CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐   17CS34

Third Semester B.E. Degree Examination, July/August 2022
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. Draw and explain the connections between the processor and the main memory.   **(08 Marks)**
   b. What is performance? Explain basic performance equation and overall SPEC rating of computer.   **(07 Marks)**
   c. Explain Big-Endian and Little-Endian methods with examples.   **(05 Marks)**

OR

2 a. What is addressing mode? Explain any four addressing mode with example.   **(08 Marks)**
   b. Explain the Basic Instruction types with example.   **(06 Marks)**
   c. Explain the shift and rotate operations with examples.   **(06 Marks)**

Module-2

3 a. What is an interrupt? With supporting diagram, explain the following :
      (i) Interrupt Nesting
      (ii) Simultaneous request   **(08 Marks)**
   b. What do you mean by DMA? Explain its operations using registers in a DMA interface.   **(08 Marks)**
   c. What are exceptions? List and explain the different kinds of exceptions.   **(04 Marks)**

OR

4 a. What is Bus Arbitration? Explain centralized and distributed arbitration with a neat diagram.   **(10 Marks)**
   b. Explain the following with respect to USB:
      (i) USB Architecture   (ii) USB Addressing   **(10 Marks)**

Module-3

5 a. With a neat diagram, explain the internal organization of a 2M×8 dynamic memory chip.   **(07 Marks)**
   b. Explain direct mapping technique and set associative mapping technique.   **(08 Marks)**
   c. Define ROM. List and explain various types of ROMS.   **(05 Marks)**

OR

6 a. What is virtual memory technique? Explain virtual memory address translation.   **(08 Marks)**
   b. Explain synchronous DRAMS with a block diagram.   **(08 Marks)**
   c. Define the following :
      (i) Memory latency   (ii) Memory bandwidth
      (iii) Hit-rate   (iv) Miss - penalty   **(04 Marks)**

Module-4

7 a. Explain with a neat block diagram, 4-bit carry look ahead adder.   **(08 Marks)**
   b. Perform the following operations on the 4-bit signed numbers using 2's complement representation system:
      (i) $(-5)+(-2)$ (ii) $(-7)-(-5)$ (iii) $(-7)-(+1)$ (iv) $(+2)-(-3)$.   **(08 Marks)**

c. Write the rules for addition and subtraction of 'n' bit signed integers using 2's complement representation system.   **(04 Marks)**

OR

8   a. Perform the multiplication for +13 and –6 using Booth's algorithm.   **(10 Marks)**
    b. Write algorithm that performs restoring division. Perform division using restoring algorithm.
        Dividend = $(1000)_2$
        Divisor = $(0011)_2$
                                                                                        (10 Marks)

Module-5

9   a. Explain single-bus organization of the data-path inside a processor with neat diagram.
                                                                                        (10 Marks)
    b. Write the control sequence for execution of the instruction Add (R_3), R_1 in the execution of a complete instruction.   **(10 Marks)**

OR

10 a. Write short notes on :
        (i)   Hardwired control
        (ii) Micro programmed control.   **(10 Marks)**
    b. With block diagram, explain the working of a microwave oven.   **(10 Marks)**

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