJ/Kg. All the heat transferred from the gases goes to the water. How much does the total entropy of the combined system of gas and water increase as a result of the irreversible heat transfer? Obtain the result on the basis of 1 kg of water evaporated. If the temperature of surroundings is 30°C, find the increase in unavailable energy due to irreversible heat transfer. [6M]

(OR)

8(a) Deduce the expressions for Irreversibility of closed and open systems. [6M]

(b) Air expands through a turbine from 500 kPa , 520 °C to 100 kPa, 300 °C. During expansion 10 kJ/kg of heat is lost to the surroundings which is at 98 kPa , 20 °C. Neglecting the KE & PE changes, Determine per kg of air i) Decrease in availability ii) Maximum work iii) Irreversibility. [6M]

9. In a combined GT-ST cycle power plant, the exhaust gas from the GT is the supply gas to the steam generator at which a further supply of fuel is burned in the gas. The pressure ratio for the GT is 8.Inlet air temperature is 15 °C and the maximum cycle temperature is 800 °C.

Combustion in the steam generator raises the gas temperature to 800 °C and the gas leaves the generator at 100 °C. The steam condition at supply is at 60 bar & 600 °C and the condenser pressure is 0.05 bar. Calculate the flow rates of air and steam required for a total power output of 190 MW and the overall efficiency of the combined plant. What would be the F/A ratio? Take C_{pg}=1.11 & C_{pa}=1.005kJ/kg K, γ_g=1.33 & γ_a= 1.4 and Calorific value of fuel is 43.3 MJ/kg. Neglect the effect of fuel flow on the total mass flow of gas expanding in the GT. [12M]

(OR)

10(a) Compare and contrast the second law (exergy) from first law (energy). [6M]

(b) Derive the expression for second law analysis of gas power cycles. [6M]

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