

THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY
END SEM EXAMINATION (JULY-DEC 2006)
B.E. Final Year (Computer Science)

Subject: Microprocessors (EC-007)

Max. Marks: 36

Time: 3 hour

NOTE: Attempt any five questions. Question 1 is compulsory. Assume any missing data, if required.

1. (a) The temperature of two furnaces being monitored by a microprocessor. A set of five readings of the first furnace, recorded by five thermal sensors, is stored at the memory location starting at XX50H. A corresponding set of five readings from the second furnace is stored at the memory location starting at XX60H. Each reading from the first set is expected to be higher than the corresponding reading from the second set. Write an 8085 program to check whether each reading from the first set is higher than the corresponding reading from the second set. If all the readings from the first set are higher than the corresponding reading from the second set, turn on the bit Do of the output PORT1. If any one of the readings of the first set is lower than the corresponding reading of the second set, stop the process and output FF H as an emergency signal to the output PORT1. (4)
1. (b) Write a program sequence using 8086 instruction set that will test the byte STATUS and branch to ROUTINE_1 if bit 1,2 or 4 is 1. Otherwise, it is to branch to ROUTINE_2 if both bits 1 and 3 are 1 and to ROUTINE_3 if both bits 1 and 3 are 0. In all other cases it is to execute ROUTINE_4. Assume that the routines are more than 128 bytes long. Also give a flowchart of the sequence. (4)
2. (a) A system is designed to monitor the temperature of a furnace. Temperature reading are recorded in 16 bits and stored in memory locations starting at XX60 H. The higher order byte is stored first and low-order byte is stored in the next consecutive memory location. However, the high-order byte of all the temperature reading is constant. Write a 8085 program to transfer low-order readings to consecutive memory locations starting at XX80H and discard the higher order bytes. (4)
2. (b) Explain the concept of segmented memory in 8086. Also list the advantages of it. (3)
3. (a) Write a 8086 program to count continuously from 0 to 99 in BCD with a delay of 750 ms between each count. Display the count at an output port. (3)
3. (b) Write an 8086 assembly language program that compares a password entered by a person who wants to use the computer with the correct password stored in memory. If the password does not match, it sounds an alarm; otherwise continue to the mainline program. Also give a flowchart of the sequence. (4)
4. (a) Draw and explain the schematic of 8086 in minimum mode. (4)
4. (b) Write a 8085 program to control a railway crossing signal that has two alternating flashing red lights, with a 1- second delay ON-time for each light. (3)
5. (a) Draw the interfacing circuit to interface 8085 μ P with 4 KB 2732 EPROM memory chip. Also identify the memory map for this chip. (3)
5. (b) List and describe in general terms the steps an 8086 microprocessor will taken when it responds to an interrupt. Address 00080H in the interrupt jump table contains 4A24H, and address 00082H contains 0040H. To what interrupt type do these locations correspond? What is the starting address for the interrupt service procedure? (4)
6. (a) Draw the block diagram of 8255A and explain its working in BSR mode. (4)
6. (b) Draw and explain the block diagram of 80286. (3)

NOTE: Students can see their evaluated answer sheets on 11/12/2006 at 12:30 PM in C-104.