

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET  
(AUTONOMOUS)

***M.Tech. I Semester Regular/Supplementary Examinations April - 2013***

***Digital IC Design***

***(Common to Embedded Systems and VLSI System Design)***

**Max. Marks: 60**

**Time: 03 Hours**

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**Answer any five questions**

**All Questions carry equal marks (12 Marks each)**

1. a) Give the brief description about Dynamic CMOS inverter with its equivalent circuit diagram.  
b) Explain the static behavior of the CMOS inverter by evaluating its robustness
2. a) With suitable example, explain the signal integrity issues in dynamic CMOS circuits  
b) Explain combinational circuits with example in detail.
3. a) Explain the different methods of logical efforts in transistor sizing in brief.  
b) Explain about low power CMOS design in detail.
4. a) Explain the simplified models of CMOS-DRAM cell during read and write operations.  
b) Explain the simplified models of CMOS-SRAM cell during read and write operations.
5. a) Explain the static and dynamic behavior of BiCMOS logic circuits.  
b) Describe the delay and power consumption in BiCMOS logic circuits.
6. a) Explain about Sheet resistance and Area capacitance.  
b) Explain the Design rules for the silicon Gate NMOS.
7. a) Describe about Drive Large capacitive load.  
b) Explain the lambda-based design rules.
8. a) Write short notes on implementation of ALU functions with carry-look ahead adder.  
b) Explain the Design consideration of 4-bit shifter in detail.

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*M.Tech. I Semester Regular/Supplementary Examinations April - 2013*

*Embedded System Concepts  
(DECS, ES and VLSI SD)*

Max. Marks: 60

Time: 03 Hours

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Answer *any five* questions

All Questions carry equal marks (12 Marks each)

1. a) Explain the softwares in designing an Embedded system 8M  
b) What is the importance of device drivers? 4M
2. a) Explain different interfacing devices to connect memories and devices in an Embedded system 8M  
b) Write short notes on memory allocation. 4M
3. a) Differentiate OS and RTOS. 4M  
b) Explain function queue scheduling. 8M
4. Discuss the problems in sharing the data in multitask environment. How to overcome the problems 12M
5. Explain the system analysis and system design procedure for designing an embedded system 12M
6. Give the specification details in designing Embedded system. 12M
7. Write short notes on ICE and IDE. 12M
8. Design and develop an Embedded system for digital camera. 12M

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***M.Tech. I Semester Regular/Supplementary Examinations April - 2013***

***FPGA Architectures and Applications***  
***(ES and VLSI SD)***

**Max. Marks: 60**

**Time: 03 Hours**

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**Answer *any five* questions**  
**All Questions carry equal marks (12 Marks each)**

1. a) Write a Short note on P.G.A.  
b) Explain the architecture of cypress FLASH 370 device.
2. Explain FPGA design flow in detail.
3. With a neat sketch explain the architecture of ALTERA's Flex 10K series FPGA in detail.
4. What is finite state Machine (FSM)? Give its Top down design.
5. With an example explain Finite state machine realization.
6. Describe the architecture of centered around non-registered PLD's in detail.
7. Give an example of one-hot design method.
8. Explain the design of parallel adder sequential circuit.

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***M.Tech. I Semester Regular/Supplementary Examinations April - 2013***

***Microcontrollers and Interfacing  
(Embedded Systems)***

Max. Marks: 60

Time: 03 Hours

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**Answer any five questions**

**All Questions carry equal marks (12 Marks each)**

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|-------|---|-----|
| 1. a) | Explain the accessing of memory using various Addressing Modes in 8051  | 6M  |
| b)    | Explain the following Instructions of 8051<br>i)LCALL ii)ACALL iii)LJMP iv) SJMP  | 6M  |
| 2. a) | Explain about the interrupts and their use in 8051 MCU.   | 6M  |
| b)    | Explain the formats of TMOD and TCON special function registers.  | 6M  |
| 3.    | Explain briefly Interfacing of Keyboard to the 8051MCU.   | 12M |
| 4.    | Explain basic operations of electromechanical relay & solid-state relay and describe how to interface them to the 8051. | 12M |
| 5. a) | Explain ADC features in 68HC11 MCU  | 6M  |
| b)    | Explain serial peripheral interface of Motorola 68HC11  | 6M  |
| 6. a) | Explain the CPU architecture of PIC microcontroller   | 6M  |
| b)    | What is an Instruction Pipelining in PIC microcontroller and explain  | 6M  |
| 7. a) | Explain the features of timers in PIC MCU   | 6M  |
| b)    | Explain the serial peripheral interface PIC 16C74 microcontroller   | 6M  |
| 8.    | Explain all the types of ARM and Thumb instructions in ARM MCU  | 12M |

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**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET  
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***M.Tech. I Semester Regular/Supplementary Examinations April – 2013***

***Real Time Operating Systems  
(Embedded Systems)***

Max. Marks: 60

Time: 03 Hours

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**Answer any five questions**

**All Questions carry equal marks (12 Marks each)**

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|-------|--|-----|
| 1. a) | Define a process and explain process control block and properties of parent and child process? | 8M  |
| b)    | What is a message queue and how many message queues will be created for a process              | 4M  |
| 2. a) | Distinguish between Hard and Soft real time systems. Explain briefly periodic Task model.      | 8M  |
| b)    | Explain with example one real time application   | 4M  |
| 3. a) | Explain the term data dependency and Precedence constraints?                                   | 6M  |
| b)    | Explain real time model of reference system?   | 6M  |
| 4. a) | Distinguish between priority driven and Clock driven processes and explain briefly?            | 6M  |
| b)    | Give examples of online and off line scheduling?   | 6M  |
| 5. a) | What is meant by redundancy and how to deduct faults?  | 6M  |
| b)    | Explain what is meant by integrated failure handling?  | 6M  |
| 6. a) | What is meant by Time services and scheduling mechanisms-Explain                               | 8M  |
| b)    | Explain basic function of operating system function and kernel                                 | 4M  |
| 7.    | What is meant by shell programming? List the advantages of Linux over Unix?                    | 12M |
| 8. a) | What is meant by preemptive Priority and semaphore?  | 8M  |
| b)    | Explain watch dogs and its importance in operating system                                      | 4M  |

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**M.Tech. I Semester Regular/Supplementary Examinations April - 2013****VLSI Technology**  
**(Embedded Systems & VLSI Systems Design)**

Max. Marks: 60

Time: 03 Hours

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Answer any five questions

All Questions carry equal marks (12 Marks each)

1. a) Why is the design process carried out in nMOS although CMOS is the dominant technology? Explain.  
b) Sketch the cross sectional view of the following:
  - i) nMOS Enhancement mode transistor.
  - ii) nMOS Depletion mode transistor.
  - iii) pMOS Enhancement mode transistor.
2. In the inverter circuits, what is meant by  $Z_{pu}$  and  $Z_{pd}$ ? Derive the required ratio between  $Z_{pu}$  and  $Z_{pd}$  if nMOS inverter is to be driven from another nMOS inverter?
3. a) What are  $\lambda$ -based design rules? Give them for each layer.  
b) Draw and explain the stick diagram of 2-input CMOS EX-OR gate.
4. a) What are various switch logic circuits? Compare their merits and demerits.  
b) Explain the clocking analysis related to sequential systems.
5. a) What are the various simulators used for combinational logic design? Explain their need.  
b) Explain how the gate placement effects load capacitance in fan-out of combinational logic.
6. a) Draw and explain the cross sectional pair of stacked capacitor DRAM cell.  
b) Distinguish between clock skew and signal skew with an example.
7. a) With relevant diagrams explain any two floor planning methods used in layout design, in brief.  
b) Explain system-on-chip concept using platform based design.
8. Write short notes on any Two:
  - a) Hardware/Software co-design.
  - b) Chip design methodologies
  - c) Testing of sequential circuits.

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