CBCS SCHEME

USN | | | | | | | | | | |

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) $10110_2 - 110_2$ ii) $11010_2 - 10000_2$ iii) $10011_2 - 11101_2$ **(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' Mongan's theorem. **(04 Marks)**

b. Simplify using K-map and design a logic circuit diagram for the following Boolean function $F(A, B, C, D) = \sum 1, 2, 3, 9, 10, 11, 12, 13, 14, 15$. **(06 Marks)**

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 × (-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)**

Module-5

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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