AR16 **SET-02**

Code No: 16MTE1004

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

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 the rotational and irrotational flow.
   b) Velocity for a two dimensional flow field is given by $V = (3 + 2xy + 4t^2)i + (xy^2 + 3t)j$ Find the velocity and acceleration at a point (1, 2) after 2 sec

2. Derive Hagen-Poiseuille equation and state the assumptions made.

3. a) Explain the characteristics of laminar and turbulent boundary layers
   b) A plate 450mm x 150mm has been placed longitudinally in a stream of crude oil (specific gravity 0.925 and kinematic viscosity of 0.9 stoke) which flows with velocity of 6 m/s. calculate: The friction drag on the plate, Thickness of the boundary layer at the trailing edge and shear stress at the trailing edge.
4. Define and derive displacement ,momentum and energy thickness

5. Obtain an expression for the Prandtl's universal velocity distribution for turbulent flow in pipes why this velocity distribution is called universal?

6. Water is flowing in a rough pipe of 0.5m diameter and 800m length at the rate of 0.5m^3/s. Assuming the average height of roughness as 0.15mm,determine: Coefficient of friction, wall shear stress and center-line velocity and velocity at a distance of 200mm from the pipe wall.

7. Prove that velocity of sound wave in a compressible fluid is given by: C=$\sqrt{\frac{k}{\rho}}$ where, k and ρ are the bulk modulus and density of fluid respectively.

8. a) Explain how a normal shock wave is formed. What is the difference between sound wave and a shock wave? How are oblique shocks formed?
   b) An Aeroplane is flying at an height of 20 km where the temperature is -40^{0}C.The speed of the plane is corresponding to M=1.8.Find the speed of the plane.
   Take γ = 1.4 and R = 287 J/kg.K.

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AR16

CODE: 16MPE1004 **SET-1**

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

MICROCONTROLLERS AND APPLICATIONS
(Power Electronics and Drives)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.		List out some Intel 8-bit and 16-bit Microcontrollers. Draw and discuss the internal architecture of 8051 microcontroller.	12M
2.		What are the interrupts? Discuss different interrupts of 8051 microcontrollers. Also discuss 8051 handles interrupts.	12M
3.		List the salient features of Atmel 89C51 Microcontroller. Also draw and discuss the architecture of Atmel 89C51 microcontrollers.	12M
4.		Explain in detail the architecture of PIC 16F8XX Flash microcontroller, Also discuss their registers.	12M
5.		Differentiate between LCD and LED display. With a schematic, explain the interfacing of LED and LCDs with 89C51 microcontroller.	12M
6.		Explain in what way data EEPROM is useful? Also explain is it possible to access data EEPROM while the PIC is executing instructions.	12M
7.		Explain the interrupt mechanism when the wakes up from the SLEEP mode because of any peripheral interrupt. Which INTCON bits are needed for handling peripheral interrupt and why?	12M
8.	(a)	Explain the Editor, Assembler and Linkers in MCS-51 assembler.	6M
	(b)	Explain the following instructions. i) MOVX ii) XCHD iii) DIV AB iv) ANL	6M

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CODE: 16MVL1004 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

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

DIGITAL IC DESIGN
(VLSI System Design)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	Briefly discuss on what parameter the Cost of the Integrated circuit depends	6M
	(b)	Define Noise Immunity, Directivity and Fan Out	6M
2.	(a)	Explain about Threshold variations and Hot carrier effects on actual MOS transistor	6M
	(b)	Define Logical effort and explain the logical effort for 2 input NAND and NOR gates	6M
3.	(a)	Explain the Static CMOS Inverter with necessary diagrams	6M
	(b)	Write and explain PMOS, NMOS and combined transistor Equations	6M
4.	(a)	Explain the two Input LS-TTL NAND Gate with neat Sketches and write the functional table	6M
	(b)	Write the VHDL Code for adding and subtracting 8-Bit Integers of various types	6M
5.	(a)	Draw the 4 shift registers structure using D flip flop	6M
	(b)	Write the VHDL code for D flip flop with preset and clear using behavioural modelling	6M
6.	(a)	Draw the logic diagram of a 74*138 simple 8*4 diode ROM and explain	6M
	(b)	Explain the timing parameters for read operations in a static RAM	6M
7.	(a)	Explain about Carry look ahead adders with an example	6M
	(b)	Write the Comparisons of SRAM and DRAM	6M
8.	(a)	Explain about Internal structure of synchronous SRAM	6M
	(b)	Draw the Architecture of Xilinx 9500 family CPLDs	6M

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CODE: 16MCS1004 **SET-1**

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

OPERATING SYSTEMS
Computer Science and Engineering

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.		Explain the following commands i)mount ii)umask iii)rlogin iv)sort v)fgrep vi)cpio	[12M]
2.	(a)	Explain the responsibilities of shell in UNIX.	[6M]
	(b)	Write a script called **save** which copies a file into a special directory, and another called **recover** which copies a file back out of the special directory and explain the script.	[6M]
3.	(a)	Explain the steps for creating a process? How can parent and child process share files without ambiguity. Illustrate with an example?	[8M]
	(b)	Mention the differences between process and thread?	[4M]
4.		What is race condition explain with a sample program. What are the methods for eliminating race condition.	[12M]
5.	(a)	Explain the concept of demand paging with example.	[6M]
	(b)	Mention the page replacement algorithms. Explain LRU page replacement algorithm with example.	[6M]
6.	(a)	"Signals provide a way of handling asynchronous events". Justify.	[6M]
	(b)	What are kill and raise signals. Explain how they are handled.	[6M]
7.	(a)	Describe the directory structure in detail.	[6M]
	(b)	Describe FCFS disk scheduling algorithm with a neat sketch?	[6M]
8.	(a)	Create a half-duplex communication channel using pipes.	[6M]
	(b)	How semaphores help in avoiding shared data problem?	[6M]

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CODE: 16MSE1004 **SET-1**

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

THEORY OF PLATES AND SHELLS
(Structural Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	Give a brief account of classification of plates?	4
	(b)	Derive the moment curvature relationship in the case of pure bending of plates?	8
2.		Find Levy's solution for simply supported and sinusoidal loaded rectangular plates?	12
3.	(a)	Derive expressions for strain energy as applicable to plates in bending?	5
	(b)	How do you classify shells into long and short shells as per various theories?	7
4.		Compare the Navier's and Levy's approaches for the solution of rectangular plates?	12
5.		A thin circular plate of radius R is simply supported along r = R. It is subjected to uniformly distributed radial moment M around the rim. Find the deflection of the plate at r=0?	12
6.		Define the membrane state of stress in shells. Derive equations of equilibrium, using membrane theory for cylindrical shell and obtain N_x , N_θ and $N_{x\theta}$?	12
7.		State the assumptions in schorer's theory of cylindrical shells and derive the schorer's differential equation?	12
8.		What are the difference in analysis and design of elliptic paraboloid and hyperbolic paraboloid shells of double curvature by membrane theory?	12

AR16

CODE: 16MDE1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech I Semester Supplementary Examinations, February-2018
ANALOG AND DIGITAL IC DESIGN
(Digital Electronics and Communication Systems)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Consider a simple CMOS current mirror where I_{in}=100µA and each transistor has W/L = 100 µm/1.6µm. Given that $\mu_n C_{ox}$=92µA/V^2,Vtn= 0.8 V and r_{ds}=[8000L(µm)]/I_D (mA)], find r_{out} for the current mirror and the value of the g_{m1} .Also estimate the change in I_{out} for a 0.5 V change in the output voltage.
   (b) Design a Common source Amplifier with a current mirror active load and derive the expression for gain using small signal analysis.

2. (a) Draw the block schematic of a PLL describing the function of each block briefly.
   (b) List out the applications of PLL.

3. (a) Design a low-Q switched capacitor biquad filter and using signal flow graph analysis realize the transfer function.
   (b) Draw parasitic sensitive integrator circuit and discuss how the structure is sensitive to parasitic capacitances.

4. (a) Discuss the different characteristics of digital ICs
   (b) Write a VHDL program for a 3 to 8 decoder in dataflow modelling style.

5. (a) Design a 4 X 4 Barrel Shifter and explain how shifting can be performed.
   (b) Discuss the timing parameters for Read and write Operations in a SRAM.

6. (a) Explain ideal D/A Converter and draw input-output transfer curve for a 2-bit D/A converter.
   (b) Discuss the issues in designing flash A/D converters.

7. (a) Write VHDL program for Binary to Gray Code Converter
   (b) Discuss different types of noise in OPAMPs.

8. (a) Explain the typical architecture of a latched comparator.
   (b) Discuss charge injection errors in comparators

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