CLASS: BE   SEMESTER : IV
BRANCH: ECE   SESSION : SP/19

SUBJECT: EC4205 MICROPROCESSORS AND MICROCONTROLLERS

TIME: 3 Hours   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
4. **Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Why the TMP Register is connected bidirectional to the Internal data bus in 8085?   [2]
Q.1(b) Explain the function of the following signals of 8085: a) ALE, b) Reset out, c) Ready and d) Hold.   [4]
Q.1(c) A block of binary bytes resides in locations starting from ARRAY and the count of bytes(in BCD) is given   [6]
        in location BINCOUNT. Write an 8085 based program to arrange them in descending order in the same
        locations.

Q.2(a) Write two instructions which require a read memory operation and a write memory operation in their   [2]
        Execution cycles (only one Read memory and one Write memory).
Q.2(b) What does DAA instruction do in 8085? Demonstrate the operation of DAA with a suitable examples.   [4]
Q.2(c) Six unpacked BCD members are residing in 6 locations starting from BCD. Write an 8085 based program   [6]
        to form the smallest 6-digit BCD number which can be formed by them and store the BCD number in 3
        locations starting from BCDNUM.

Q.3(a) How does an 8085 respond to an interrupt request at INTR pin? Elaborate with the help of relevant   [2]
        diagrams.
Q.3(b) Show with the help of diagram how to interface a 4K RAM with an 8085, with starting address from   [4]
        4000H.
Q.3(c) Write a program to count the number of pulses arriving at SID pin of an 8085. The count shall be in BCD, [6]
        and the maximum number of pulses can be only 99.

Q.4(a) Demonstrate the Input Handshaking procedure of 8255, with the help of relevant timing diagrams.   [2]
Q.4(b) Explain the following terms with respect to a Digital to Analogue Convertor: [4]
        a) Absolute Accuracy, b) Relative Accuracy, c) Settling Time and d) Monotonicity.
Q.4(c) Write an 8085 based program to collect 150 samples of a signal at intervals of 10m sec and store them   [6]
        in locations starting from DATA. For logic 1, the switch is closed and for logic 0, the switch is open.
        Acquisition time is 4μ sec. Use PC_1 for Logic, PC_0 for SOC and PC_7 of 8255 for EOC. Collect the digitized
        samples through Port A of 8255. (Assume time delay programs are available).

Q.5(a) Distinguish between Software triggered strobe and Hardware triggered strobe (with neat timing   [2]
        diagrams) in an 8253 timer.
Q.5(b) Write a program to display and flash **123456** in an SDK-85 kit.   [4]
Q.5(c) Write an 8085 based program to design a real time clock, which will count up to 1 hour. Once an hour   [6]
        is over, the count has to be stopped. Use 8253 Timer 1 to interrupt the CPU at a rate of 200 times per
        second. Clock frequency is 2 MHz. Gate of Timer 1 is connected to PC_0 of 8255. Out 1 of 8253 is
        connected to RST 6.5 interrupt.

Q.6(a) Why ROM is mapped to the higher regions of the memory map and RAM is mapped to lower regions of   [2]
        the memory map in an 8086 based system?
Q.6(b) Explain the function of the following signals in an 8086 microprocessor: [4]
        a) MN/MX , b)TEST   c) LOCK   d)DEN
Q.6(c) Differentiate between CISC and RISC, stating the salient features of RISC.   [6]

Q.7(a) What is meant by Special Function Registers in an 8051 microcontroller?   [2]
Q.7(b) What are the salient features of an 8051 microcontroller?   [4]
Q.7(c) Explain any six addressing modes of an 8051 microcontroller.   [6]

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