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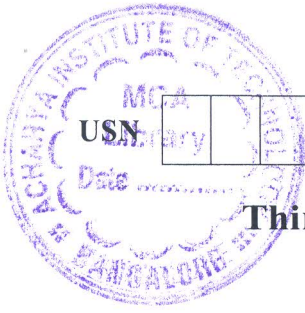
Third Semester B.E. Degree Examination, Jan./Feb. 2023
Computer Organization

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1 a. Explain with a neat diagram, the connection between the processor and the computer memory. **(05 Marks)**
   b. Explain the basic instruction types with example. **(05 Marks)**
   c. Define addressing mode. Explain the various addressing mode with example. **(10 Marks)**

OR

2 a. Explain the methods to improve the performance of computer. **(05 Marks)**
   b. Explain Big-Endian, little – Endian and assignment byte addressability. **(05 Marks)**
   c. Point out various shifts and rotate instruction and example with neat diagram. **(10 Marks)**

Module-2

3 a. Define bus arbitration. Explain detail any one approach of bus arbitration. **(10 Marks)**
   b. What is Interrupts? Explain interrupt priority scheme. **(05 Marks)**
   c. What is DMA? Write a note on register in DMA interface. **(05 Marks)**

OR

4 a. With a block diagram, explain how the printer interfaced to processor. **(10 Marks)**
   b. Explain the following with respect to USB:
      i)   U.S.B. Architecture
      ii) U.S.B. protocols. **(10 Marks)**

Module-3

5 a. Explain synchronous DRAMS with a block diagram. **(05 Marks)**
   b. Define ROM. Explain various types of ROMS. **(05 Marks)**
   c. With a neat diagram, explain the internal organization of a $2M \times 8$ dynamic memory chip. **(10 Marks)**

OR

6 a. Explain in detail. Associative mapping technique and set associative mapping technique with neat diagram. **(10 Marks)**
   b. What is virtual memory? With a neat diagram, explain how virtual memory address is translated. **(10 Marks)**

Module-4

7   a. Perform following operations on the 5-bit signed numbers using 2's complement representation system. Also indicate whether overflow has occurred.
     i) $(-9) + (-7)$ ii) $-(-8)$ **(05 Marks)**
     b. Explain with a neat diagram, 4 bit carry look ahead adder.   **(05 Marks)**
     c. Explain the concept of carry save addition for the multiplication operation. $M \times Q = P$ for 4-bit operands with diagram and suitable example.   **(10 Marks)**

OR

8   a. Multiply the following signed 2's complement members using Booth's algorithm, multiplicand = $(010111)_2$, multiplier = $(110110)_2$.   **(05 Marks)**
     b. Perform division operation on the following unsigned numbers using the restoring method. Dividend = $(10101)_2$, Divisor = $(00100)_2$.   **(05 Marks)**
     c. With a neat diagram, explain the floating point addition/subtraction unit.   **(10 Marks)**

Module-5

9   a. Draw and explain multiple bus organization of CPU and write the control sequence for the instruction add R_4, R_5, R_6 for the multiple bus organization.   **(10 Marks)**
     b. Explain with neat diagram, micro programmed control method for design of control unit and write the micro-routine for the instruction branch < 0.   **(10 Marks)**

OR

10   a. With block diagram, explain the working of microwave oven in an embedded system.   **(10 Marks)**
     b. With block diagram, explain parallel I/O interface.   **(10 Marks)**

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