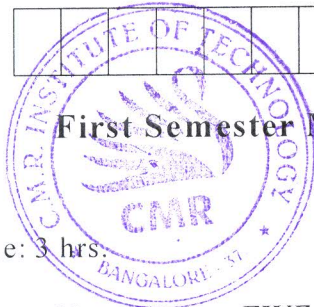


CBCS SCHEME

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16/17MCA14



First Semester MCA Degree Examination, Dec.2018/Jan.2019 Computer Organization

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Convert the following numbers into different bases:
i) $(11011)_2 = (?)_{10}$ ii) $(11010.11)_2 = (?)_{10}$ iii) $(1010101)_2 = (?)_8$
iv) $101011_2 = (?)_{16}$ v) $(B8)_{16} = (?)_{10}$ (05 Marks)
- b. Subtract using 1's and 2's complement:
i) 10110_2 ii) 11010_2 iii) 10011_2
 -110_2 -10000_2 11101_2 (06 Marks)
- c. For 8 4 2 1 code write corresponding excess-3 code and 2 4 2 1 code. (05 Marks)

OR

- 2 a. State and prove De' Morgan's theorem. (04 Marks)
b. Simplify using K-map and design a logic circuit diagram for the following Boolean function (06 Marks)
 $F(A, B, C, D) = \sum 1, 2, 3, 9, 10, 11, 12, 13, 14, 15.$
c. Design a logic circuit diagram for an odd parity generator for a 3-bit information. (06 Marks)

Module-2

- 3 a. Design a full-adder circuit. (06 Marks)
b. Design a 3-8 decoder. (05 Marks)
c. Perform $13 \times (-6)$ using Booth's multiplication. (05 Marks)

OR

- 4 a. Design D-flip-flop, and T-flip-flop using J-K flip-flop. (06 Marks)
b. Design a 4-bit ripple counter and write the count sequence. (10 Marks)

Module-3

- 5 a. Explain with the help of block diagram a single-bus structure. (04 Marks)
b. Explain the basic operational concepts of a digital computer with the help of a block diagram. Show the internal components. (06 Marks)
c. What are the different types of instructions? Classify them according to their functionality. (06 Marks)

OR

- 6 a. Discuss the different types of condition codes. (06 Marks)
b. Discuss the different addressing modes. (10 Marks)

Module-4

- 7 a. Differentiate between program controlled I/O and interrupt I/O. (05 Marks)
b. Explain the structure of various registers used in key-board and display devices. (05 Marks)
c. With the help of a block diagram explain the concept of daisy chain. (06 Marks)

OR

- 8 a. With the help of block diagram explain the operation of a DMA controller. (08 Marks)
b. Explain centralized bus arbitration. Also show the sequence of signals in transfer a bus mastership for the devices. (08 Marks)

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- 9 a. Explain the following: i) ROM ii) PROM iii) EPROM. (06 Marks)
b. Explain the memory hierarchy. (04 Marks)
c. With respect to cache memory organization explain associative mapping. (06 Marks)

OR

- 10 a. What do you mean by virtual memory concept? Explain paging technique. (08 Marks)
b. Why do we need secondary storage? Explain the magnetic hard disk technology. (08 Marks)

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