Roll No. : .....

Total No. of Questions : **16**] [Total No. of Printed Pages : **3**

COMPSEM–124

M.Sc. (Ist Semester) Examination, Dec., 2022

COMPUTER SCIENCE

Paper – MSC–CS–CC–103

(Computer Organization)

*Time : **3** Hours*] [*Maximum Marks : **40***

The question paper contains three Sections.

Section–A **(Marks : 1 × 10 = 10)**

Note :– Answer all *ten* questions (Answer limit **50** words). Each question carries **1** mark.

Section–B **(Marks : 3 × 5 = 15)**

Note :– Answer any *five* questions by selecting at least *one* question from each Unit (Answer limit **200** words). Each question carries **3** marks.

Section–C **(Marks : 5 × 3 = 15)**

Note :– Answer any *three* questions by selecting *one* question from each Unit (Answer limit **500** words). Each question carries **5** marks.

Section–A

1. (i) Divide 0110111_2 by 011_2.

   (ii) What do you mean by Processor ?

(iii) Define the concept of Bits and Bytes.

(iv) Explain Booth's Algorithm.

(v) What is half adder circuit ?

(vi) Explain working of I/O Processor.

(vii) How I/O interface works ?

(viii) Explain Memory Hierarchy.

(ix) Define Bus system in 8085 Microprocessor.

(x) Write different Register set of 8085 Microprocessor.

Section–B

Unit–I

2. Explain difference between organization and architecture of Computer.

3. Perform the following conversion :

   (a) $(101100.1010)_2 \rightarrow (\ )_{10}$

   (b) $(3269)_8 \rightarrow (\ )_{16}$

   (c) $(9FC3)_{16} \rightarrow (\ )_{10}$

4. What is 1's complement and 2's complement ? Also write difference between 1's and 2's complements. Convert the decimal number 45 to 2's complement.

Unit–II

5. What is Multiplexer ? Draw 8 * 1 multiplexer.

6. Explain the various mode of data transfer. Explain DMA controller with diagram in detail.

7. Draw and explain cache organization. Explain the replacement algorithm for cache memory.

Unit–III

8. Explain timing and control unit of Intel 8085 Microprocessor.

9. Explain addressing modes of 8085 Microprocessor.

10. Define all interrupts and control pins of 8085 Microprocessor.

Section–C

Unit–I

11. What do you mean by Universal Gate ? Prove that NAND Gate is Universal Gate.

12. Solve the following using K map :

$$Y = \Sigma(0, 2, 5, 7, 8, 10, 13, 15)$$

Unit–II

13. What do you mean by Flip-flop ? Explain the working of J-K Flip-flop.

14. What is the need of virtual memory in Computer System ? Explain how the page map table is organized in virtual memory system.

Unit–III

15. Draw the block diagram of architecture of 8085 Microprocessor. Explain each components of its architecture.

16. Explain opcode, word size and instruction cycle with reference to 8085 Microprocessor.