

MCS–012

BACHELOR OF COMPUTER APPLICATION (BCAOL)
COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE
PROGRAMMING

Time: Three Hours

Maximum Marks: 100

Note: This paper has three Sections. Attempt five questions each from Section A and Section B and two questions from Section C.

Section–A (Short Answer)

Note: Attempt any five questions from this Section. Each question is of 4 marks.

1. List any four common interrupts and conditions that cause those interrupts.
2. Draw and explain truth table and logic diagram for a 4×1 multiplexer.
3. A memory unit has a capacity of $16 \text{ K} \times 16$:
 - a) How many data input and data output lines does it has?
 - b) How many address lines does it has?
4. The seek time of a disk is 50 milliseconds. It rotates at the speed of 6000 rotations per minute. Each track of the disk has 100 sectors. What is the access time of the disk?
5. Define the register addressing and register indirect addressing schemes with the help of one example each.
6. What are the advantages of using large register file in RISC architecture?

7. Explain the use of AAA (ASCII adjust after addition) instruction of 8086 microprocessor with the help of an example.

Section-B (Medium Answer)

Note: Attempt any five questions from this Section. Each question carries 10 marks.

8. Write and explain a program using 8086 assembly language that finds the maximum and minimum value in an byte array of size 10, stored in the memory.

You may assume that the byte array stores unsigned numbers.

9. Explain the role of segment registers in 8086 micro-processor. Compute the physical address for the following (all addresses are in hexadecimal):

i) Find the physical address of top of the stack, for

SS = 5962 H and SP = 0519H.

ii) Find the physical address of a data byte for which

DS = 4756H and Offset is 0200H.

iii) Find the physical address for an instruction for which

CS = 49AAH and IP = 4572H .

10. Explain the functioning of Wilkes control unit. What is the role of control memory in micro-programmed control unit? Explain the organization of control memory.

11. Explain the functioning of the following instructions with the help of an example of each:

i) Unconditional Branch

ii) Subroutine call

iii) Return from a subroutine

iv) Logical shift left instruction

12. What is programmed I/O? Explain with the help of an example how is programmed I/O different from Direct Memory Access (DMA)? Explain the functions of DMA.

13. What is the need of cache memory in a computer? Explain the set associative mapping of Cache.

14. a) Explain the functioning of master-slave flip-flop.

b) Use the Karnaugh's map simplification to simplify the following function:

$$F(A, B, C, D) = \Sigma (0, 1, 2, 5, 6, 7, 12, 13, 14)$$

Section-C (Long Answer)

Note: Attempt any two questions from this Section. Each question carries 15 marks.

15. Perform the following data conversions:

a) Decimal 129.25 binary

b) Hexadecimal $(ABF)_{16}$ to decimal

c) Hexadecimal $(BAFD)_{16}$ to octal

d) Decimal 25.125 to IEEE 754 single precision floating point number

e) Decimal 567.28 to BCD

16. Differentiate between the following:

a) Assembly language programming and machine language

b) Move instruction and exchange instruction of 8086 micro-processor

- c) RISC architecture and CISC architecture.
 - d) Relative addressing scheme and Base register addressing scheme
 - e) Serial external interfaces and parallel external interface in a computer.
17. Explain the following with the help of a diagram/example, if needed:
- a) Storage format on CD-ROM
 - b) Memory interleaving
 - c) Instruction pipelining
 - d) Parity bit
 - e) Von Neumann machine