OCAME/D-20 **24034**

COMPUTER ORGANIZATION

Paper–MCA-14-12

Time allowed : 3 Hours   *Maximum Marks : 80*

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All question carry equal marks.

Compulsory Question

1. Answer the following questions in brief: 4×4=16

    (a) Differentiate between encoder and decoder.

    (b) Explain multi-byte data organization.

    (c) Differentiate between vertical and horizontal microinstruction format.

    (d) Differentiate between hardwired and microprogrammed control unit.

UNIT-I

2. (a) Minimize the following function in SOP to minimal form using k-Maps: 8

   $f = m(1, 5, 6, 11, 12, 13, 14) + d(4)$ where d is don't care condition.

   (b) What is subtractor? Design full subtracter with the help of two half subtracters and logic gate. 8

3. (a) What do you mean by shift register? Explain the various types of shift registers. 8

   (b) What is comparators? Design 4-bit magnitude comparator. 8

UNIT-II

4. (a) What do you mean by bus? What are three different types of system buses? Explain. 8

   (b) Explain the various arithmetic and logical micro-operations with the help of suitable, examples. 8

5. (a) Explain the internal organization of CPU with the help of its block diagram. 8

(b) How can you specify the behaviour of D-flip-flop using RTL? Explain. 8

UNIT-III

6. (a) How can you design the hardwired control unit? Explain. 8

(b) How to add and subtract floating-point numbers? Explain with the help of flowchart. 8

7. Explain the following:
(a) Microinstruction formats 8
(b) Booth's algorithm for multiplication 8

UNIT-IV

8. (a) Explain the hierarchical memory systems with the help of suitable diagram. 8

(b) What is asynchronous data transfer? Explain the source-initiated data transfers in detail. 8

9. (a) What is DMA? Draw its block diagram. What are the different modes of DMA data transfer? Explain. 8

(b) What is virtual memory? How to implement virtual memory using segmentation? Explain with the help of diagram. 8