Fourth Semester B.Tech. Degree Examination, May 2014
(2008 Scheme)
08.403 : COMPUTER HARDWARE DESIGN (R)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer all questions. Each question carries 4 marks each :

1. What is overflow ? Give an example.
2. Give the schematic of 2x2 array multiplier.
3. What is the advantage of representing numbers in floating point representation in comparison with fixed point representation?
4. What are the major steps in addition/subtraction of two floating point numbers?
5. What are the components that form the basis of a register transfer logic method ?
6. How is accumulator register different from other registers ?
7. Show how a parallel adder can be used to perform decrement by 1 operation.
8. What are the different methods of control organization ?
9. What is microprogram sequencer ?
10. What is microprogrammed CPU organization ?

(10x4=40 Marks)

PART – B

Each full question carries 20 marks.

Module – I

11. a) What is the principle behind Booth’s multiplication algorithm ? Write the Booth’s multiplication algorithm.

b) Show the contents of various registers after each step in the multiplication of – 9 by –11 represented in 2’s compliment form.

OR

P.T.O.
12. a) Design an array multiplier for multiplying two 4 bit numbers.
   b) Write the algorithm for addition/subtraction of binary numbers in 2's complement representation.

**Module – II**

13. a) Explain the bus organization for multiple registers (say 4 nos) for communicating with memory.
   b) Show the hardware for implementing the statement $T : A < - A + B$, Which denotes addition of two signed numbers in 2's complement form
      
      $V \leftarrow C_n \oplus C_{n+1}.$

   OR

14. a) Give the design of a status register and explain.
   b) Give the design of a shifter.

**Module – III**

15. Design a hard wired control for addition/subtraction of two numbers in sign magnitude form.

   OR

16. With block diagram explain microprogram control.

$(3 \times 20 = 60 \text{ Marks})$