USN

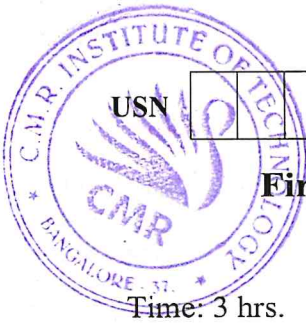**18MCA15**

First Semester MCA Degree Examination, Aug./Sept.2020
Computer Organization

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1   a. Convert the following :
   i) $(1111.11)_2 = (?)_{10}$ ii) $(7654.4081)_8 = (?)_{10}$ iii) $(EC.12)_{16} = (?)_8$
   iv) $(355.22)_8 = (?)_{16}$ v) $(306.D)_{16} = (?)_2$.   **(10 Marks)**

   b. Solve using r's complement.
   i) $(82.734)_{10}$ ii) $(0.8823)_{10}$ iii) $(47480)_{10}$ iv) $(0.9292)_{10}$ v) $(0.4565)_{10}$.   **(05 Marks)**

   c. Subtract using r's complement.
   i) $72532 - 3250$ ii) $68530 - 4250$ iii) $4500 - 75280$ iv) $4000 - 55000$
   v) $3800 - 45000$.   **(05 Marks)**

OR

2   a. Write minterm and maxterm for the 3 binary variables. Express the following function in canonical mintern and maxterm.
   i) $F = a'b + cd'$ ii) $F = p + q'r$.   **(10 Marks)**

   b. Solve the following using K – map.
   i) $f(A, B, C) = A'C + A'B + AB'C + BC$.
   ii) $f(w, x, y, z) = \Sigma(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$.   **(10 Marks)**

Module-2

3   a. What is full adder? Write the truth table and get the expression for sum and carry. And implement the same in sum of products.   **(10 Marks)**

   b. Implement the following function with NAND and NOR gates
   $F(x, y, z) = \Sigma(0, 6)$.   **(10 Marks)**

OR

4   a. What is Decoder? Construct 3 – to – 8 line decoder.   **(10 Marks)**

   b. Explain 4 – bit binary parallel adder.   **(10 Marks)**

Module-3

5   a. Explain the connection between processor and memory, with neat diagram.   **(10 Marks)**

   b. Explain any five addressing modes.   **(10 Marks)**

OR

6   a. With neat diagram, explain basic functional unit of a computer.   **(06 Marks)**

   b. Explain big – endian and little – endian assignments.   **(06 Marks)**

   c. Explain basic instruction types.   **(04 Marks)**

Module-4

7 a. What is Assembly Language Program? Write ALP that reads one line from keyboard, stores it in memory buffer and echoes it back to the display. **(10 Marks)**
   b. What is an Interrupt? Explain vectored interrupt. **(10 Marks)**

OR

8 a. With neat diagram, explain use of DMA controller in a computer system. **(10 Marks)**
   b. Explain the types of Bus Arbitration. **(10 Marks)**

Module-5

9 a. Explain the internal organization of 2M × 8 dynamic memory chip, with neat diagram. **(10 Marks)**
   b. Define ROM cell and explain types of ROM. **(10 Marks)**

OR

10 a. Explain the purpose of Cache memory. Explain direct mapping technique with example. **(10 Marks)**
   b. Explain Virtual – memory address translation. **(10 Marks)**

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