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18CS34

Third Semester B.E. Degree Examination, Jan./Feb. 2021
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. How to measure the performance of a computer? Explain. **(08 Marks)**
   b. Define addressing modes. Explain any five types of addressing modes with example.
   (12 Marks)

OR

2 a. Define subroutine and parameter passing. Explain how to pass the parameter by value and by reference. **(10 Marks)**
   b. How the input and output operations are to be performed by the processor? Write a program that reads a line of characters and displays it. **(10 Marks)**

Module-2

3 a. Write the scenario when the interrupts are enabled. **(06 Marks)**
   b. Explain how the I/O devices should be organized in a priority structure. **(08 Marks)**
   c. Define exception, describe the different kinds of exceptions. **(06 Marks)**

OR

4 a. Define bus arbitration. Explain the two approaches to bus arbitration. **(10 Marks)**
   b. With the help of timing diagram, explain the read operation on the PCI bus. **(10 Marks)**

Module-3

5 a. Explain the operation of a CMOS memory cell. **(06 Marks)**
   b. With a neat figure, explain the organization of a $2M \times 32$ memory module using $512K \times 8$ static memory chips. **(08 Marks)**
   c. Explain the internal structure of synchronous DRAM. **(06 Marks)**

OR

6 a. What is the use of a cache memory? Explain in detail the three types of determining the cache locations to store memory blocks. **(10 Marks)**
   b. How the parallelism is to be used as on interleaving? Explain. **(10 Marks)**

Module-4

7 a. A half adder is a combinational logic circuit that has two inputs x and y and two outputs sum(s) and carry(c), resulting from the binary addition of x and y.
   i) Design a half adder as a two-level AND–OR circuit.
   ii) Show how to implement a full-adder using two half address and external logic gates, as necessary. **(10 Marks)**
   b. Given, multiplicand A = + 23 and multiplier B = –10. Perform the multiplication of A and B using Booth's algorithm. **(10 Marks)**

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OR

8 a. Explain 4-bit carry-look ahead adder. **(10 Marks)**

b. Perform the division of $8 \div 3$ using restoring division. **(10 Marks)**

Module-5

9 a. Write and explain the control sequence for execution of the instruction Add(R3), R1.

(10 Marks)

b. Explain the three-bus organization of the dater path. **(10 Marks)**

OR

10 a. Explain in detail the organization of control unit. **(10 Marks)**

b. Explain the operation of 4-stage pipeline. **(10 Marks)**

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