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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)**

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