First Semester MCA Degree Examination, June/July 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.   Perform the following number conversions :
         i) $(172.53)_8$ to ( )$_{10}$
         ii) $(A9DF)_{16}$ to ( )$_8$
         iii) $(B946E)_{16}$ to ( )$_2$
         iv) $(10110110111110.001110)_2$ to ( )$_{16}$
         v) $(2047)_{10}$ to ( )$_8$.   (10 Marks)

    b.   Convert the following to canonical form
         i) $F(A, B, C, D) = \Sigma(0, 2, 6, 11, 13, 14)$
         ii) $F(A, B, C, D) = \pi(0, 1, 2, 3, 4, 6, 12)$.   (06 Marks)

OR

2   a.   Simplify the following expression using K – Map
         $Z = f(w, x, y, z) = \Sigma(0, 14, 5, 9, 11, 13, 15)$
         $K = f(A, B, C) = \overline{AB} + ABC + \overline{BC}$.   (06 Marks)

    b.   Demonstrate by means of truth tables the validity of the following theorems of Boolean
         algebra.
         i)   The associative laws
         ii) Dr. Morgan's theorems for three variables.   (10 Marks)

Module-2

3   a.   Implement the following expression by using only NAND gates.
         $F = XY + \overline{X}Z + XYZ + \overline{Y}Z$.   (04 Marks)
    b.   Explain BCD adder with the block diagram.   (06 Marks)
    c.   Explain RS Master – Slave Flip-Flop.   (06 Marks)

OR

4   a.   Explain look ahead carry adder with Boolean expressions for carry generated.   (08 Marks)
    b.   Explain Booth algorithm and perform the multiplication for 8×-6.   (08 Marks)

Module-3

5   a.   Explain different functional units of digital computer system with diagram.   (08 Marks)
    b.   Discuss the factors affecting the performance of the computer system.   (08 Marks)

OR

6 a. Explain the connection between the processor and the memory with an example. (08 Marks)
  b. With a neat diagram, explain the basic I/O operations in computer. (08 Marks)

Module-4

7 a. What is interrupt nesting? Explain. (06 Marks)
  b. What is BUS? Explain synchronous and asynchronous bus in detail. (10 Marks)

OR

8 a. How simultaneous interrupt requests are handled? (06 Marks)
  b. Write a note on exceptions. (06 Marks)
  c. Draw and explain the I/O interface for input device. (04 Marks)

Module-5

9 a. Explain the following :
     i) ROM   ii) PROM   iii) EPROM   iv) EEPROM. (10 Marks)
  b. Explain how speed, cost and size of the memory is related. (06 Marks)

OR

10 a. Discuss the asynchronous DRAM with block diagram for 16 megabit DRAM chip. (10 Marks)
   b. Write a short note on Magnetic Hard Disks. (06 Marks)

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