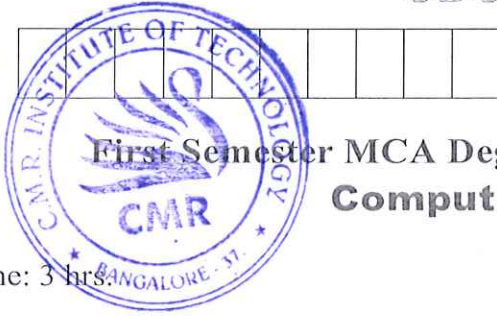


CBCS SCHEME

USN



18MCA15

First Semester MCA Degree Examination, June/July 2019 Computer Organization

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Convert the decimal number 250.5 to binary, octal and hexadecimal. (05 Marks)
- b. Convert the following numbers from the given base to the base indicated.
 - i) Binary 11010111.110 to decimal, octal and hexadecimal. (04 Marks)
 - ii) Octal 623.77 to decimal, binary and hexadecimal. (04 Marks)
- c. Obtain 1's and 2's complement of the binary numbers 1010101, 0111000 and 10000. (03 Marks)
- d. Perform the subtraction of the following binary numbers using 2's complement and 1's complement.
 - i) 11010 - 1101
 - ii) 10010 - 10011 (04 Marks)

OR

- 2 a. State axiomatic definition of Boolean algebra. (05 Marks)
- b. Express the Boolean function $F = A + B'C$ in sum of minterms and product of maxterms. (05 Marks)
- c. Simplify the following Boolean function using map method.
 - i) $F(x, y, z) = \sum(0, 2, 4, 5, 6)$
 - ii) $F(w, x, y, z) = \sum(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$. (04 Marks)
- d. Implement the function $F(x, y, z) = \sum(0, 6)$ using i) NAND gates and ii) NOR gates. (06 Marks)

Module-2

- 3 a. With a neat block diagram, explain half adder and full adder. (06 Marks)
- b. Explain 4 bit binary parallel adder with look ahead carry generator. (06 Marks)
- c. With a logic diagram, explain magnitude comparator. (04 Marks)
- d. What is demultiplexer? Explain briefly. (04 Marks)

OR

- 4 a. Implement the function $F(A, B, C, D) = \sum(0, 1, 3, 4, 8, 9, 15)$ with a multiplexer. (04 Marks)
- b. With a neat logic diagram, explain clocked RS flip flop. (06 Marks)
- c. Explain JK flip flop. (06 Marks)
- d. With an example explain Booth algorithm. (04 Marks)

Module-3

- 5 a. With a neat block diagram, explain the functional units of a computer. (06 Marks)
- b. With an example explain basic instruction types. (06 Marks)
- c. With an example explain branching. (08 Marks)

OR

- 6 a. With an example explain the, different addressing modes. (12 Marks)
b. Write a brief note on the following:
i) Assembler directive
ii) Basic input / output operations. (08 Marks)

Module-4

- 7 a. What is an interrupt? Briefly explain. (05 Marks)
b. Write a brief note on the following:
i) Exceptions
ii) Direct memory access
iii) Bus arbitration. (15 Marks)

OR

- 8 Write a brief note on the following:
a. Accessing I/O devices
b. Interrupt Nesting
c. Synchronous bus
d. Asynchronous bus. (20 Marks)

Module-5

- 9 a. With a neat diagram, explain the internal organization of memory chips. (07 Marks)
b. With a block diagram, explain CMOS memory cell. (07 Marks)
c. With a neat diagram, explain dynamic RAM. (06 Marks)

OR

- 10 Write a brief note on the following :
a. Read only memory
b. Speed, size and cost of memories
c. Cache memories
d. Virtual memories. (20 Marks)
