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2336

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 :
 $XT_5 : A \leftarrow A + B$
 $\bar{X}T_7 : A \leftarrow A + \bar{B} + 1$
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. **(10x4=40 Marks)**

P.T.O.



PART – B

MODULE – I

11. a) With a block diagram explain 4x3 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