CBCS SCHEME

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17EC46

Fourth Semester B.E. Degree Examination, Jan./Feb. 2021
Microprocessors

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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Module-1

1 a. Draw and explain the internal architecture of 8086 microprocessor. **(10 Marks)**
b. Explain the concept of segmented memory. What are its advantages? **(06 Marks)**
c. If (CS) = 2000H, (DS) = 1234H, (SS) = 5678H, (BP) = 09ABH, calculate the physical address generated by the microprocessor when the following instruction is executed: MOV AL, [BP + 55H]. **(04 Marks)**

OR

2 a. With one example for each, describe any five addressing modes of 8086, used to access the data present in memory. **(10 Marks)**
b. List out any six conditional branch instruction that work based on the condition of any one flag. Mention the flag corresponding to each instruction. **(06 Marks)**
c. With numerical examples, illustrate the use of CBW and CWD instructions. **(04 Marks)**

Module-2

3 a. List out the five string manipulation instructions of 8086 and explain the operation of each. **(10 Marks)**
b. Write an Assembly Language Program (ALP) to add the data word located at address 2000H : 0500H to another data word available at offset 0600H in the same segment, and store the result and carry starting at 0700H in the same segment. **(06 Marks)**
c. With numerical examples, bring out the difference between SAR and SHR instructions. **(04 Marks)**

OR

4 a. Write an ALP using assembler directives to convert a 4-digit packed BCD number into equivalent 16-bit binary number, and store the result in memory. Write comments in your program. **(10 Marks)**
b. Explain the following instructions with one example each: RCR, XOR, SAHF. **(06 Marks)**
c. State the difference between the following two instructions: AND, TEST. What is the use of these instructions? **(04 Marks)**

Module-3

5 a. Explain the structure of stack in 8086 microprocessor. What is the role of stack during CALL and RET instructions? Illustrate with example. **(10 Marks)**
b. Explain any three methods of passing the parameters to and from a procedure. **(06 Marks)**
c. What is a macro? Give any two differences between macro and procedure. **(04 Marks)**

OR

6 a. Draw the interrupt vector table of 8086 and explain how an interrupt request is serviced, taking the example of type N interrupt. **(10 Marks)**

b. Write an ALP to generate a time delay of 10 seconds using an 8086 system that runs on 10MHz frequency. **(06 Marks)**

c. Bring out any four differences between maskable and non-maskable interrupts. **(04 Marks)**

Module-4

7 a. With a neat diagram, explain the maximum mode 8086 system. **(10 Marks)**

b. Write the functions of the following signals of 8086 : i) ALE ii) $\overline{DEN}$ iii) $\overline{BHE}$. **(06 Marks)**

c. Draw the minimum mode read cycle timing diagram, and explain briefly. **(04 Marks)**

OR

8 a. Design an interface between 8086 and two ICs of 32KB RAM and two ICs of 16KB EPROM. The RAM address must start at 00000H, and the EPROM address must end at FFFFFH. **(10 Marks)**

b. Draw the internal architecture of 8255 PIO and explain in brief. **(06 Marks)**

c. Explain Mode-1 and BSR modes of 8255. **(04 Marks)**

Module-5

9 a. Interface ADC 0808 with 8086 CPU using 8255 ports. Use port A for transferring digital data of ADC to CPU, and port C for control signals. Assume that analog input is present at input-3 of ADC. Draw the schematic and write the required ALP. **(10 Marks)**

b. Interface DAC0800 with 8086 CPU using port B of 8255. Write an ALP to generate a triangular waveform of frequency 400Hz. Assume that the system operates at 8MHz and the amplitude of the wave is 5V. **(10 Marks)**

OR

10 a. Write an ALP to read a 2-digit hexadecimal number from keyboard, and display its 4-digit square value on the computer screen, using appropriate DOS function calls. Use assembler directives and comments in your program. **(12 Marks)**

b. Write short notes on Von-Neumann architecture and Harvard architecture of computers with neat block diagrams. **(08 Marks)**

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