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B. Tech
CPEC 5305

Sixth Semester Examination – 2008

MICROPROCESSOR AND MICROCONTROLLER

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory
and any **five** from the rest.

The figures in the right-hand margin
indicate marks.

1. Answer the following questions : 2×10
- (a) The contents of memory location B0000 are FF and those at B0001 are 00. What is the even-addressed data word stored at address B0000 ?

P.T.O.

- (b) How much memory can be active at a given time in the 8088 microprocessor ?
- (c) What happens to the value in IP each time the 8088 fetches an instruction ?
- (d) For which segment register are the contents of the pointer registers used as an offset ?
- (e) How large is the real-mode address and physical address space of 80386DX MPU ? How large is the protected-mode address and physical address space ?
- (f) Which flag determines whether the address for a string operation is incremented or decremented ?

- (g) If the current values in CS and IP are 0200 and 01 AC respectively, what is the address of the next instruction ?
- (h) A data segment is to be located from address A0000 to AFFFF; what value must be into DS ?
- (i) What are the different operating modes of 82C55A chip ? Which bit of the control register defines one of the two possible modes input/output or BSR ?
- (j) What is virtual 86 mode of 80386 ?
2. (a) How many functional units are there in 8086 processor and what are their functions in achieving pipelining of execution of instructions ?

- (b) What are the differences between maximum and minimum mode operation of a 8086 processor ? 2
- (c) How address is generated using segment-offset approach in 8086 ? 4
3. (a) Write an assembly language program for 8085 microcontroller to create a square wave of 50% duty cycle on bit 0 of port 1. 5
- (b) For an 8051 system of 11.0592 Hz, find how long it takes to execute the following instructions :
- (i) MOV R5, #55
- (ii) NOP 2
- (c) What are the addressing modes of 8051? Give examples. 3

4. (a) In reference to 8086 microprocessor, show how the double word 12345678H will be stored in memory starting at address A001. 3
- (b) Write an assembly language program for 8086 microprocessor to add to vectors containing 10 numbers of data. 7
5. (a) Draw and explain the timing diagram and of the opcode fetch cycle of 8085 microprocessor. 5
- (b) Write an assembly language program for 8085 microprocessor to find the sum of 10 natural numbers. 5
6. (a) Explain logical, linear and physical address spaces of 80386. 4

(b) What do you mean by Effective Address (EA) of an operand in 80386 ? 2

(c) Calculate the linear address of the following instruction. 4

Mov EAX, LOCALTABLE[EDI*4][EBP+80]

7. (a) Give a schematic diagram how can you interface an EPROM(2764) to a 8085 microprocessor through a 8255 chip. 5

(b) Draw a flow chart for loading data into EPROM. 5

8. (a) Explain DMA mode of data transfer. What DMA controller chip is used for this data transfer. Give a schematic diagram for DMA mode of data transfer in reference to 8086 microprocessor. 5

(b) What is the difference between interrupt driven and polled I/O methods of data transfer ? $2\frac{1}{2}$

(c) Give a schematic diagram showing interfacing of programmable interrupt controller to 8086 processor. $2\frac{1}{2}$