2024

COMPUTER SCIENCE — HONOURS

Paper : CC-10

(Microprocessor and its Application)

Full Marks : 50

The figures in the margin indicate full marks.

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

Answer ***question no.*** **1** and ***any four*** questions from the rest.

1. Answer ***any five*** questions : 2×5

(a) Which interrupt in the microprocessor 8085 is non-maskable? What is its purpose?

(b) What is the purpose of the IN and OUT instructions in the microprocessor 8085?

(c) What does the instruction 'NOP' do in the microprocessor 8085?

(d) What is the function of the RST (Restart) instruction in the microprocessor 8085? Give examples.

(e) Name the different addressing modes of microprocessor 8085. Give examples.

(f) What is the function of the READY signal in the microprocessor 8085?

(g) How can we send data out of microprocessor 8085 serially using SOD pin? Give examples.

(h) What is the purpose of the Stack Pointer (SP) in the microprocessor 8085?

2. (a) How does the microprocessor 8085 execute branch instructions? Provide examples of conditional and unconditional branch instructions.

(b) Explain the function of the instructions DAA and XCHG associated with microprocessor 8085. (3+3)+(2+2)

3. (a) Draw the timing diagram of the instruction STA 8000_H, assuming that the instruction is written across the memory locations F000H, F001H and F002H. The opcode of STA is 32H.

(b) Create an appropriate logical circuit diagram to illustrate the generation of control signals in the microprocessor 8085. 6+4

4. (a) Discuss the role of the Address Latch Enable (ALE) signal in the microprocessor 8085. How does it help in the de-multiplexing of lower order address data bus AD_0 to AD_7? Explain with suitable illustrations.

(b) Explain the function of the two DMA signals HOLD and HLDA. (2+2+3)+3

5. (a) Describe the role of the flag register in the microprocessor 8085. What are the different flags, and how do they affect the execution of instructions?

(b) What are the different hardware and software interrupts? Explain with suitable example. 6+4

6. (a) Explain direct addressing in microprocessor 8085 with suitable examples.

(b) Interface a 2-kilobyte memory module to the microprocessor 8085 within the memory range of 8000H to 87FFH. Provide a suitable circuit diagram to illustrate this interfacing. 4+6

7. (a) Draw the Internal architecture of microprocessor 8085 and explain in brief its various functional blocks.

(b) What are the instructions used to access data from the Ports in I/O mapped I/O method in microprocessor 8085? Explain with examples. 7+3

8. (a) Describe the control word format of the Programmable Peripheral Interface (PPI) 8255 and determine the control word needed to configure Port A and Port C as input ports and Port B as an output port, operating in Mode-0.

(b) Explain nesting of subroutines with suitable example and illustrations.

(c) Explain the operation of the following assembly language program for microprocessor 8085. Show all the steps and the register contents after execution of each instruction.

```
MVI A, 32H
LXI H, 8000H
MOV M, A
MVI B, 80H
XRA A
MOV C, A
STAX B
HLT
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2+(2+2)+4