

AR13

SET 1

Code No: 13MTE1009

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I M.Tech. I Semester Regular / Supplementary Examinations, March 2015

**NON CONVENTIONAL ENERGY SOURCES
(THERMAL ENGINEERING)**

Time: 3 hours

Max. Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1.
 - a) Write about any one solar radiation measuring instrument.
 - b) Compare renewable and conventional energy systems.
2.
 - a) Explain solar refrigeration.
 - b) Write about solar ponds.
3.
 - a) Give and explain the classes of geothermal regions.
 - b) With Schematic diagram explain heat extraction from a hot dry rock system.
4.
 - a) Discuss principle of operation for fuel cells.
 - b) Explain photovoltaic generation
5. Give classification and general types of biomass energy process. Short notes on aerobic and anaerobic digestion.
6.
 - a) Classify and explain electricity systems using wind energy
 - b) Describe the various types of electrical generator and of electricity networks or 'grids' for wind energy conversion.
7. Explain working principle of OTEC with schematic. Give advantages and major disadvantages.
8. Write short notes for any two of the following
 - i. Hydrogen production methods.
 - ii. Power from tides
 - iii. Any one device for extracting energy from waves.

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SET-02

Code No.13MDE1002

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TAKKALI
(AUTONOMOUS)**

I M.Tech. I Semester Regular / Supplementary Examinations, March 2015

ADVANCED DIGITAL SIGNAL PROCESSING

(Digital Electronics & Communication System)

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. By means of the DFT and IDFT, determine the response of the FIR filter with impulse response $h(n) = \{1, 2, 3\}$ and the input sequence $x(n) = \{1, 2, 1\}$.
2. (a) Compare Butterworth and Chebyshev IIR filters.
(b) Convert the analog filter with the system function $H(s) = \frac{2}{(s+1)(s+2)}$ into a digital IIR filter by means of the Impulse Invariance method. Take $T=1$ sec.
3. Design a LPF using Rectangular window by taking 9 samples of $w(n)$ and with cut off frequency 1.2 rad/sec. Draw its Magnitude and Phase response.
4. Consider the FIR filter with the system function
$$H(z) = 1 + 2.88z^{-1} + 3.4048z^{-2} + 1.74z^{-3} + 0.4z^{-4}$$

Sketch the lattice realization of the filter and determine in detail the corresponding input-output equations. Is the system minimum phase?
5. Compare the computational requirements of Welch and Blackman-Tukey Nonparametric Power Spectrum Estimates.
6. Write short note on
 - (a) Quantization noise.
 - (b) Representation of numbers.
 - (c) Round-off Error.
7. What is the difference between DFT and FFT? Verify Parseval's theorem for the sequence $x(n) = \{1, 2, 3, 3, 2, 1, 1, 2\}$ using DIT FFT.
8. Explain the steps in the design of IIR filter in (i) analog low pass Butterworth technique (ii) Chebyshev low pass filter.

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SET-02

CODE : 13MIT1006

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I M.Tech. I Semester Regular / Supplementary Examinations, March 2015

OBJECT ORIENTED SOFTWARE ENGINEERING

(INFORMATION TECHNOLOGY)

Time: 3 Hours

Max. Marks: 60

Answer any Five Questions

All Questions carry equal marks

1. Describe the strengths of iterative and incremental Life cycle Models?
2. What is Software Process? Explain about four phases of unified process and CMM levels?
3. Explain about the importance of stepwise refinement and discuss about taxonomy of CASE?
4. Describe about inheritance, polymorphism and dynamic binding with example?
5. Explain about generalization, aggregation and association with example?
6. Describe about a) Use-Case modeling b) Class Modeling
7. Discuss about Object oriented Design process?
8. Discuss about IIM (Implementation, Integration and maintenance) Phases in OOSE.

Code: 13MPE1005**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMUS)****I M.Tech I Semester Regular / Supplementary Examinations, March 2015****MODERN CONTROL THEORY****(Power Electronics and Electric Drives)****Time: 3 Hours****Max Marks: 60****Answer any FIVE questions****All questions carry Equal marks**

1. a) Explain the properties of Vectors and Vector spaces. [6M]
 b) What is eigen value? Prove that the eigen values of 'A' are invariant under linear transformation. [6M]

2. a) Compute the state transition matrix e^{At} for $A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$ [6M]
 b) Obtain the state model of the system described by the differential equation. [6M]

$$\ddot{Y} + 6\dot{Y} + 11Y = \ddot{U} + 8\dot{U} + 17U + 8U$$

3. a) Define controllability and observability of a continuous time systems [4M]
 b) Find the controllability and observability for the system described by the state equations. [8M]

$$\begin{matrix} \dot{X} = & AX + BU \\ Y = & CX \end{matrix} \quad \text{where } A = \begin{bmatrix} 1 & 2 \\ -4 & -3 \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \end{bmatrix} \quad C = \begin{bmatrix} 1 & 1 \end{bmatrix}$$

4. Explain and derive the describing function of dead zone with saturation non linearity [12M]
 5. What is a singular point? Explain the different types of singular points in non linear control systems based on the location of eigen values of the system. [12M]

6. a) State and explain the Lyapunov's stability theorem. [6M]
 b) For the system $\dot{X} = \begin{bmatrix} 0 & 1 \\ -2 & -4 \end{bmatrix} X$

Find the lyapunov function $V(x)$ [6M]

7. a) Derive the Euler-langrange equation [6M]
 b) Determine the smooth curve of smallest length connecting the point $x(0) = 1$ to the line $t = 5$ t_f is fixed and x_f is free. [6M]

8. a) write short notes on Pontrygin's minimum principle. [6M]
 b) Briefly explain the minimum time and minimum fuel problem of an optimal control problem. [6M]

Code No: 13MVL1007

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I M.Tech. I Semester Regular / Supplementary Examinations, March 2015

ELECTRONIC DESIGN AUTOMATION TOOLS

(VLSI System Design)

Time: 3 hours

Max. Marks: 60

**Answer any FIVE questions
All questions carry equal marks.**

1. a) Explain the feature of system tasks with examples.
 b) Describe various timing controls and conditional statements.
2. a) Explain the types of structured procedures in behavioral modeling?
 b) Write verilog HDL code for 4-bit shift register using the instance of D-flip flop .
3. a) Discuss the modeling of ROM memory by writing the Verilog HDL code.
 b) Describe the working of logic simulation with examples.
4. a) Explain the concept of cell models with neat diagrams
 b) Give the process involved in switch level simulation.
5. Write and explain spice program for the following circuits
 a) Sample and Hold Circuit
 b) D/A Converter
6. a) Discuss the concept of Integration To CAE Environments in mixed signal design.
 b) Give the analysis of D/A converter with necessary circuit diagrams
7. Describe the several stages of PCB design and the tools required for designing the PCB.
8. Write short notes on any TWO:
 a) Data types.
 b) Spice models for BJT.
 c) Simulation And Layout Tools in PCB design.

Code No: 13MCS1006**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I M.Tech. I Semester Regular / Supplementary Examinations, March 2015****OBJECT ORIENTED PROGRAMMING****(Computer Science and Engineering)****Time: 3 hours****Max. Marks: 60****Answer any FIVE questions
All questions carry equal marks**

1. a) Briefly explain the features of java. [8M]
b) Explain how multiple inheritances are achieved in java. [4M]
2. a) Define a package. Explain different visibility control mechanisms [7M]
b) Explain the keyword 'static'. [5M]
3. a) What is exception handling? Explain the keywords used in exception handling? [6M]
b) Write a program to demonstrate how user defined exceptions are created in java [6M]
4. a) Write a program to demonstrate Dynamic method dispatch? [8M]
b) Define constructor? Demonstrate constructor overloading with an example? [4M]
5. a) Define a Thread? Explain thread life cycle with a neat diagram? [6M]
b) Explain inter thread communication with the help of a program. [6M]
6. a) Define an applet. Explain applet life cycle methods with the help of an example program. [7M]
b) How do you pass parameters to an applet from a HTML page. [5M]
7. a) What is an event ? Explain Delegation Event Model in java with the help of an example program. [7M]
b) Explain adapter classes. [5M]
8. a) Explain TCP/IP sockets. [6M]
b) Design a TCP client-server application that simulates a chat server [6M]
