AR16 SET 1

Code No: 16MTE1004

ADITYA INSTITUE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M.Tech. I Semester Regular & Supplementary Examinations, December-2018

ADVANCED FLUID MECHANICS

(Thermal Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1. a) Define one, two and three dimensional flows [6M]
   b) Find the acceleration and vorticity components at a point (1,1,1) for the following flow of a fluid $u=2x^2+3y$; $v= -2xy+3y^2+3zy$: $w= -3/2\ z^2 + 2xz - 9y^2z$ [6M]

2. Derive Navier-Stoke's equations for unsteady three dimensional viscous, incompressible and irrotational flows. [12M]

3. a) What do you understand by 'boundary layer'? Illustrate this concept with reference to flow over a flat plate and flow through a circular plate. [7M]
   b) Explain the concept of boundary layer separation. [5M]

4. Calculate the friction drag on a plate of 15 cm wide and 45 cm long placed longitudinally in a stream of oil (specific gravity 0.0925 and kinematic viscosity 0.9 stokes) flowing with a free stream velocity of 6 meters per second. Also find the thickness of the boundary layer and shear stress at the trailing edge. [12M]

5. a) Explain the characteristics of turbulence flows. Compare the velocity profiles of laminar and turbulent flows for a flow through a pipe and for a flow over a flat plate. [5M]
   b) Explain Prandtl's mixing length hypothesis. [7M]

6. a) Explain the terms i. Mach number ii. Mach Cone iii. Mach Line iv. Mach Angle. [4M]
   b) Establish the continuity, momentum and energy equations for compressible flows. Compare these equations with incompressible flow. [8M]

7. a) How does the velocity and pressure vary with area for [6M]
      i. Subsonic flow ii. Supersonic flow
   b) An aeroplane is flying at height of 14km. where temperature is -45^0 C. the speed of the plane is corresponding to M=2. Find the speed of the plane if R=287 j/kg.K and γ=1.4 [6M]

8. Air flows through a convergent-divergent nozzle. At some section in the nozzle, Pressure =2 bar, velocity=17 m/s and temperature =200^0C and cross sectional area= 1000 m^2. Assuming isentropic flow conditions determine:[3M+2M+4M+3M] [12M]
   i. Stagnation temperature and stagnation pressure
   ii. Sonic velocity and Mach number at this section
   iii. Velocity, Mach number and flow area at exit (exit pressure= 1.1 bar)
   iv. Pressure, temperature, velocity and flow area at the throat of the nozzle.
   take R=287 kJ/kgK; Cp=1000 J/kgK; ratio of specific heats Cp/Cv = 1.4.

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CODE: 16MPE1004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular & Supplementary Examinations, December-2018
MICROCONTROLLERS AND APPLICATIONS
(Power Electronics And Drives)

Time: 3 Hours Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	What are addressing modes? List and explain different addressing modes of 8051 microcontroller with suitable examples.	6M
	(b)	Explain different data transfer and arithmetic instructions of 8051 microcontrollers.	6M
2.	(a)	Explain the main features of PIC microcontrollers.	4M
	(b)	Discuss the memory organization of PIC microcontroller.	8M
3.		Explain the interfacing of ADC and DAC with 89C51 microcontrollers.	12M
4.	(a)	List out the various interrupts in MCS-51. What is their default priority order? How to change the default priority of MCS-51 interrupts.	6M
	(b)	Briefly explain the timer/counters and their modes in MCS-51.	6M
5.	(a)	Write a program to generate the Sine wave using Atmel processor.	6M
	(b)	Write a program to measure the width of a pulse.	6M
6.		What are the various functional blocks in PIC 16F877? Discuss the architectural features of PIC 16F877.Explain In what way flash memory devices are useful in designing?	12M
7.		Explain the interrupt structure of PIC16F877 indicating all the registers associated with the interrupts.	12M
8.		With a neat sketch explain the interfacing of LED's & LCD's with 89C51 Micro Controllers.	12M

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CODE: 16MCS1004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M.Tech. I Semester Regular & Supplementary Examinations, December-2018

OPERATING SYSTEMS
Computer Science & Engineering

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.		Explain the following commands i)finger ii) umask iii)telnet iv) grep v) comm vi)tar	[12M]
2.	(a)	Explain different control structures in Shell Programming.	[6M]
	(b)	Write a script which checks whether a given file contains a given word. If it does, the script should output the message "The file contains the word"; if not, it should output the message "The file doesn't contain the word."	[6M]
3.	(a)	Describe the process state transition in UNIX environment with the help of a neat sketch.	[6M]
	(b)	Demonstrate the various exit statuses through a program.	[6M]
4.	(a)	Explain the different exec functions in UNIX.	[6M]
	(b)	Explain the following. i) Fork () ii) Vfork ()	[6M]
5.		Explain FIFO, LRU and optimal page replacement algorithms with examples.	[12M]
6.		What is a signal? What is its importance? Elaborate the functions alarm and pause with suitable examples.	[12M]
7.		Elaborate different file allocation strategies in detail.	[12M]
8.	(a)	Explain message queue as an inter-process communication channel?	[8M]
	(b)	Difference between pipes and fifos.	[4M]

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CODE: 16MSE1004 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular & Supplementary Examinations, December-2018

THEORY OF PLATES AND SHELLS

(Structural Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	Mention the assumptions made in the theory of cylindrical bending of long plates and obtain an expression for the flexural rigidity (D) of a plate.	12 M
2.	Derive the governing differential equation for cylindrical bending of uniformly loaded rectangular plates with simply supported edges.	12 M
3.	Explain the boundary conditions for the following end conditions of a plate. (i) Supported edge (ii) Fixed edge (iii) Free edge	12 M
4.	Discuss Navier method for the solution of rectangular plates supported along all four edges and subjected to lateral loads.	12 M
5.	Using Levy's method, determine the expressions for maximum deflections and bending moments in a simply supported rectangular plate.	12 M
6.	Discuss Schorer's theory for the bending analysis of thin circular cylindrical shells and explain its significance.	12 M
7.	Obtain the expressions for stress resultants in the case of elliptic paraboloid for gravity load.	12 M
8.	Explain the stresses in hyperbolic paraboloid shells using membrane theory.	12 M

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Code No: 16MDE1002 SET - 2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMUS)
I M.Tech. I Semester Supplementary Examinations, December-2018

ANALOG AND DIGITAL IC DESIGN
(Digital Electronics & Communication Systems)

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

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

1) a) What is the current mirror? List the applications of current mirrors.

b) Explain with neat sketch Wilson current mirror. Also derive current gain.

2) a) Draw the block diagram of PLL & Explain each block in detail.

b) What are the applications of PLL?

3) a) Explain about parasitic insensitive integrator.

b) Discuss about peak detector using switched capacitor circuit.

4) a) Write VHDL model of 2 to n priority encoder.

b) Write VHDL model of JK Flip-Flop.

5) a) Compare HC, HCT, VHC & VHCT CMOS logic families with the help of output specifications with V_{cc} from 4.5V to 5.5V.

b) Write about CMOS / TTL interfacing.

6) a) With a neat sketch explain about Barrel Shifter.
b) Explain about internal structure of RAM with a neat sketch

7) a) Explain briefly about latched comparators.

b) Write about charge injection errors in comparators.

8) With neat sketches explain the functioning of

a) 4-B it Folded resistor string D/A converters.

b) Integrating type A/D converters.

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CODE: 16MVL1004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Supplementary Examinations, December-2018

DIGITAL IC DESIGN
(VLSI System Design)

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

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	Explain Briefly about how Noise margin and Noise Immunity serve as means for measuring the robustness of digital IC design.	[6M]
	(b)	Explain how Cost of an Integrated Circuit serves as a quality metric for digital IC design.	[6M]
2.	(a)	Explain how the dynamic behaviour of MOS transistor is a function of Intrinsic Capacitances.	[6M]
	(b)	Discuss about the three levels of SPICE Modelling for MOS transistors.	[6M]
3.	(a)	Write about Switching threshold of CMOS inverter.	[6M]
	(b)	Draw the Voltage transfer Characteristics of CMOS inverter and discuss about Noise Margins of CMOS Inverter.	[6M]
4.	(a)	Differentiate TTL and ECL with respect to different Characteristics.	[6M]
	(b)	Explain about the three different abstraction levels of VHDL modelling with an example each.	[6M]
5.	(a)	Write a Behavioural model VHDL code for 1:8 De-multiplexers.	[6M]
	(b)	Draw the ASM Chart for a sequence detector and write a VHDL code for this circuit.	[6M]
6.	(a)	Explain the design process of a Finite State machine with an example	[6M]
	(b)	Explain the problems interfacing CMOS circuits with TTL circuits and how to overcome those problems.	[6M]
7.	(a)	Explain the operation of 8 bit barrel shifter.	[6M]
	(b)	Write a VHDL code describing a JK Flip Flop.	[6M]
8.	(a)	Explain the internal structure of a ROM.	[6M]
	(b)	Describe the I/O block architecture of XC9500 CPLD.	[6M]

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