Code No: 13MTE1004

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech I Semester Regular/Supplementary Examinations, February-2016
ADVANCED FLUID MECHANICS
(Thermal Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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1. a) Differentiate between between the Eulerian and Lagrangian methods of representing fluid flow.
   b) The velocity potential function for a two-dimensional flow is $\emptyset = x(2y - 1)$.Determine the velocity and value of stream function at a point P(4,5).

2. a) Write short notes on Poiseuille flow and Couette flow
   b) Oil flows through a 25 mm diameter pipe with mean velocity of 0.3 m/s. Given that the viscosity $\mu = 4.8 \times 10^{-2}$ kg/ms and the density $\rho = 3800$ kg/m^3, calculate:
   (i) The friction head loss and resultant pressure drop in a 45 m length of pipe, and;
   (ii) The maximum velocity, and
   (iii) The velocity 5 mm from the pipe wall.

3. Derive Von Karman momentum integral equation.

4. A plate 25m long x 1.25m wide is moving under water in the direction of its length. The drag force on the two sides of the plate is estimated to be 8500N.Determine: The velocity of the plate, the boundary layer thickness at the trailing edge of the plate and the distance at which the laminar boundary layer existing at the leading edge transforms in to turbulent boundary layer. Take for water ρ =1000 kg/m^3; ϑ=1X10^{-6} m^2/s

5. Explain about boundary layer separation. What are the different methods of preventing the separation of boundary layer?

6. A smooth pipeline of 100 mm diameter carries 2.27m^3 per minute of water at 20^{0}c with kinematic viscosity of 0.009 stokes. Calculate friction factor, maximum velocity and shear stress at the boundary.

7. a) Obtain an expression in differential form for continuity equation for one-dimensional compressible flow
   b) An Aeroplane is flying at 1000 km/hr through still air having a pressure of 78.5 kN/m^2 (abs.) and temperature -8^{0}C.Calculate on the stagnation point on the nose of the plane: Stagnation pressure, stagnation temperature and stagnation density.
   Take γ = 1.4 and R = 287 J/kg.K.

8. a) Derive an expression for the condition of maximum mass flow through a nozzle.
   b) What is mach number? Why is the parameters so important for the study of flow of compressible fluid?

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Code No:13MDE1001

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMOUS)
I M.Tech I Semester Regular/Supplementary Examinations, February-2016
DETECTION & ESTIMATION OF SIGNALS
(Digital Electronics & Communication Systems)
Time: 3 hours　　　　　　　　　　　　　　　　　　　**Max.Marks:60**

Answer any FIVE questions
All questions carry equal marks

1.　　a) Find the transfer function and unit sample response of the second order difference equation with zero initial condition $y(nT) = x(nT) – 0.5\ y(nT-T)$
　　　b) Prove that the frequency response of a discrete system is a periodic function of the frequency.

2.　　a) The PSD of random process 0 given by $S_{xx}(w)= A,\ -k<w<k$
　　　　　　　　　　　　　　　　　　　　　　　　$0,$ otherwise
　　　b) Explain generation of pseudo-random noise.

3.　　a) Explain the neymen-pearson criterion for radar detection of constant amplitude signal.
　　　b) Explain the basic principle of matched filter in the detection of signals in additive white Gaussian noise.

4.　　Derive an expression for the estimation signal using linear mean squared estimation

5.　　Explain the fundamental role of optimum linear filter.

6.　　Derive an expression for the probability of error for the detection of equal energy, orthogonal signals observed in additive white noise.

7.　　Discuss with suitable derivation, the estimation of signal parameter using recursive linear mean squared estimation. Assume that the signal is random in nature.

8.　　Write short notes on
　　　a) Maximum likelihood estimate of parameters of linear system.
　　　b) Sampling of bandlimited random signals.

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ADITA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech I Semester Regular/Supplementary Examinations, February-2016
MICROCONTROLLER AND APPLICATIONS
(Power Electronics and Electric Drives)

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

Answer any FIVE questions
All questions carry EQUAL marks

1.　a) Explain on chip RAM structure of 8051 Microcontroller.
　　b) Explain the alternate functions of Port 3 pins of 8051 microcontroller

2.　a) Explain Bit manipulation instruction of 8051 with suitable example.
　　b) Explain about 8051 micro controller addressing modes.

3.　a) List the features of timer and counters
　　b) Explain Timer register, TCON, TMOD registers of 8051 and show the format

4.　a) Explain the features of Atmel 89C51 and 89C2051 microcontroller.
　　b) Write an ALP in 8051 to generate square wave using timer on P1.0 of port 1

5.　a) What is an interrupt? What are the different interrupts available in PIC 16C61/71
　　　microcontroller.
　　b) List the addressing modes of PIC 16C71.

6.　Explain pins of 16F8XX PIC flash microcontroller with a neat diagram.

7.　With a Schematic, explain the interfacing of 7-segment display unit with 89C51
　　microcontroller and explain the inter facing of LED with 89C 51 micro controller.

8.　List the different measurement applications of 8051 microcontroller. Show an interface
　　set up to measure the temperature using temperature sensor, ADC device, 8051
　　microcontroller.

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Code No: 13MVL1004   **SET-1**

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

VHDL MODELLING OF DIGITAL SYSTEMS
(VLSI System Design)

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

Answer any FIVE questions
All questions carry equal marks.

1.   a) Describe simulation, synthesis and design entry used for system design using CAD tools.
   b) With neat diagram explain the VHDL design procedures used for system design.

2.   a) Explain the concurrent and sequential assignments with examples.
   b) Discuss about the parts library wiring of primitives.

3.   a) Explain the Packaging Parts and Utilities with example programs.
   b) Describe in detail design configuration and design libraries.

4.   a) Explain the predefine attributes and user define attributes with examples.
   b) Discuss about the subprogram parameter types and overloading.

5.   a) Write a data flow description for a full adder in VHDL.
   b) Write VHDL program for the function $Y = \overline{AB} + \overline{C}D$ using behavioral modelling.

6.   a) Explain the open collector gates in detail.
   b) Describe 8-bit shift register using behavioral modelling.

7.   a) Explain the process statement, section statement and sequential wait statements with suitable VHDL example codes.
   b) Design 8X1 multiplexer using 2X1 multiplexer and write the VHDL code implementation using structural modeling.

8.   Write short note on the following
   a) MSI-Based Design
   b) State machine description.

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SOFTWARE ENGINEERING

(Computer Science and Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1.	a)	What is software engineering ? Explain the Capability Maturity Model Integration.	6M
	b)	What is process model? Explain about various types of models in detail.	6M
2.		What is feasibility study? Explain the elicitation, analysis, validation and management of requirements in detail.	12M
3.	a)	Discuss about various design concepts and models.	6M
	b)	What is software architecture? Explain the architectural styles and patterns.	6M
4.		What is object oriented design? How is user interface design performed? Explain.	12M
5.	a)	What is software testing ? Discuss about validation testing and system testing with aid of sample test cases.	6M
	b)	What is debugging? Explain.	6M
6.	a)	What is software quality management? Explain.	6M
	b)	Explain the RMMM plan in detail.	6M
7.	a)	What is software cost estimation? Explain.	6M
	b)	Differentiate between functional and non functional requirements.	6M
8.	a)	Explain about context behavior models of data models.	6M
	b)	Discuss about risk identification, risk projection and risk refinement.	6M

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Code No: 13MSE1004 **SET-1**

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

THEORY OF PLATES AND SHELLS
(STRUCTURAL ENGINEERING)

Time : 3 hours   Max Marks : 60

Answer any FIVE questions
All questions carry equal marks

1   Write the derivation for plate equation in transverse bending?

2   Write about the cylindrical bending of a uniformly loaded rectangular plate
         with Simply supported edges?

3   Write about the differential equation for symmetrical bending of a laterally
         loaded Circular plate?

4   Write upon the derivation of Stress resultants?

5   Write about the application to the analysis and design of Short and Long shells?

6   Write the details of the Schorer Differential equation and Schorer characteristic
         equation. Also give a few comments on the Schorer theory?

7   Write a short note on the differences involved in the principles of bending theory
         and membrane theory?

8   Write a short note on the analysis and design of Conoidal and Hyperbolic paraboloid?
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