



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/M.Tech(CSE)/SEM-2/CS-1008/2011  
2011**

**MICROPROCESSOR, MICROCONTROLLER AND  
APPLICATIONS**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

Answer any *five* questions.

5 × 14 = 70

1. a) Draw the internal architecture of 8086 microprocessor.  
Define the flags of 8086 microprocessor. 4 + 4
- b) How does 8284A clock generator operates as a reset ? 3
- c) What is the purpose of PCLK and OSC pin of 8284A  
clock generator ? 3
2. a) Describe the effect on the microprocessor and DMA  
controller when the HOLD and HLDA pins are at their  
logic 1 level. 3
- b) What is the function of command registers of 8237 DMA  
controller ? 3

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[ Turn over



- c) Which 8237 DMA controller register is programmed to initialize the controller ? 2
- d) What is the function of mode register ? What do you mean by bus master and bus arbiter ? 3 + 3
3. a) What are Data Direct Addressing mode and Register Indirect Addressing mode ? 3
- b) Define three memory-addressing modes with example. 6
- c) What are Minimum and Maximum mode operation of 8086/8088  $\mu$ P ? 3
- d) List the five flag bits tested by the conditional jump instruction. 2
4. a) Describe how the 80386 switches from real mode to protected mode. 4
- b) What is the task state segment ( TSS ) ? 2
- c) What is a descriptor and how does the selector choose the local descriptor table ? 4
- d) What is the difference between a segment descriptor and a system descriptor ? 4



5. a) Describe the 80386 memory system and operation of the bank selection signal. 4
- b) Define the purpose of each 80386 debug register. The debug register caused which level of interrupt ? 3 + 1
- c) What two additional segment registers are found in the 80386 programming model that are not present in the 8086 ? Define their functions. 3
- d) Describe each 80386 flag register bit and describe its purpose. 3
6. a) What do you mean by far and near call ? Contrast the operation of a JMP DI with a JMP [ DI ]. 4
- b) Write an ALP to calculate the multiplication of two 8-bit numbers which are stored in different memory locations. 5
- c) Write an ALP that sums AX, BX, CX and DX. If a carry occurs, place logic 1 in DI. If no carry occurs, place a 0 in DI. The sum should be found in AX after the execution of your procedure. 5



7. a) What is the memory size of 8051 microcontroller ?  
Which flags are stored in PSW ? What is the address of  
the stack when 8051 is reset ? 3
- b) How can an I/O pin be both an input and output ? 4
- c) How many register banks are used in 8051 and what  
are their addresses ? 3
- d) Discuss about the 16-bit data addressing registers of  
8051 microcontroller. Which register holds the serial  
data interrupt bits  $T_1$  and  $R_1$  ? 4
8. Write short notes on any *two* of the following : 7 + 7
- a) Virtual memory machine
- b) Protected mode memory addressing
- c) Memory paging mechanism.
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