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10CS46

Fourth Semester B.E. Degree Examination, June / July 2013
Computer Organization

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO question from each part.

PART - A

- 1
 - a. With a neat block diagram, discuss the basic operational concepts of a computer. (06 Marks)
 - b. List the different systems used to represent a signed number and give one example for each. Specify which number representation system is preferred in a computer and why? (04 Marks)
 - c. Perform the following operations on the 5 – bit signed numbers using 2's complement representation system. Also indicate whether overflow has occurred.
 - i) $(-10) + (-13)$ ii) $(-10) - (+4)$ iii) $(-3) + (-8)$ iv) $(-10) - (+7)$. (10 Marks)
- 2
 - a. Define addressing mode. Explain the following addressing modes with an example for each:
 - i) Index addressing mode ii) Indirect addressing mode iii) Relative addressing mode
 - iv) Auto decrement addressing mode. (10 Marks)
 - b. With a neat block diagram, describe the input and output operations. (05 Marks)
 - c. Discuss briefly encoding of machine instructions. (05 Marks)
- 3
 - a. With neat sketches, explain various methods for handling multiple interrupt requests. (12 Marks)
 - b. Define bus arbitration. Explain in detail any one approach of bus arbitration. (08 Marks)
- 4
 - a. With a neat diagram, explain in detail the input interface circuit. (10 Marks)
 - b. List out the functions of an I/O interface. (03 Marks)
 - c. Discuss briefly the protocols of universal serial bus. (07 Marks)

PART - B

- 5
 - a. Briefly explain any two cache mapping functions. (06 Marks)
 - b. With a neat diagram, explain the translation of a virtual address to a physical address. (08 Marks)
 - c. Discuss in detail any one feature of memory design that leads to improved performance of computer. (06 Marks)
- 6
 - a. Perform signed multiplication of numbers (-12) and (-11) using Booth's algorithm. (08 Marks)
 - b. Given $A = 10101$ and $B = 00100$ perform A/B using restoring division algorithm. (08 Marks)
 - c. Design a logic circuit to perform addition / subtraction of two 'n' bit numbers X and Y. (04 Marks)
- 7
 - a. Write down the control sequence for the instruction Add R_4, R_5, R_6 for three – Bus organization. (04 Marks)
 - b. With a neat sketch, explain the organization of a micro programmed control unit. (08 Marks)
 - c. With an example, explain the field coded microinstructions. (08 Marks)
- 8
 - a. Describe the working of message passing multicomputer (MPM) architecture. (08 Marks)
 - b. Briefly explain any two parallel computer architecture. (08 Marks)
 - c. List out any four differences between shared memory multiprocessor and cluster. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. $42+8 = 50$, will be treated as malpractice.