

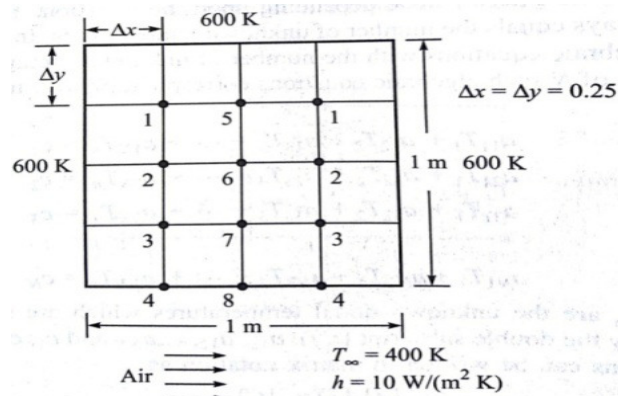
Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Discuss the various applications of CFD 5M
- (b) Discuss the criterion by which a given partial differential equation is classified as hyperbolic, parabolic or elliptic 7M
2. (a) Solve the following algebraic equations using Gauss Siedel iterative method

$$x + 4y - z = -5$$

$$x + y - 6z = -12$$

$$3x - y - z = 4$$
 10M
- (b) State the continuity equation for inviscid flow in partial differential non-conservative form. 2M
3. Three sides of a square plate of $1\text{ m} \times 1\text{ m}$ are kept at a temperature of 600 K as shown in Fig. While one side is exposed to a stream of air at 400 K with convective heat transfer coefficient $h = 10\text{ W/m}^2\text{K}$. with the help of numerical method, determine the steady state temperature distribution within the plate. Take thermal conductivity of the plate $k = 2.5\text{ W/mK}$



4. (a) Derive second order accurate central difference approximation for the second derivative of 'f' with respect to 'x' using Taylor series expansion 7M
- (b) Explain different boundary conditions used in CFD 5M
5. Using Vorticity and Stream function method, derive the expression for momentum equation without pressure term. What are its advantages and disadvantages compared with other methods. 12M
6. Explain the methods of computation for a one dimensional second order differential equation as given below using (i) FDM (ii) FVM

$$\frac{\partial^2 u}{\partial x^2} - 2 = 0$$
 The boundary conditions are $u = 0$ at both $x = 0$ and $x = 1$ 12M
7. (a) Explain the need of staggered grid 4M
- (b) Why stability criteria needs to be satisfied for the explicit method of solving the transient equation? explain 8M
8. (a) Explain difference between SIMPLE and SIMPLER methods 8M
- (b) Explain CRANK NICHOLSON technique 4M

**CODING THEORY & TECHNIQUES
(DECS)**

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Describe the automatic repeat request and forward error coding mechanisms and compare them 6M
(b) Explain the need for and operation of source encoder and channel encoder in digital communications 6M
2. (a) Consider a (5,2) systematic linear block code where the parity bits are generated as $\mathbf{b}_0 = \mathbf{m}_0$, $\mathbf{b}_1 = \mathbf{m}_1$ and $\mathbf{b}_2 = \mathbf{m}_0 + \mathbf{m}_1$. Find the (i) generator matrix (ii) parity check matrix (iii) all codevectors in the code. 6M
(b) Describe the syndrome decoding procedure for linear block codes 6M
3. (a) Define the logarithmic measure of information and mention its properties. A discrete memoryless sources emits messages from the set {A, B, C} with probabilities 1/2, 1/3, 1/6. Find the (i) information contained in each message (ii) average information per message and (iii) information contained in the message AABCA 6M
(b) Describe the applications of block codes in data storage systems 6M
4. (a) Define a cyclic code and mention its properties and advantages 6M
(b) Compute the message and codeword polynomials of a (7, 3) cyclic code generated by $g(X) = 1 + X + X^2 + X^4$ 6M
5. (a) Explain the decoding of cyclic codes with a neat block diagram 6M
(b) Write short notes on error trapping decoder for cyclic codes 6M
6. (a) Distinguish between linear block codes and convolutional codes. Draw the feedforward convolutional encoder described by the generator sequences $\mathbf{g}^0 = [1\ 0\ 1\ 1]$ and $\mathbf{g}^1 = [1\ 1\ 1\ 1]$ 6M
(b) Describe the structural and distance properties of a convolutional code 6M
7. (a) Draw the trellis diagram and state diagram of a rate $\frac{1}{2}$ feedforward convolutional encoder described by the generator sequences $\mathbf{g}^0 = [1\ 1\ 1]$ and $\mathbf{g}^1 = [1\ 0\ 1]$ 6M
(b) Distinguish between maximum likelihood decoding and sequential decoding 6M
8. (a) Explain the salient features of burst error correcting codes and describe the decoding of single burst error correcting cyclic code 6M
(b) Write short notes on BCH codes and their minimum distance properties 6M

AR16

CODE: 16MPE1012

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M.Tech. II Semester Regular Examinations, July-2017
ADVANCED DIGITAL SIGNAL PROCESSING AND ITS APPLICATIONS
(PED)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) List the advantages and disadvantages of digital signal processing? 6M
(b) A casual LTI discrete time system develops an output
 $y[n] = (0.4)^n u[n] - 0.3(0.4)^{n-1} u[n-1]$ for an input $x[n] = (0.2)^n u[n]$. Develop a parallel form realization of the system 6M
2. (a) Compare Discrete Fourier Transform (DFT) & Fast Fourier Transform (FFT) with examples? 6M
(b) Explain about interpolation process with an example? 6M
3. Discuss the procedure for the design of IIR filters with the constraints using analog structures? 12M
4. Compare the different realizations of an IIR filter of order M 12M
5. Design of Band pass and Band stop IIR digital filters with an example? 12M
6. (a) Design of Minimum phase FIR filters with an example? 6M
(b) Explain the effects of finite register length & coefficients in realization of Digital Filters? 6M
7. (a) Describe Program control Data formats & Addressing modes of TMS320LF2407A processor? 6M
(b) Draw Internal architecture of TMS320LF 2407A controller with a neat sketch? 6M
8. (a) Write short notes on Event Manager (EV) functional blocks & Event Manager Interrupts with an example? 6M
(b) Briefly explain Space Vector PWM with their capture units? 6M

AR16

CODE: 16MVL1012

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M.Tech. II Semester Regular Examinations, July, 2017

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) Discuss the Need for Testing with advantages and What is Maintainability, and Availability 6M
(b) Derive the relationship between reliability and failure rate? 6M
2. (a) Derive the expression for Availability and Maintainability? 6M
(b) Evaluate the series and parallel systems in combinational circuits. 6M
3. (a) Explain the use of error correcting codes with an example? 6M
(b) Discriminate the function of Triple Modular Redundant System? 6M
4. (a) Explain in detail about Self purging redundancy? 6M
(b) Discuss about totally self checking PLA design? 6M
5. (a) Illustrate the basic concept of self checking design and its advantages? 6M
(b) Design a totally self checking checker for m out of n codes? 6M
6. (a) Explain Reed Muller's expansion technique for testable combinational circuits? 6M
(b) Differentiate between Controllability and Observability with example? 6M
7. (a) Discuss about use of control and syndrome-testable design? 6M
(b) Outline the Level Sensitive Scan Design rules? 6M
8. (a) Evaluate the concept of BIST and Classify test pattern generation for BIST? 6M
(b) Explain the operation of LFSR as signature analyzer? 6M

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I M.Tech II Semester Regular Examinations, July-2017****WEB TECHNOLOGIES
(Computer Science and Engineering)**

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Explain how web pages are made dynamic using DHTML using an example? [6M]
(b) What is an event? List and explain the events handled by JavaScript. [6M]
2. (a) What is DTD? Explain its purpose. What are the limitations of DTD? [6M]
(b) "XML Schemas depends on XML syntaxes for their Documentation", explain the feature and its advantages. [6M]
3. (a) How do you handle HTTP request and HTTP responses in servlet? Elucidate an example. [6M]
(b) Explain HTTP session interface. [6M]
4. (a) What are the limitations of servlets? How JSP overcomes these problems? [6M]
(b) Describe the anatomy of a JSP page. [6M]
5. (a) Write the steps involved to establish connection to the database using JDBC. [6M]
(b) Explain about prepared and callable statements [6M]
6. Explain in detail about spring frame work and explain spring framework modules [12M]
7. (a) Explain about implicit JSP objects. [6M]
(b) Explain about Request dispatching in JSP page with example. [6M]
8. (a) How do you deploy Java beans in a JSP page. [6M]
(b) Briefly discuss XML advantages. [6M]

**STRUCTURAL DYNAMICS AND EARTHQUAKE RESISTANT DESIGN
(Structural Engineering)****Time: 3 Hours****Max Marks:60**

Answer any FIVE questions
All questions carry EQUAL marks

1. a. Explain the various types of waves generated due to earthquakes 6 M
b. What do you understand by earthquake? Explain with details. 6 M
2. Explain the following
a. Hypocenter & Epicenter 12 M
b. Degrees of freedom
c. Types of vibrations
3. An SDF system is excited by a sinusoidal force. At resonance the amplitude of displacement was measured to be 65 mm. At an exciting frequency of one tenth the natural frequency of the system, the displacement amplitude was measured to be 4 mm. Estimate the damping ratio of the system. 12 M
4. Write down the equation for dynamic equilibrium for a single degree of freedom system. Solve this equation for un-damped free vibration. 12 M
5. A steel portal frame is subjected to free vibrations by giving an initial displacement without velocity. Taking the damping as 47 of critical, find the characteristics of motion. The total mass of 40 tonnes is lumped at roof level and the column which are 10m high and 16m apart, can be taken as weightless. Take $E=2.1 \times 10^{11} \text{ N/m}^2$ and the moment of inertia of each column as 0.0008 m^4 . 12 M
6. Describe the Rayleigh's method for the determination of frequency in the fundamental mode of vibrations. 12 M

7. Analyze the two bay two storeys RC frame by any appropriate approximate method of analysis. Lateral force of 120 kN & 80 kN is acting at first & second floor respectively. Storey height = 3 m & bay width of each bay = 4 m. 12 M
Draw axial force, shear force & bending moment diagram.
8. a. Explain the recommendations of IS code for detailing of RC beams for ductility. 6 M
- b. A column in a multistory R.C building is subjected to an axial force of 2500 kN and bending moment of 650 kN-M under gravity and earthquake loads. Define the column section for ductility. Use M20 concrete and Fe415 grade steel. 6 M