

CBCS SCHEME

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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 (R₃), R₁ 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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