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A – 3961

Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, June 2016
(2008 Scheme)**

08.403 : COMPUTER HARDWARE DESIGN (R)

Time : 3 Hours

PART – A



Answer **all** questions. **Each** question carries **4** marks **each**.

1. Write the algorithm for multiplication two fixed point numbers in signed magnitude representation.
2. What is a divide overflow condition ? How it is handled in fixed point and floating point representations ?
3. How BCD subtraction is performed ?
4. How memory read and write operations are specified in register transfer logic ?
5. How arithmetic shift operation is done ? Show examples.
6. What is the purpose of a conditional control statement in register-transfer language ? Give examples.
7. What is the relationship between control and data processor in a digital system ? Explain the use of master clock generator and timing diagram.
8. What is the difference between hard wired control and microprogram control ? What are the advantages and disadvantages in each method ?
9. Explain horizontal and vertical micro instruction formats.
10. What is the use of control state diagram in the design of a hard wired control ?

P.T.O.



PART - B

Each full question carries 20 marks.

Module - I

11. a) How addition and subtraction operations are done on signed magnitude representation? Write algorithm and hardware implementation. 10

b) Write the algorithm for addition and subtraction of floating point numbers. 10

OR

12. a) Design a BCD adder. 10

b) Write the algorithm for multiplication and division of floating point numbers. 10

Module - II

13. Design an accumulator register with the following set of micro operations. Add, Clear, Complement, AND, OR, Exclusive OR, Shift right, Shift left, Increment and Check for zero. Show the typical accumulator stage and also 4 bit complete accumulator. 20

OR

14. Design an arithmetic circuit with two selection variables S1 and S0 that generates the following arithmetic operations. Draw the logic diagram for one typical stage.

S1	S0	Cin = 0	Cin = 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

Module - III

15. a) How control of processor unit is done? 10

b) Which are the different specialized methods of control organization? 10

OR

16. a) What is the function of a microprogram sequencer? Explain the typical microprogram sequencer organization. 10

b) How a control unit can be designed using PLA? 10