

USN

--	--	--	--	--	--	--	--	--	--

18CS34

Third Semester B.E. Degree Examination, Feb./Mar. 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. With a neat diagram, explain the different processor registers. (08 Marks)
b. Explain the overall SPEC rating for the computer in a program suite. (04 Marks)
c. Explain one address, two address and three address instruction with examples. Also, use any of these instructions to carry out $C \leftarrow [A] + [B]$. (08 Marks)

OR

- 2 a. What is an addressing mode? Explain the different addressing modes. With an example for each. (10 Marks)
b. Explain shift and rotate operations, with example. (10 Marks)

Module-2

- 3 a. What is direct memory access, when it is used? Explain it with block diagram. (08 Marks)
b. Define the terms 'cycle stealing' and 'burst mode with respect to DMA'. (04 Marks)
c. Define bus arbitration. Explain in detail centralized bus arbitration. (08 Marks)

OR

- 4 a. With a block diagram, explain how the keyboard is connected to processor. (08 Marks)
b. Explain the use of a PCI bus in a computer system with a neat sketch. (08 Marks)
c. What are the design objectives of USB? (04 Marks)

Module-3

- 5 a. Draw a neat block diagram of memory hierarchy in a computer system. Discuss the variation of size, speed and cost per bit in the hierarchy. (08 Marks)
b. Explain the working of a single transistor dynamic memory cell and internal organization of a 16 megabit DRAM chip configured as $2M \times 8$ cells. (12 Marks)

OR

- 6 a. Explain the different mapping functions used in cache memory. (12 Marks)
b. What is replacement policy? Explain LRU replacement algorithm. (04 Marks)
c. Explain memory interleaving with necessary diagram. (04 Marks)

Module-4

- 7 a. Perform the following operations on the 5-bit signed numbers using 2's complement representation system:
i) $(-10) + (-13)$
ii) $(-10) - (+4)$
iii) $(-3) + (-8)$
iv) $(-10) - (+7)$ (10 Marks)
b. In a carry look ahead addition, explain the generate G_i and propagate P_i functions for stage i . Using this design explain 4 bit carry look ahead adder. (10 Marks)

OR

- 8 a. Perform the signed multiplication of numbers +13 and -6 using booth multiplication and bit pair recording method. List the tables used. (10 Marks)
- b. Perform division of number 9 by 3($9 \div 3$) using the restoring division algorithm. Write the steps of algorithm used. (10 Marks)

Module-5

- 9 a. Draw and explain multiple bus organization. Explain its advantages. (10 Marks)
- b. Write and explain the control sequence for execution of an unconditional branch instruction. (10 Marks)

OR

- 10 a. Draw the block diagram of the control unit organization and describe. (10 Marks)
- b. Explain basic idea of instruction pipelining. (10 Marks)

* * * * *