2025

COMPUTER SCIENCE — HONOURS

Paper : DSCC-6

(Microprocessor and its Applications)

Full Marks : 75

The figures in the margin indicate full marks.

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

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

(a) What is the purpose of READY signal with respect to microprocessor 8085?

(b) Which operations are performed by the Arithmetic Logic Unit (ALU) of the 8085 Microprocessor?

(c) How many hardware interrupts 8085 supports? Name the hardware interrupts.

(d) What are opcode and operand?

(e) Explain the software instructions EI and DI.

(f) What is the function of ALE and how does it function?

(g) Explain the function of the two DMA signals HOLD and HLDA.

(h) What is the maximum addressable memory capacity of the 8085 microprocessor? Provide a justification based on its architectural constraints.

Answer ***any three*** questions.

2. Describe the address-data bus demultiplexing process in the 8085 Microprocessor with an appropriate diagram. 5

3. Describe how control signals are generated in the 8085 Microprocessor to enable separate access to memory and I/O devices. Draw suitable diagram. 5

4. What is the maximum number of input and output ports supported in the I/O mapped I/O scheme in 8085 Microprocessor? Describe the operations performed by the IN and OUT instructions using 8-bit addressing. 1+4

5. Compare I/O mapped I/O and memory mapped I/O in the context of the 8085 microprocessor, highlighting their key differences. 5

6. Differentiate between RAR and RRC instructions with examples. 5

Answer ***any five*** questions.

7. Draw the internal architecture of Microprocessor 8085 explaining each section in brief. 5+5

8. (a) What will be the content of Accumulator of microprocessor 8085 after the execution of XRA A? Justify your answer.

(b) Are the JMP 16-bit address and PCHL instruction equivalent in functionality in the 8085 microprocessor? Justify your answer with an appropriate example.

(c) What is stack? Explain the instruction related to stack operation. 2+3+5

9. What are the different general purpose and special purpose registers available in Microprocessor 8085? Explain each with suitable examples. 5+5

10. Define the term 'interrupt'. Distinguish between hardware and software interrupts in the context of the 8085 Microprocessor. Describe how the RST 5 instruction (Opcode – EFH) can be inserted onto the data bus using a suitable hardware implementation. 3+3+4

11. What are the different status flags in Microprocessor 8085? Explain each with suitable example. 3+7

12. Demonstrate the interfacing of the Programmable Peripheral Interface (PPI) 8255 with the 8085 Microprocessor using the I/O-mapped I/O method. Assign port addresses as specified : 6+4

Name of Port	Port Address	Remarks
Port-A	80H	Physical address of Port-A of 8255
Port-B	81H	Physical address of Port-B of 8255
Port-C	82H	Physical address of Port-C of 8255
CWR	83H	Physical address of CWR of 8255

13. Analyze the contents of registers after the execution of each instruction in the 8085 Assembly Language Program. 10

```
      LXI H 3000H
      MVI M, 32H
      MOV B, M
      XRA A
      MOV A, B
      ORA B
Back : DCR B
      JNZ Back
      HLT
```

14. Write in short on the following (***any two***) : 5+5

(a) BSR mode of PPI 8255

(b) Draw the timing diagram of Opcode fetch operation.

(c) Explain the instruction SHLD, 16-bit address and LDAX B with suitable example.

(d) Non-markable Interrupt.
