AR13 **Set-01**

Code: 13MTE 1014

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I M.Tech II Semester Regular/ Supplementary Examinations, August–2016

Computational Fluid Dynamics

(Thermal Engineering)

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

Answer any FIVE questions

All questions carry equal marks

1. a. Write in detail about difference between finite difference method, finite volume method and finite element method.
   b. What are different methods to evaluate matrix inverse for the solution of simultaneous algebraic equations? Compare them

2 a. What are the four basic rules for discretization using Finite Volume Method?
   b. Explain with an example about Classification of Discretization techniques used in Finite volume method and their applications.

3. a. Write in detail about ADI Scheme and Implcit scheme with an example
   b. Explain the finite difference method for any governing equation with a suitable boundary conditions.

4. a. Write in detail about Explicit scheme with an example.
   b. Explain truncation error in the FDM and describe about estimation of truncation error with an example.

5. a. A steel rod of length, 50 cm, diameter, 2 cm and thermal conductivity, 55 W/m- K is kept at a temperature of 150^0C at its base. The fin is exposed to fluid of heat transfer coefficient, 15 W/m^2K and temperature, 20^0. The tip of the rod is kept at 40^0C. Obtain the nodal equations for temperature distribution through fin using finite volume method
   b. Discuss different methods to solve the convective – diffusion terms of Differential Equation.

6. a. A stainless steel rod of 20 mm diameter is carrying an electric current of 1000A. The thermal and electrical conductivities of the rod are 20 W/m-K and 1.25 X 10^4 $(\text{Ohm-cm})^{-1}$ respectively. Obtain the nodal equations for steady state temperature distribution of the rod when the outer surface is kept at 400^0C.
   b. Give the classification of linear DEs. What are the different discretization schemes that are used to solve parabolic equations? Compare them.

7. a. Define Vorticity? How the pressure gradient term eliminated from the momentum equations using Vorticity – Stream Function method? What are the disadvantages of this method in determination flow field.
   b. Explain in detail about CRANK – NICHOLSON technique and their Significance.

8. Write Short Notes on
   a. Discuss in detail with an example about formulation of Direct Numerical Simulation Turbulence modeling.
   b. Discretization schemes and their assessment.
   c. What are the basic parameters used to assess interpolation schemes in finite volume accumulation of Convection – Diffusion problems?

******

AR13 **Set-02**

Code No: 13MDE1006

ADITYA INSTITTE OF TECHNOLOGY AND MANAGEMRNT, TEKKALI
(AUTONOMOUS)

I M.Tech II Semester Regular/ Supplementary Examinations, August–2016
CODING THEORY AND PRACTICE
(Digital Electronics & Communication Systems)

Time: 3 hours **Max Marks: 60**

Answer Any FIVE questions
All questions carry equal marks

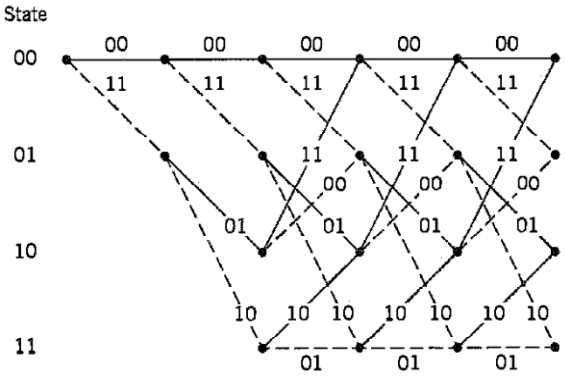
1 a) Discuss different wireless channel statistical models in detail [6M]
b) Explain Channel coding Theorem and channel coding gain [6M]

2 a) Explain about Galois fields and extended finite fields [6M]
b) Explain the basic properties of RS codes. [6M]

3 a) Write short notes on LDPC encoder [6M]
b) Write short notes on BCH codes [6M]

4 Briefly explain the following with a simple example [12M]
a) Code Tree
b) State Diagram
c) Trellis Structure.

5 The Trellis diagram of a rate-1/2, constraint kength-3 is shown in fig. The all zero sequence is transmitted, and the received sequence is 100010000. Using the Viterbi algorithm, compute the decoded sequence. [12M]



6 a) Explain the distance properties of turbo codes [6M]
b) Explain BCJR algorithm with an example [6M]

7 a) Explain spatial correlation and MIMO Channel model with relevant expressions [6M]
b) Explain linear space time codes with no CSI [6M]

8 a) define rate gain and diversity gain and explain them in detail [6M]
b) Explain trellis space time codes [6M]

****

AR13 **Set-02**

Code No.13MPE1012

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TAKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular/ Supplementary Examinations, August–2016

ADVANCED DIGITAL SIGNAL PROCESSING AND APPLICATIONS
(Power Electronics and Electric Drives)

Time: 3 hours **Max Marks: 60**

Answer any FIVE questions
All questions carry EQUAL marks

1. Derive 8 point radix 2 DIF FFT algorithm with necessary equations and draw the Butterfly diagram.

2. Find the direct form - I and direct form – II realizations of a discrete time system represented by the transfer function

$$H(z) = \frac{3z^3 - 5z^2 + 9z - 3}{\left[z - \left(\frac{1}{2}\right)\right]\left[z^2 - z + \left(\frac{1}{3}\right)\right]}$$

3. (a) Explain the relation between analog and digital frequencies in Bilinear Transformation.
   (b) Apply the Bilinear Transformation to $H(s) = \frac{4}{(s+3)(s+4)}$ with T = 0.5 s and find H(z).

4. (a) Compare FIR and IIR filters.
   (b) Explain the errors due to quantization.

5. Derive the condition of FIR filter to be linear in phase.

6. (a) How can you design a digital filter from analog filter?
   (b) What are the disadvantages of Fourier series method?
   (c) What are the properties of a system?

7. Explain the architecture of TMS320LF2407A DSP controller.

8. (a) Explain how the PWM waveforms are generated with compare units.
   (b) Explain Quadrature Encoder Pulse circuit.

****

AR13 **Set-02**

Code No: 13MVL1012

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular/ Supplementary Examinations, August–2016
DESIGN OF FAULT TOLERANT SYSTEMS
(VLSI System Design)

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

Answer any FIVE questions
All questions carry equal marks

1 (a) Derive the relationship between Maintainability and Availability. [6M]
(b) Derive the reliability of parallel and series combinational circuits. [6M]

2 (a) Explain the operation of TMR system. [6M]
(b) Write notes on SMR configuration and discuss its merits and demerits. [6M]

3 (a) Explain the basic concepts of self checking system. [4M]
(b) With an example, explain the operation of self- checking Berger code Checker. [8M]

4 (a) With suitable example, explain the fail-safe design approach of sequential circuit using Berger code. [6M]
(b) Discuss about totally self-checking PLA design. [6M]

5 (a) Define the terms (i) Testability (ii) Controllability (iii) Observability. [2+2+2]
(b) With an example, explain the operation of OR-AND-OR design. [6M]

6 Explain the theory and operation of linear feedback shift register. [12M]

7 Explain the types of test pattern generation for BIST. [12M]

8 Write a short note on:
(a) Boundary Scan. [6M]
(b) BIST concept. [6M]

****

SET-1

AR13

Code No: 13MCS1010

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular/ Supplementary Examinations, August–2016

WEB TECHNOLOGIES
(Computer Science and Engineering)

Time: 3 hours **Max Marks :60**

Answer any FIVE questions
All questions carry equal marks

1.	a)	What is HTML? Write a HTML Script to manage personal details of a student like name, class, qualifications, photo, address etc., using tables and other suitable tags.	[6M]
	b)	Explain briefly about JavaScript Objects. Write a JavaScript program to search for a particular pattern in a given user string using the necessary JavaScript object methods.	[6M]
2.	a)	Explain different ways of applying Cascading styles to a web page with suitable example.	[6M]
	b)	Explain in detail about Document Object Model in Java Script.	[6M]
3.	a)	What is Java Bean? Discuss the process of Introspection for a bean.	[6M]
	b)	Demonstrate creation of a simple bean which needs to be connected to other components via the BDK.	[6M]
4.		Develop a Student XML database. Explain the role of DTD and XML Schema in validating the XML file.	[12M]
5.	a)	Why do you need inter-servlet communication?	[6M]
	b)	Differentiate between CGI and servlet. Explain the Lifecycle of a Servlet.	[6M]
6.	a)	Discuss the structure of HTTP request and HTTP response in Java Servlets.	[6M]
	b)	Write a Java Servlet to display net salary of an employee, use JDBC connectivity to get employee details from data base.	[6M]
7.	a)	Discuss the anatomy of JSP.	[6M]
	b)	Explain about action elements and various types of directives in JSP.	[6M]
8.	a)	What is database connectivity? Explain the basic connectivity, middleware support, and ODBC, JDBC technologies.	[6M]
	b)	List and Explain about the steps involved in establishing database connection to java application.	[6M]

AR 13

Code No: 13MSE1014 SET-1

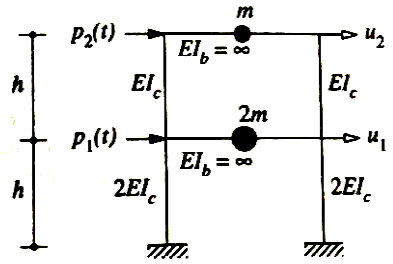
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
M. Tech. II Semester Regular Examinations, August-2016

Structural Dynamics and Earthquake Resistant Design
(STRUCTURAL ENGINEERING)

Time: 3 hours **Max Marks: 60**

Answer any FIVE questions
All questions carry equal marks

1. Derive the response for free vibration with viscous damping and plot the response?
2. A free vibration test is conducted on an empty elevated water tank. A cable attached to the tank applies a lateral force of 50kN and pulls the tank horizontally by 60mm. cable is suddenly cut and resulting free vibration is recorded. At the end of four complete cycles, the time is 4sec and amplitude is 20mm. from these data compute the following: a) damping ratio b) natural period of undamped vibration c) stiffness d) weight e) damping coefficient f) number of cycles required for the displacement amplitude to decrease to 2mm?
3. Using Duhamel's integral, compute the response of an undamped system to a rectangular pulse force of amplitude (p) & duration (t)?
4. Summarize the characteristics of Response Spectrum and compare the design and response spectra?
5. Calculate the Natural frequency of Generalized SDOF Lumped mass system three story building plan area 5*5m size of column 300*300 mm, size of beam 300*450mm ,slab thickness 150mm height of each floor 3m
6. Formulate the equations of motion for the two-story shear frame shown in fig. Also compute the natural frequencies of the frame considering free vibration?



7. A five storied RCC framed building of residential type is to be constructed at Vijayawada. Plan area of building is 12m x 12m. There are three bays on either side with each bay of 4m span. All beams are of 300mmx450mm size and all columns are of size 300mmx300mm. Floor height is 3.5m. Slab thickness is assumed to be 120mm. Determine the seismic forces at all floor levels by seismic coefficient method. Assume any other data suitably.

8. A five storied RCC framed building of commercial type is to be constructed at Hyderabad. The plan area of building is 20m x 15m. Size of the bay on either side is 5m. Height of floor is 3.7m. The lumped weight due to dead loads is 15kN/m^2 on the floors and 10kN/m^2 on the roof. Determine the base shears on the structure using response spectrum method at each slab level. Assume any other data suitably.

****

2 of 2

****