CODE : 13CS1103

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. First Semester

OBJECT ORIENTED ANALYSIS AND DESIGN

(Computer Science & Engineering)

Time : 3 hours Max. Marks : 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 (a) Explain Class Hierarchy and Polymorphism

(b) Explain Object Relationships and Associations

2 Explain a) Object and Identity b) Static and Dynamic Binding
c) Object Persistence d) Meta-Classes

SECTION – II

3 Write in detail about Patterns and Framework.

4 Explain in detail about UML class diagram.

SECTION - III

5 (a) Why analysis is a difficult activity?

(b) Explain Business object analysis and Use-Case driven object oriented analysis.

6 Explain the following with examples
a) Associations b) Super-sub class relationships.

SECTION - IV

7 Write in detail about Designing classes with example.

8 Explain in detail about the Access Layer.

SECTION - V

9 (a) Discuss the Impact of Object Orientation on Testing.

(b) Explain Test cases and Test Plan.

10 Explain Continuous Testing and Myer's Debugging Principles.

CODE : 13EC1103

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. First Semester

EMBEDDED SYSTEM CONCEPTS

(Digital Electronics and Communication Systems)

Time : 3 hours Max. Marks : 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION – I

1 (a) Explain briefly about hardware units of embedded systems.
(b) Explain the classifications of embedded systems.

2 (a) Discuss the need for software in embedded system.
(b) Differentiate General Purpose Processors and DSP.

SECTION – II

3 (a) Explain the features of component interfacing.
(b) Explain the network for embedded systems.

4 Write sort notes on
I. RS 422 II. IEEE 488 bus

SECTION – III

5 Explain the following
I. Message Queues & Pipes II. Interrupt Service Routing

6 Compare all the software architectures of embedded systems with one example for each.

SECTION – IV

7 What is design methodology? Explain the different types of design methodologies.

8 (a) Explain the use of software tools for development of an embedded system.
(b) What is mean by host? Explain the use of host in an embedded system.

SECTION – V

9 (a) Explain briefly about different data operations in an ARM processor.
(b) Differentiate the SHARC processor and ARM processor.

10 Explain the design process of the following
I. Personal Digital Assistants II. Ink-Jet Printer.

Code: 13PS1102

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

HVDC & FACTS
(Power Systems)

Time: 3 hours Max. Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks
<* * *>

SECTION – I

1. a) What are the different advantages of DC transmission system? Explain them in detail.
   b) With help of neat sketches, analyze a six pulse rectifier bridge circuit with an overlap angle greater than 60^0.

2. a) Obtain the expression for the output voltage and direct current of a converter working as a rectifier with delay angle α and commutation angle μ.
   b) Explain modern trends in DC transmission.

SECTION – II

3. a) With block diagram explain the principle of operation of DC link control.
   b) State the advantages and disadvantages of IPC schemes used for firing angle control of converters. Explain the operation of cosine control of phase delay used in the above scheme.

4. a) Explain in detail about the extinction angle control. What are the limitations under asymmetrical fault?
   b) Explain the role of phased locked oscillator used in pulse phase control. Why EPC scheme is used in modern HVDC stations?

SECTION – III

5. a) Explain in detail, the concepts of Reactive power requirements in HVDC converters.
   b) Why harmonics are generated in power systems? What are their harmful effects? How can they be removed from the systems?

6. a) What are the various sources of reactive power in power system? Explain the necessity of compensating reactive power. List out relative advantages and disadvantages of

each source of reactive power.

b) How do harmonics arise in power systems? Describe various filters used for controlling harmonics.

SECTION – IV

7. **a)** Explain how FACTS devices help in controlling power flows.
   b) Explain in detail principle of working of static VAr compensator (SVC).

8. a) Compare the performance and advantages of SVC and STATCOM.
   b) Describe briefly various types of FACTS controllers available.

SECTION – V

9. a) Describe the principle of operation of thyrsistor controlled series capacitor (TCSC) with suitable waveforms and also explain V-I characteristics.
   b) Describe the capabilities of series compensation in improving transient stability, power oscillation damping and voltage stability.

10. a) Explain unified power flow control and discuss how it is more versatile than other FACTS devices.
    b) Describe control schemes of SSSC (Static series compensator)

Code : 13MME103

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M. Tech. I Semester

ADVANCED MANUFACTURING PROCESSES
(Advanced Manufacturing Systems)

Time:3hrs Max.Marks:60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

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SECTION - I

1 (a) Distinguish AJM &AWJM
(b) Discuss the factors affecting material rate of AJM.

2 (a) Discuss Ultrasonic machining process, state the requirement of abrasive grit employed.
(b) With neat sketch explain the working principle of water jet machining

SECTION - II

3 (a) Describe the chemistry involved in the ECM
(b) Discuss the requirements of electrolytes of ECM.
4 (a) Explain the working principle of RC type EDM process with neat sketch.
(b) Describe material removal mechanism in EDM

SECTION - III

5 (a) Classify lasers employed in machining, and describe LBM process.
(b) Compare transferred and non transferred type of PAM process

6 (a) Describe ,with help of a sketch, electron beam machining process
(b) Compare laser beam machining and electron beam machining

SECTION - IV

7 (a) What are Micro system products and Applications?
(b) Explain the LIGA process

8 (a) What is fullerene, and significance of carbon nano tubes
(b) Explain bottom up &top down nano Fabrication Processes.

SECTION - V

9 (a) Discuss the processing of ceramic components.
(b) List the major types of ceramics that are useful in engineering applications

10 (a) Distinguish between composites and alloys.
(b) Compare the advantages and disadvantages of MMC,CMC and reinforced plastics

Code :13PS1101

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

COMPUTER METHODS IN POWER SYSTEMS

(Power Systems)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

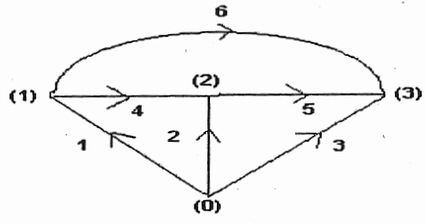
* * *

SECTION - I

1 Define the following terms with a suitable example
i) Graph, oriented graph,
ii) tree, co-tree,
iii) cut-set, basic cut-set
iv) loop, Basic loops
v) What is the relation between basic loop and link and basic-cut-set and the number of branches

2 a) Derive the expression for Loop admittance and impedance matrices by non singular transformation

b) Fig. Shows a six element graph of a power system network. Each element reactance is j0.1p.u. Formulate Y_{bus}, using the singular transformation method.



SECTION - II

3 a) Four bus system having reference node'4', comprises the line impedances in pu as follows: $Z_{14} = j1.0$, $Z_{12} = j0.2$, $Z_{24} = j1.25$, $Z_{23} = j0.05$.
Find Z_{bus} for the system by the Z_{bus} building algorithm.

b) What are the features and merits of admittance matrix over the impedance matrix in solving the power system problems

4 Describe the algorithm for formation of bus impedance matrix for addition of a link.

SECTION - III

5 Find the sequence impedance matrix of an element whose phase impedance matrix is:

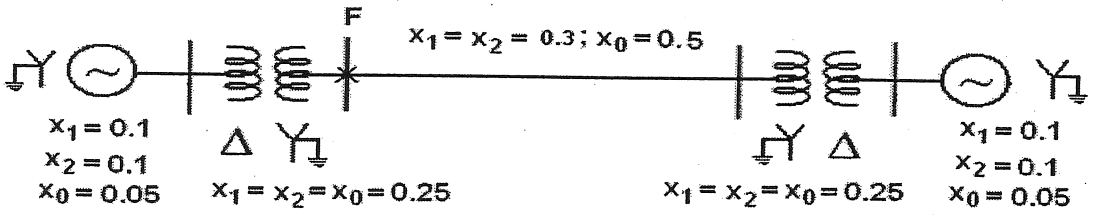
$$\left[z_{pq}^{abc}\right] = \begin{bmatrix} j0.6 & j0.2 & j0.1 \\ j0.1 & j0.7 & j0.4 \\ j0.2 & j0.3 & j0.8 \end{bmatrix}$$

6 Explain the algorithm for formation of three phase bus impedance matrix for addition of branch

SECTION - IV

7 Derive the following equation $\frac{\sqrt{3}}{Zpp^{(0)}+Zpp^{(1)}+Zpp^{(2)}+3Z_f}\begin{bmatrix}1\\1\\1\end{bmatrix}|V_a|$

8 Determine the fault current. Using Z_{bus} Building Algorithm for the system shown in Figure. A LLG fault occurs at point F.



SECTION - V

9 A3-Bus power system with generation at Bus-1 (slack bus).$V_1 = 1.05\angle 0^0$, $Y_{12} = 10\text{-}j20$, $Y_{13} = 10\text{-}j30$ p.u., $Y_{23} = 16\text{-}j32$ p.u., $Y_{22} = Y_{12} + Y_{23}$, $Y_{33} = Y_{13} + Y_{23}$ with $P_2 = -1.566$ p.u., $Q_2 = -1.162$ p.u., $P_3 = -1.4$ p.u. and $Q_3 = -0.5$ p.u. Using GS-method.
Determine the voltages at load buses 2 and 3 after two iterations.

10 a) State the assumptions made in load flow studies. Classify the various types of buses and explain the necessity of load flow studies,

b) Derive the static load flow equations in both polar and rectangular coordinates

Code: 3EC1102

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014
M.Tech. First Semester

ADVANCED DIGITAL SIGNAL PROCESSING
(Digital Electronics and Communication Systems)

Time: 3Hours Max Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION – I

1. a) State and prove the following theorems of Discrete-time Fourier Transform.
(i) Time shifting (ii) Frequency shifting

b) Determine the inverse discrete-time Fourier transform of the following.

(i) $H(e^{jw}) = 1 + 2\cos w + 3\cos 2w$ (ii) $Y(e^{jw}) = \frac{1}{2}\{X(e^{jw/2}) + X(e^{-jw/2})\}$

2. a) Derive the expressions for the frequency response of LTI FIR and IIR discrete time systems.

b) Explain Gibbs phenomenon.

SECTION – II

3. a) Explain the classification of digital filter transfer functions based on magnitude characteristics.

b) Explain the importance of linear phase property for a digital filter transfer function.

4. Write about the following complementary transfer functions
(i) Delay-complementary transfer functions
(ii) Power complementary transfer functions
(iii) Doubly- complementary transfer functions

SECTION – III

5. Realize the IIR transfer function H(z) given below

$$H(z) = \frac{0.2545(1+z^{-1})(1+0.6985z^{-1}+z^{-2})}{(1-0.169z^{-1})(1+0.0278z^{-1}+0.725z^{-2})}$$

in the following forms; (i) Direct canonic form (ii) Cascade form (iii) Gray – Markel form. Compare their hardware requirements.

6. a) What are the two major issues in designing of digital filter transfer function. Explain briefly.

b) Explain the procedure to design digital IIR filters using Pade's approximation.

SECTION – IV

7. a) Discuss clearly about frequency transformation using DFT and IDFT pair and bring out the computational complexity involved. Determine the order of computations required and suggest methods to reduce it.

   b) Find X(K) for the given sequence x(n) = {1,2,3,4,4,3,2,1}using DIT-FFT Algorithm.

8. What is the limitation of DIT and DIF algorithms used to compute DFT, if the sequence length 'N' is not a power of 2. What is Index Mapping approach. Explain fast DFT algorithm based on Index mapping.

SECTION – V

9. a) What are the issues in spectral estimation? What is the effect of these issues on the spectral characteristics in practice?

   b) Distinguish clearly the role of Auto correlation on power spectrum estimation and hence give expressions for Bias and variance in case of periodogram technique using Barlett Method.

10. a) What are the advantages of power spectral estimation using model parameters and describe different methods in modeling data. Compute them.

    b) Obtain the relation between Auto correlation coefficients and the model parameters in AR model estimation and explain the Yule-waker method of power spectral estimation. Discuss about Bias and variance.

Code : 13MME102

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

ADVANCED MATERIAL TECHNOLOGY

(Advanced Manufacturing Systems)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION – I

1 (a).Explain rheology of polymers and deformation of polymers.
(b).Briefly explain relaxation and relaxation time for viscoelastic materials.

2 (a).Differentiate precipitation and dispersive strengthening.
(b).Draw a stress-strain curve as increasing the temperature and also explain from this curve the type of fracture for metals.

SECTION – II

3 (a) Briefly explain structural changes occurred during creep
(b) Draw creep curves for low alloy steel at different temperatures at constant tensile stress.

4 (a) what are the important factors to be taken in to account while designing a creep resistant alloy.
(b) Explain critical stress intensity factor and Methods of prevention against fracture

SECTION – III

5 (a) Briefly explain factors affecting fatigue life and methods of increasing fatigue life.
(b) Explain the effect of stress concentration on fatigue.

6 Explain the process of crack initiation, propagation and fracture during cyclic loading.

SECTION – IV

7 (a) Briefly explain corrosion fatigue and hydrogen embrittlement.
(b) What are the factors to be considered in order to make a judicious selection of materials of specific applications.

8 What are the various factors to be considered in the selection of materials for the following?
(a) Pressure vessels and super heaters (b) Turbine blades for power plant (c) Tool material for welding of structurals of Aero applications

SECTION – V

9 what is super alloy and explain broad classification of super alloy.

10 (a) Explain about High strength low alloy steels and TRIP steels.
(b) Briefly explain applications of advanced ceramics viz., MEMS and optical fibres.

Code : 13CS1102

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester (Computer Science and Engineering)

ADVANCED COMPUTER ARCHITECTURE

Time : 3 hours

Max. Marks : 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

SECTION – I

1 Machine M runs at 3 GHz. When running program P, its CPI= 1.5.

(a) How many instructions will be executed during 1 second while P is running?

(b) While running program P, the mouse has to be polled 30 times per second. The polling routine requires executing 200 instructions with a CPI of 2. What is the overhead, that is, the fraction of time used in polling the mouse? Is it significant?

2 A. Assume that an interrupt is detected at time t. One of the instructions currently in the pipeline at time t generates an exception before its completion. How would you solve this problem?

B. Explain the Paging systems of Virtual Memory Management.

SECTION – II

3 A Explain the role of Reservation Stations in Detail.

B Why there is no check for a WAR dependency in an in-order Alpha 21164 processor.

4 In the P6 microarchitecture, instructions of the form R1←R2+ Mem [R3] are translated into two μ ops at decode time: one for the load with a temporary register as result, and one for the addition. AMD processors with the same ISA consider the instruction as a single macro-op that is issued twice, once to a load unit and once to an integer unit. Are there some advantages to the AMD implementation? If so, what are they?

SECTION – III

5 Explain Decoding and Register Renaming for DEC Alpha 21264

6 In the discussion of the wakeup–select steps we have assumed that the execution units have a latency of 1 so that a result tag could be broadcast in the same cycle as the selection. How would you modify the entries in the reservation stations so that other latencies can be considered? You can assume that the latency of a given operation is known during the decode stage.

SECTION – IV

7 A. Explain different ways to improve access to L1 Caches.

B. Is page coloring adequate for L1 or for L2 caches? Discuss the various options.

8 What simplifications occur in the full directory protocol if the system uses a centralized memory, that is, a UMA architecture rather than a NUMA one?

SECTION – V

9 Draw the block diagram of IBM Cell Multiprocessor and highlight its superiority over other multiprocessors came just prior to it.

10 What is triggering? Write about two main techniques that can be used when triggering step has been detected.

Code: 13PS1103

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

POWER SYSTEM OPERATION & CONTROL

(Power Systems)

Time: 3 hours Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION - I

1 a Explain the system behavior in the view of load frequency analysis.

b Evaluate the uncontrolled two- area static response with relevant expressions.

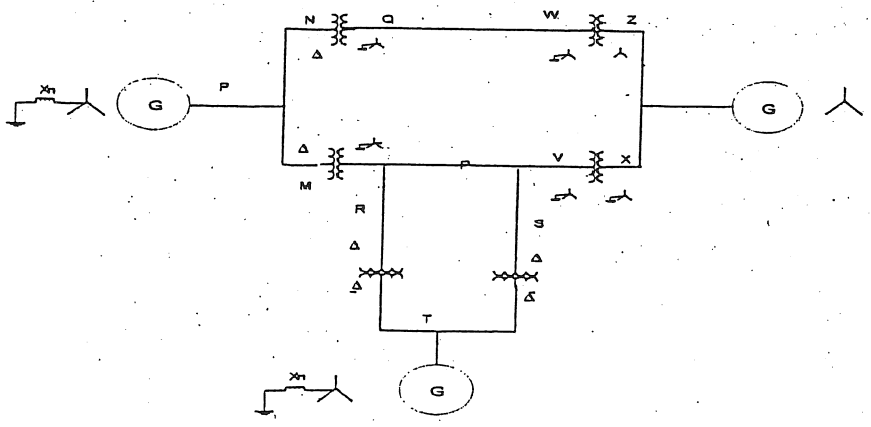
2 A 100 MVA synchronous generator operates on full load frequency of 50 Hz. The load is suddenly reduced to 50 MW. Due to time lag in governor system, the steam valve being to close after 0.4 Sec, determines the change in frequency that occurs in this time.

SECTION – II

3 a Obtain the symmetrical components for the set of unbalanced voltages
$V_a = 300\angle -120^o, V_b = 200\angle 90^o$ & $V_c = 100\angle -30^o$

b The symmetrical components of a set of unbalanced three phase currents are $I_a^o = 3\angle -30^o$, $I_a^1 = 5\angle 90^o$ & $I_a^2 = 4\angle 30^o$. Obtain the original unbalanced phasors.

4 Draw the Zero sequence diagram for the system whose one line diagram is shown in figure.

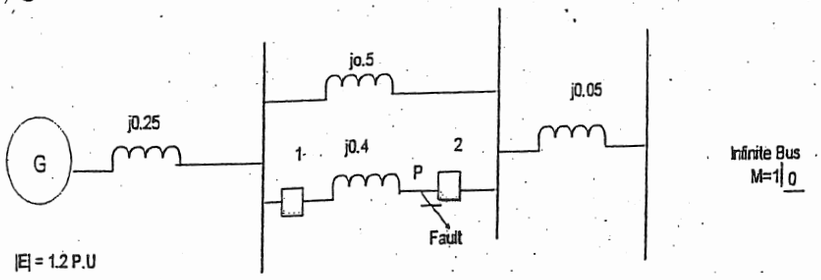


SECTION - III

5 Explain the modified Euler method of analyzing multi machine power system for stability with a neat flow chart.

6 Find the critical clearing angle for clearing the fault with simultaneous opening of the breakers 1 and 2. The reactance values of various components

are indicated on the diagram. The generator is delivering 1.0 p.u. power at the instant preceding the fault. The fault occurs at point P as shown in the figure.



SECTION - IV

7 Discuss in detail about the equality and inequality constraints when the transmission losses are ignored.

8 a Derive the expression for objective function when the transmission losses are ignored.

b The fuel cost of two generators is given by.

$C_1=0.1P_{G1}^2+20P_{G1}+1.5$ Rs./hr

$C_2=0.1P_{G2}^2+30P_{G2}+1.9$ Rs./hr

The real power generation of units P_{G1} and P_{G2} are in MW. Determine the most economical load sharing between the generators, when the total demand on the system is 200MW.

SECTION - V

9 Describe the types of hydro-thermal co-ordination?

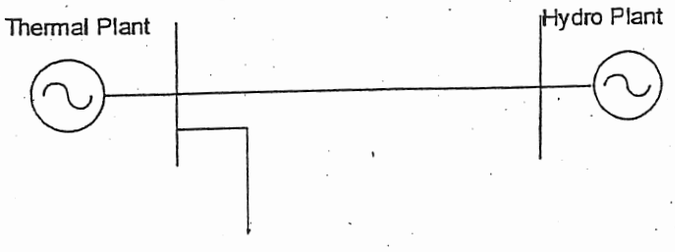
10 A two plant system having a steam plant near the load center and a hydro plant at a remote location is shown in Fig. The load is 500MW for 16 hr a day and 350 MW, for 8 hr a day. The characteristics of the units are

$C_1 = 120+45P_{GT} + 0.075\ P_{GT}^2$

$w_2=0.6P_{GH}+0.00283P_{GH}^2$ m^3/s

Loss coefficient, $B_{22}=0.001MW^{-1}$

Find the generation schedule, daily water used by the hydro plant, and daily operating cost of the thermal plant for γ_j=85.5 Rs./m^3-hr



Typical two-plant hydro-thermal system

CODE : 13EC1104

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. First Semester

CODING THEORY & TECHNIQUES

(Digital Electronics and Communication Systems)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 a) Prove that i) H(X<Y) = H(X) – H(X/Y) ii) H(Y) – H(Y/X)

b) State and explain Shannon-Fano algorithm with example?

2 a) Find the coding efficiency of a transmitter emits messages with probability is 0.36,0.14,0.13,0.12,0.10,0.09,0.04,0.02 using Haffman coding.

b) Explain about the Lempel-Ziv algorithm?

SECTION - II

3 Design a linear block code with a minimum distance of three and a message block of 4 bits.

4 The parity check bits of a (8,4) block code are generated by

C5 = d1+d2+d4

C6 = d1+d2+d3

C7 = d1+d3+d4

C8 = d2+d3+d4

Where d1,d2,d3,d4 are the message digits

i) Find the generator matrix and parity check matrix for this code
ii) Find the minimum weight of this code
iii) Find the error detection capabilities of this code.

SECTION - III

5 Explain about Hamming codes and perfect codes with an example.

6 Based on the Mac-Williams identity, the weight enumerated B(z) of the dual code C_D is expressed in terms of the weighted enumerator A(z) of the code C by $B(z) = 2^k(1+z)^n A\left(\frac{1-z}{1+z}\right)$. Derive A(z) in terms of B(z)

SECTION - IV

7 Design a (2,1,3) convolution feed back sequential decoder for a receiver vector R= 1100010001.

8 Design a trellies diagram for a received vector Z= 1101011001, and find the received vector?

SECTION - V

9 Design (7,3) BCH decoder for a receiving vector at receiver is R = 100001101111010110111.

10 Design a (2,1,3) Viterbi decoding for a received vector Z= 1101011001.

Code : 13CS1104

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

ADVANCED DATABASE MANAGEMENT SYSTEMS
(Computer Science & Engineering)

Time : 3 hours

Max. Marks 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 a. What is a database schema? Explain with a suitable example.

b. What is meant by data independence? Explain the different types of data independence. How do we achieve data independence?

2 a Explain with an example the three-schema architecture and explain the different mappings among the three levels.

b What are the different components of an ER diagram? Write an ER diagram for any college administration.

SECTION - II

3 a Define Functional Dependency. Give an Example

b What is the need of normalization? Explain 3rd Normal Form with a suitable example.

4 a What do you mean by Join Dependency? Explain Project-Join Normal Form

b What is meant by MVD? Explain 4NF in detail

SECTION - III

5 a Explain the terms integrity and referential integrity

b Explain how Object Database design differs from Relational Database design

6 Discuss Object Relational Features of Oracle 8

SECTION - IV

7 a Explain the main control measures to be taken for data in databases.

b Differentiate between information security and information privacy

8 a Explain in detail Mandatory based access control and Role based access control for multi-level security

b Explain the different spatial data types and models.

SECTION - V

9 a Explain the various GIS data models.

b What are the features of Genome Data. Write short notes on some existing Biological databases.

10 a Explain the different components involves in GIS system

Code : 13MME104

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

DESIGN FOR MANUFACTURING AND ASSEMBLY
(Advanced Manufacturing Systems)

Time : 3 hours MaxMarks60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks
* * *

SECTION - I

1 a Explain the general design rules for Manufacturability.

b Elucidate the Material selection interrelationship with process selection.

2 a Explain the importance of creativity in design

b What are the various phases of Asimov's morphology of design?

SECTION - II

3 Explain briefly the basic principle involved in various casting processes with neat sketches.

4 a What are the criteria for selecting the machining parameters for drilling operation?

b Define Machinability and Explain the various factors responsible for improving Machinability.

SECTION - III

5 a What are the various factors involved in design of weldments?

b Explain the effect of pre and post treatment of welds on a weld joint.

6 a Explain the general design considerations for drop forging design?

b Explain the design principles involved in Blanking?

SECTION - IV

7 a What are the criteria involved in the choice of assembly method?

b Discuss the constructional features of a transfer machine.

8 a What are the various Indexing mechanisms in automatic assembly transfer systems?

b What are the advantages of assembly?

SECTION - V

9 a What are the methods developed for the systematic DFA analysis?

b Explain the effect of part thickness & size handling time with a suitable example.

10 a What are the benefits of applying the design for assembly fits in the design Process?

b Describe classification system for manual insertion and fastening.

Code : 13MME1E2

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

ADVANCED CAD
(Advanced Manufacturing System)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 (a) Discuss the benefits of CAD/CAM to engineering designs compared to conventional methods?

(b) What are the different types of computer systems that can be used for CAD/CAM applications? Briefly explain any one of them.

2 (a) Explain the functional areas of basic CAD system and their applications in the design process?

(b) Briefly explain various computer peripheral devices used for CAD/CAM applications?

SECTION - II

3 (a) Briefly explain advantages and disadvantages of wireframe modeling?

(b) Discuss any three wireframe entities?

4 (a) Explain why parametric representations have proved popular in computational geometry?

(b) Write short notes on Bezier curves?

SECTION - III

5 (a) Distinguish between wireframe and surface modeling?

(b) What do you mean by surface entity? explain.

6 Explain the following in context to the surface modeling
i)Surface of revolution ii)Tabulated surface iii)Coons patch

SECTION - IV

7 Discuss about Hermite Bi-Cubic surface and Bezier surface?

8 Explain the following transformation
i) Reflection ii) Shear iii) 3-D Rotation iv) 3-D Transformation

SECTION - V

9 Explain in detail the importance of Solid modeling and what measures do you take before constructing a solid geometry?

10 (a) Describe the structure of an IGES file?

(b) Discuss various graphic standards?

Code :13CS11E3

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

ADVANCED OPERATING SYSTEMS
(Computer Science & Engineering)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks
* * *

SECTION - I

1 What is a Distributed System? Discuss briefly hardware concepts with example?

2 Explain in detail about Layered Protocols.

SECTION - II

3 Discuss the role of clocks in Distributed Systems. List out and explain supporting algorithms.

4 Write in detail about Process Allocation in Distributed Systems.

SECTION - III

5 What is a real time system? Discuss briefly scheduling in RTDS with example?

6 Explain about Caching and Replication in Distributed File Systems.

SECTION – IV

7 What is a Consistency Model? Discuss Paged based DSM with example?

8 Write about Process Management in AMOEBA with example?

SECTION - V

9 Discuss the role of process management in MACH operating system?

10 Explain about Remote Procedure Call in DCE.

CODE: 13EC11E2

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. First Semester

LOW POWER VLSI DESIGN

(Digital Electronics and Communication Systems)

Time : 3 hours Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION - I

1 Explain about Low cost medium speed 5V Digital BiCMOS process with neat diagram.

2 Briefly explain about

(i) shallow trench isolation (ii) Deep trench isolation

SECTION – II

3 What are the various power dissipation mechanisms in CMOS circuits & explain in detail.

4 Explain about low power design approaches through voltage scaling.

SECTION – III

5 (i) What are the basic driver configurations in BiCMOS & explain one in detail

(ii) Draw & explain the operation of BiCMOS NAND gate.

6 Draw and explain operation of

(i) CMOS AND OR INVERT gate (ii) FS-CMBL NAND gate with feedback

SECTION – IV

7 Explain the operation of carry look ahead adder with neat diagram.

8 Explain the operation of 4 bit ripple carry adder.

SECTION – V

9 (i) Explain the read and write operation of DRAM Cell.

(ii) Write the difference between SRAM and DRAM memory.

10 Explain the operation of Wallace tree multiplier.

Code :13PS11E1

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

ELECTRICAL DISTRIBUTION SYSTEMS

(Power Systems)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 (a) Explain load modeling and its characteristics

(b) Write in detail about commercial and agricultural loads and their respective characteristics.

2 Explain in brief coincidence factor, loss factor and give the relation between loss factor and load factor.

SECTION - II

3 (a) Explain with neat sketches radial type and loop type sub transmission systems.

(b) What are the various factors that influence the voltage levels in the design and operation of the distribution system? Explain

4 (a) With neat sketches explain the various types of subtransmission systems.

(b) How the rating of distribution substation can be calculated. Explain taking a general case with 'n' no. of feeders.

SECTION - III

5 (a) Derive an expression for voltage drop and power loss for uniformly radial type distribution load.

(b) Derive an expression for voltage drop in a three phase ac distributor

6 A 3 phase distribution line has resistance and reactance per phase of 10 ohm and 25 ohms respectively. If the sending end voltage is 33 Kv and regulation of the line is not to exceed 10 %. Find the maximum power in Kw which can be transmitted over the line. Find also the KVAR supplied by the line when delivering the maximum power.

SECTION - IV

7 (a) What are the different types of common faults that occur in a distribution system? Explain them with proper line diagram.

(b) Explain the principle of operation of fuses.

8 The per unit positive, negative and zero sequence impedances of a distributed network are 0.06, 0.06 and 0.04 respectively. Determine the fault current for L-L and L-G faults.

SECTION - V

9 (a) What are the effects of shunt and series capacitors in distributions systems

(b) Briefly explain about line drop compensation

10 (a) How an AVR can control voltage? With the aid of suitable diagram explain its function.

(b) A 3-phase,50Hz, 2200V induction motor develops 400H.P at a power factor 0.85lag and efficiency 90% .The power factor is to be raised to unity by connecting a bank of condensers in delta across supply mains. If each of the capacitance unit built up of 4 similar 550V condensers, calculate the required capacitance of each condenser and its KVA rating.

Code : 13MME105

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

OPTIMIZATION TECHNIQUES IN ENGINEERING

(Advanced Manufacturing Systems)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION – I

1 a) What are the different ways of classification of Optimization problems?

b) The daily demand for loaves of a bread at a grocery store are specified by the following probability distribution:

n	100	150	200	250	300
p_n	0.20	0.25	0.30	0.15	0.10

The store pays Rs.5.5 a loaf and sells it for Rs.12 each. Any loaves that are not sold by the end of the day are disposed of at Rs.2.5 each. Assume that the stock level is restricted to one of the demand levels specified for p_n.

Develop the assumed decision tree and find the number of loaves to be stocked daily.

2 a) What is a decision tree? Explain with an example.

b) The research department of a company has recommended to the marketing department to launch a shampoo of three different types. The marketing manager has to decide one of the types of shampoo to be launched under the following estimated pay off's for various levels of sales.

Types of shampoo	Estimated level of sales (units)		
	15000	10000	5000
Regular shampoo	30	10	10
Clinic shampoo	40	15	5
Deluxe shampoo	55	20	3

What will be the marketing manager's decision if the following criterion are applied ?

a) Maximin criterion (b) Hurwicz criterion, the degree of optimization being 0.7 (c) Laplace criterion and (d) Regret criterion.

SECTION – II

3 Solve the following LPP by revised SIMPLEX method:

Minimize: $Z = 2x_1 + x_2$

Sub. to: $3x_1 + x_2 = 3$

$4x_1 + 3x_2 \geq 6$

$x_1 + 2x_2 \leq 3$

and $x_1, x_2 \geq 0$

4 Solve the following LPP by the principle of Duality:
Minimize: $Z = 6x_1 + 3x_2$
Sub. to: $6x_1 - 3x_2 + x_3 \geq 2$
$3x_1 + 4x_2 + x_3 \geq 5$
and $x_1, x_2, x_3 \geq 0$

SECTION – III

5 Solve the following NLPP by Lagrange's multiplier method:
Maximize: $f(x_1,x_2) = \pi x_1^2 x_2$
Subject to : $2\pi x_1^2 + 2\pi x_1 x_2 = 24\pi$
and $x_1, x_2 \geq 0$

6 Apply Wolfe's method for solving the quadratic programming problem
Maximize: $Z = 4x_1 + 6x_2 - 2x_1^2 - 2x_1x_2 - 2x_2^2$
Subject to: $x_1 + 2x_2 \leq 2$
and $x_1, x_2 \geq 0$

SECTION - IV

7 Solve the following MIP by Gomory's method
Maximize $Z = 3x_1 + 4x_2$
Subject to: $3x_1 - x_2 \leq 12$
$3x_1 + 11x_2 \leq 66$
$x_1 \geq 0$
$x_2 \geq 0$ and integer.

8 Solve by Land and Doig's B & B algorithm:
Minimize: $Z = x_1 - 3x_2$
Subject to: $x_1 + x_2 \leq 5$
$-2x_1 + 4x_2 \leq 11$
$x_1, x_2 \geq 0$ and integer.

SECTION - V

9 A 4-ton vessel is loaded with one or more of three items. The following table gives the unit weight, w_i, in tons and the unit revenue, r_i, in thousands of rupees per item i. How should the vessel be loaded to maximize the total return?

Item i	w_i	r_i
1	2	31
2	3	47
3	1	14

10 Name two shortest route algorithms and explain them.

Code : 13CS1105

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

CRYPTOGRAPHY & NETWORK SECURITY

(Computer Science & Engineering)

Time : 3 hours Max. Marks : 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 Explain about Network Security model with its neat diagram.

2 Explain in detail about Data Encryption Standard (DES).

SECTION - II

3 Explain Diffie-Hellman Key exchange algorithm with its merits and demerits.

4 Explain about Fermat's and Euler's theorem.

SECTION - III

5 Write short notes on

i) Message Authentication Code (MAC) ii) Hash Functions

6 Explain the details of the digital signature algorithm along with its proof.

SECTION - IV

7 Write about X.509 Authentication service.

8 Write short notes on

i) ESP Format ii) Web Security Threats

SECTION - V

9 Write short notes on

i) Intruders ii) Viruses

10 Explain the various types of Firewalls.

CODE : 13EC1105

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. First Semester

TRANSFORM TECHNIQUES

(Digital Electronics and Communication Systems)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 (a) A speech signal has a maximum frequency (also called bandwidth) of 4 kHz. We want to digitize it and send it in a file using 2 bytes (i.e., 16 bits) per sample. What would be the minimum length of the file occupied by the signal for each minute of recording? Assume the signal is not compressed.

(b) Consider a sinusoidal signal $x(t) = 3 \cos (1000\pi t + 0.1 \pi)$ that is sampled at a frequency $F_s = 2$ kHz.

a. Determine an expression for the sampled sequence $x[n] = x(nT_s)$, and determine its discrete time Fourier transform $X(\omega) = DTFT\{x[n]\}$.
b. Determine $X(F) = FT\{x(t)\}$.
c. Recompute $X(\omega)$ from the $X(F)$, and verify that you obtain the same expression as in (a).

2 (a) A continuous time signal x(t) has a bandwidth $F_B = 10$ kHz and it is sampled at Fs = 22 kHz, using 8-bits/sample. The signal is properly scaled so that $|x[n]| < 128$ for all n.

a. Determine a best estimate of the variance of the quantization error, σ_e^2.
b. If the sampling rate was increased by 16 times, how many bits per samples would you use in order to maintain the same level of quantization error?

(b) A real signal x(t) is sampled at 8 kHz, and 256 samples, x[0],...,x[255], are stored. The magnitude of the DFT X[k] has two sharp peaks at k = 15 and k = 241. What can you say about the signal?

SECTION – II

3 (a) List properties of wavelets used in continuous wavelet transform.

(b) Compute the time-bandwidth product for the spectrogram of $x(t) = \exp(j\omega_0 t)$, computed with the window function W(t). The answer should be in terms of W(t) and ω_0.

4 (a) Bring out the importance of the windowed Fourier transform.

(b) Explain about the uncertainty principle and frequency tiling.

SECTION – III

5 (a) Sketch the Haar father and mother wavelet families for three different scales, j = 0, 1, 2 for a period of 2 seconds.

(b) Given the 4-tap Daubechies wavelet coefficients, $h_0(k) = [0.483 \quad 0.837 \quad 0.224 \quad -0.129]$. Determine $h_1(k)$ and plot magnitude frequency responses for both $h_0(k)$ and $h_1(k)$.

6 (a) Differentiate between decimation and interpolation in time and frequency domains.

(b) Justify the statement: Two-stage decimation can dramatically reduce the anti-aliasing filter length.

SECTION – IV

7 (a) Given the sample values [8 -2 4 1], use the Haar wavelet to determine the level-2 wavelet coefficients.

(b) The four-level DWT coefficients are given as follows;
W = [100 20 16 -5 -3 4 2 -6 4 6 1 2 -3 0 2 -1]. List the wavelet coefficients to achieve each of the following compression ratios: (i) 2:1 (ii) 16:1.

8 (a) Write note on multidimensional wavelets.

(b) Explain in detail about lifting scheme of wavelet generation.

SECTION - V

9 Perfect reconstruction conditions for the two-band case are derived to design the analysis and synthesis filters. Justify with examples.

10 Write in detail how important wavelet transforms are, in sub-band coding of speech signals.

Code : 13PS1104

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

POWER QUALITY

(Power Systems)

Time : 3 hours Max. Marks : 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 a) Define Power Quality. With neat diagrams, explain the different terms used in power quality.

b) Write a short note on Cost of Interruption.

2 a) Define Long interruption. How do you differentiate between failure, outage and interruption?

b) Discuss the comparison of observations and reliability evaluation.

SECTION - II

3 a) Write about short interruptions.

b) Differentiate between long interruption and short interruptions of the power system networks

4 a) Explain about single phase tripping.

b) Explain the stochastic prediction of short interruptions.

SECTION - III

5 a) Give in detail about the sources and causes of voltage sags.

b) Draw the flow chart for analysis of voltage sags.

6 Write about magnitude and phase angle jumps for three phase unbalanced sags.

SECTION - IV

7 a) Using block diagram approach, discuss the operation of A.C and D.C. drives.

b) Explain the effects of sag on adjustable speed drives?

(P.T.O.)

8 Under what circumstances the adjustable speed drive will trip. Discuss the reasons in detail

SECTION - V

9 a) Explain the Method of fault positions

b) Explain the Method of Critical Distances

10 Explain the following in brief:

i. Voltage Sag Coordination Chart

ii. Monitoring of Power Quality

Code : 13CS1101

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014

M.Tech. I Semester

ADVANCED DATA STRUCTURES AND ALGORITHMS
(Computer Science & Engineering)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1. (a) Explain stacks and Queues in detail.
   (b) Write short notes on priority queue.

2 (a) How does one measure efficiency of algorithms?
   (b) Discuss Big 'O' notations in detail.

SECTION - II

3. (a) Construct a binary tree for the following preorder and inorder traversals.
   Preorder : ABDIEHJCFKLGM
   Inorder : DIBHJEAFLKCGM
   (b) Computer Breadth first search and Depth First Search

4. (a) Describe AVL tree rotations in detail.
   (b) Discuss the insertion and deletion operations on Binary search tree with an example.

SECTION - III

5. (a) What is a Red-Black tree? Explain the operations of Red-Black trees with an example.
   (b) Give the properties of Splay tree.

6. (a) Explain the linear probing method in hashing with its performance analysis.
   (b) Explain hashing with chains. Compare this with linear probing.

SECTION - IV

7. (a) Explain the quick sort algorithm.
   (b) Find the best case, worst case and average case time complexity of quick sort algorithm.

8. (a) Explain Strassesn's Matrix Multiplication in detail
   (b) Compare and contrast between greedy method and dynamic programming.

SECTION - V

9. (a) Describe all Pairs Shortest Path and Single Source Shortest Path with an example.
   (b) What is 0/1 Knapsack problem? Explain it with an example.

10. (a) Explain 8 queens problem.
   (b) Write short notes on graph coloring.

Code: 13MME101

M.TECH. DEGREE EXAMINATION, FEBRUARY 2014
M.Tech. I Semester

AUTOMATION IN MANUFACTURING
(Advanced Manufacturing Systems)

Time: 3hrs Max.Marks:60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

SECTION-I

1. Explain different types of production automation and mention their advantages and disadvantages.
2. What is Degree of automation and how can it be made as unity?

SECTION-II

3. Explain different types of automated guided vehicles with applications
4. Discuss about the following

   1) Self Guided vehicles 2) Traffic control in AGV's

SECTION-III

5. What is balance efficiency and Explain Mixed Model Line Balancing method
6. A manual assembly line must be designed for a product with annual demand=1,00,000 units. The line will operate 50 weeks/year, 5 shifts/week, and 8 hours/shift. Work units will be attached to a continuously moving conveyor. Work content time=42 minutes. Assume line efficiency as 0.97, balancing efficiency as 0.92 and repositioning time as 6 seconds. Determine a) Hourly production rate to meet demand and b) number of workers required.

SECTION-IV

7. Explain parts classification and coding strategies in Group Technology
8. What is Flexible Manufacturing and what are various components in Flexible manufacturing System

SECTION-V

9. Compare traditional product development cycle and product development using concurrent engineering
10. a)Explain the methods of shop floor control

    b) Explain Retrieval and Generative computer aided process planning in brief.

13SH1101

M.TECH. DEGREE EXMATION, FEBRUARY 2014

M. Tech. First Semester

DIGITAL SYSTEM DESIGN

(Digital Electronics and Communication Systems)

Time: 3 hours Max. Marks: 60

Answer **FIVE** Questions. Choosing **ONE** Question from each section
All Questions carry equal marks

SECTION- I

1. a) How does the ASM chart differ from a Software flow chart?

   b) What is the difference between Mealy and Moore state machine?

   c) Develop an ASM chart of D flip flop and realize it using only NAND Gates.

2. a) Design and implement a BCD counter on PLA. Draw the complete fuse-map circuit.

   b) Show that how folding will reduce the number of cross points given on the PLA.

SECTION- II

3. a) Draw the general structure of a FPGA and explain how a logic function can be realized on FPGA with an example.

   b) Explain about the following types of faults with an example.
   i) Stuck at faults ii) Bridge faults iii) Temporary faults

4. a) For the following table establish the synthesis procedure of Iterative networks with electronic gates.

	$NS,\ z_i$	
	$x_i=0$	$x_i=1$
A	$A,0$	$B,1$
B	$B,1$	$C,1$
C	$C,1$	$D,0$
D	$D,0$	$D,0$

Table.1 Cell table

$y_{i1}y_{i2}$	$Y_{i1}\ Y_{i2},\ z_i$	
	$x_i=0$	$x_i=1$
00	00, 0	01, 1
01	01, 1	11, 1
11	11, 1	10, 0
10	10, 0	10, 0

Table.2 Output-carries and Cell-output table

   b) Obtain transition and output Table for relay implementation of the above.

SECTION- III

5. a) Using Boolean difference method find the test vectors for SAO fault on input line 1 and SA1 fault on the internal line2 of the circuit shown in figure.1.

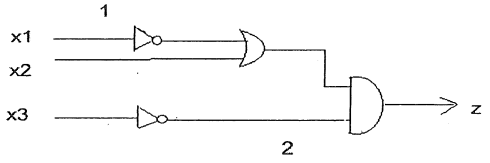


Figure.1

   a) b. Draw the table giving the set of all possible single struck faults and the faulty and fault-free responses and also construct the fault cover table for the circuit in figure.2.

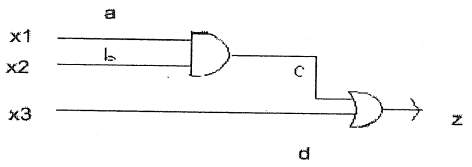


Figure.2

6. Derive $\frac{df}{d(x_1\, x_2)}$ for the majority gate as shown in figure .3.

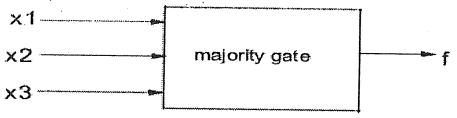


Figure.3

b) b. Apply D-algorithm to detect h SAO fault in the given circuit shown in figure.4 and derive the test vectors.

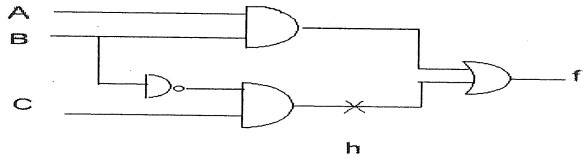


Figure. 4

SECTION- IV

7. a) Explain the following.
   i) Preset distinguishing sequences ii) The distinguishing tree
   iii) The shortest distinguishing prefix

   b) Construct an adaptive distinguishing experiment for machine M shown in table.3 and construct a Partial tree describing the experiment.

PS	$NS,\ z$	
	$x=0$	$x=1$
A	$C,0$	$A,1$
B	$D,0$	$C,1$
C	$B,1$	$D,1$
D	$D,1$	$A,0$

Table.3

8. a) Identify the machine to the input sequence X is the output sequence Z of the following .

$$Time: \ t_1\ t_2\ t_3\ t_4\ t_5\ t_6\ t_7\ t_8$$
$$X: \ 1\ 1\ 1\ 0\ 1\ 0\ 1$$
$$Z: \ 0\ 1\ 0\ 0\ 1\ 0\ 0$$

   b) Describe the procedure to decide whether the actual machine is isomorphic to the one described by State table with an example.

SECTION- V

9. a) List out and briefly explain about the faults that may occur in PLAS.

   b) With an example, explain how faults are detected in a PLA.

10. a) Explain race-free assignment with an example.

    b) Explain minimum closed covers.

Code : 13SH1101

M.TECH DEGREE EXAMINATION , FEBRUARY 2014

M.TECH. I SEMESTER

Probability & Statistics and Computational Techniques

(Power Systems (EEE))

Time : 3 Hours. Max. Marks : 60

Answer Five Questions, Choosing ONE Question from each unit

All Question carry equal marks

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UNIT – I

1. a) The probability density of a continues random variable is given by $f(x)=ce^{-|x|}$, $-\infty<x<\infty$. Show that c = ½ and find that the mean and the variance of the distribution. Also find the probability that the variate lies between **0 and 4.**

   b) Find mean and variance of Poison distribution.

2. a) Out of 800 families with 5 children each, how many would you expect to have (i) 3 boys (ii) 5 girls (iii) either 2 or 3 boys, assume equal probabilities for boys and girls.

   b) If the masses of 300 students are normally distributed with mean 68 kgs and standard deviation 3kgs, how many students have masses (i) greater than 72kgs (ii)less than or equal to 64kgs (iii) between 65 and 71kgs inclusive.

UNIT – II

3. a) A manufacturer of electronic equipment subjects samples of two completing brands of transistors to an accelerated performance test. If 45 of 180 transistors of the first kind and 34 of 120 transistors of the second kind fail the test, what can be conclude at the level of significance $\alpha = 0.05$ about the difference between the corresponding sample proportions?

   b) It is claimed that a random sample of 49 tyres has a mean life of 15200 Km. this sample was drawn from a population whose mean is 15150 kms and a standard deviation of 1200 Km. Test the significance at 0.05 level.

4. a) A pair of dice are thrown 360 time and the frequency of each sum is indicated below

Sum	2	3	4	5	6	7	8	9	10	11	12
Frequency	8	24	35	37	34	65	51	42	26	14	14

Would you say that the dice are fair on the basis of the chi- square test at 0.05 level of significance?

b) Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results.

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

Test whether the two horses have the same running capacity.

UNIT – III

5. a) Find a real root for $x \tan x+1=0$ using Newton – Raphson method.

b) Find a positive root of $x^3 - x - 1 = 0$ correct to four decimal places by Bisection method.

6. a) Given $\sin 45^0 = 0.7071$, $\sin 50^0 = 0.7660$, $\sin 55^0 = 0.8192$ and $\sin 60^0 = 0.8660$.

Find $\sin 52^0$ by using Newton's interpolation formula.

b) Find the first two derivatives at x=1.4 from the following data using Newton's formula.

x	1.0	1.2	1.4	1.6	1.8	2.0
y	0	0.128	0.544	1.296	2.432	4.0

UNIT – IV

7. a) Predict y at $x= 3.75$ by fitting a power curve to the following data

x	1	2	3	4	5	6
y	2.98	4.26	5.21	6.10	6.8	7.5

b) Fit a second degree polynomial to the following data.

x	1	2	3	4	5	6	7
y	2.3	5.2	9.7	16.5	29.4	35.5	54.4

8. a) Evaluate $\int_0^2 e^{-x^2} dx$ using Simpson's rule taking h=0.25

b) Evaluate $\int_0^1 \frac{1}{1+x^2} dx$ (i) Trapezoidal rule and Simpson's $1/3^{rd}$ rule (ii) Simpson's $3/8^{th}$ rule.

UNIT – V

9. Find $y(0.1), y(0.2), y(0.3)$ from $y^1=x^2-y$, $y(0)= 1$ by using Taylor's series method and hence obtain $y(0.4)$ using Adam's – Bashforth method.

10. a) Find the solution of $\frac{dy}{dx} = 2e^x y$, $y(0)=2$ at $x=0.1, 0.2$ *and* 0.3 using modified Euler's method.

b) Find the value of y for $x=0.1$ by Runge – Kutta method given that $\frac{dy}{dx} = \frac{y-x}{y+x}, y(0) = 1$

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