Roll No. .....

MCA/D09 **5417**

Computer Organization

Paper: MCA-102

Time: Three Hours Maximum Marks: 80

Note:- Attempt **FIVE** questions in all Question No.**1** is compulsory and attempt **FOUR** more questions by selecting **ONE** question from each unit.

1. Answer the following questions in brief:

(a) Distinguish between micro and macro operations, machine instruction and micro instruction.

(b) Why can not you connect I/O devices directly to a system bus?

(c) A computer system has 64KW main memory with 16-bit word. Find the size of address decoder, MAR and MBR.

(d) Write the address format of a Hard Disk and define seek time, latency time and transfer time.

(e) Why NOR gate is called a universal gate?

(f) Represent 987 in ASCII, EBCDIC and Excess-3 BCD codes.

(g) Convert 3x8line decoder into full subtractor.

(h) Convert 23.2 in octal into base 3 and 7. 24

UNIT-I

2. (a) Represent $(-239.1)_{10}$ in single precision IEEE-754 format. Also write special values represented in this format. 7

(b) Design a single-error detecting and single error correcting Hamming code for 101001101. Also show how an error is automatically corrected in this code. 7

3 (a) Simplify $F(A,B,C,D) = \Sigma(0,2,5,8,9,10,12,13)$ by Quine McCluskey and K-Map methods. 7

(b) Perform 17_{10}-39_{10} in 1's and 2's complement. Why 2's complement is preferred over 1's complement in a computer system? 7

UNIT-II

4. (a)Define Half Adder (HA) and Full Adder(FA). Draw their truth table. Design FA using two has and one OR gate. 8

(b) Design an Excess-3 to 8421 BCD code converter using 4-bit parallel binary adder. 6

5. (a)Define decoder and demultiplexer. Construct a 5*32 decoder with four 3*8 decoder/demultiplexer and 2*4 decoder. 7

(b)What is BCD adder? Design a BCD adder. 7

UNIT-III

6. (a) What is JK flip-flop? Explain its working with the help of its characteristics table. Write its excitation table. What is racing problem in it? How is that eliminated? 7

(b) Using JK flip=flops design a 4-bit module-10 counter. 7

7 (a) What is static binary cell? Explain read and write operations on it. Use it to organize a 16*4 2D RAM and explain read and write operations. 8

(b) Explain different types of ROM memories. 6

UNIT-IV

8	(a) What is instruction format? What are the factors that affect the design of an instruction format? Explain zero and one address instruction formats with example.	7
	(b) Explain immediate, implied and register indirect addressing modes.	7
9	(a) What is interrupt? Explain daisy chain and polling interrupt structure.	7
	(b) Explain the working of DMA with the help of a suitable diagram.	7