Reg. No. : ....

Name : ....

Fourth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)
Branch : Computer Science
08.403 : COMPUTER HARDWARE DESIGN (R)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. Explain how floating point representations are done in computer memory.

2. What is an array multiplier ?

3. If the remainder off a non-restoring division is a negative number, what should be done to correct the result ? Why ?

4. Design a circuit that detects overflow in signed 2's complement representation.

5. Design a circuit to implement the micro-operations :

$$XT_5 : A \leftarrow A + B$$
$$\overline{X}T_7 : A \leftarrow A + \overline{B} + 1$$

6. What are different arithmetic micro-operations ?

7. Differentiate between micro-operation and macro-operation with an example.

8. What is the difference between PLA control and ROM control ?

9. Explain the working of Control Address Register (CAR) in microprogram control.

10. Explain about nanoinstructions.

(10×4=40 Marks)

P.T.O.

PART – B

MODULE – I

11. a) With a block diagram explain 4×3 array multiplier using parallel adders. 8

   b) Explain the hardware for Booth's multiplication. Using Booth's multiplication algorithm, multiply $+21 \times -9$. 12

   OR

12. a) Draw the register configuration for floating point arithmetic operations. 6

   b) With example explain restoring method of division. Draw the flow chart. 14

MODULE – II

13. Design an arithmetic circuit with two selection variables S_0 and S_1, that generates the following arithmetic operations. Draw the logic diagram of one typical stage.

S_1	S_0	$C_{in}=0$	$C_{in}=1$
0	0	F = A+B	F = A+B+1
0	1	F = A	F = A+1
1	0	F = $\bar{B}$	F = $\bar{B}$+1
1	1	F = A+ $\bar{B}$	F = A+ $\bar{B}$+1

20

   OR

14. Design a simple computer which can perform following three categories of operations
   MOV R
   LDI OPRD
   LDA ADRS 20

MODULE – III

15. a) With a neat diagram explain micro-program sequencer and its importance in design of control memory. 15

   b) What is a control state diagram ? Explain its use in designing a control unit. 5

   OR

16. What is a microprogram ? Explain the working of microprogram control unit with a neat diagram. 20