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1328

Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, April/May 2012
(2008 Scheme)**

**Branch : COMPUTER SCIENCE AND ENGINEERING
08.403 : Computer Hardware Design (R)**

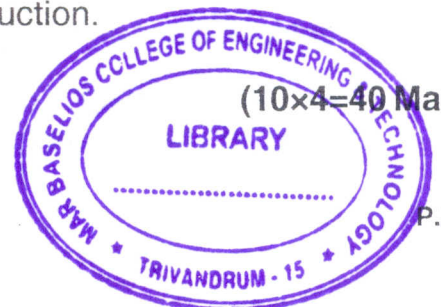
Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **All** questions carry **equal** marks.

1. Write an algorithm for floating point multiplication.
2. Show the diagram of a 3×3 array multiplier using 9 AND gates, 3 full adders and a half adder.
3. Show the hardware required for a BCD adder/subtractor.
4. Explain any one algorithm for multiplication of negative numbers.
5. List the micro operations for pushing and popping a stack simulated with a random access memory.
6. Show the block diagram that executes the statement T : $A \leftarrow B, B \leftarrow A$.
7. Give the block diagram of a processor organization with multiple bus system.
8. List the advantages of microprogrammed control over hardwired control.
9. Explain the format of a typical symbolic microinstruction.
10. Draw the block diagram of a bit sliced CPU.



(10x4=40 Marks)

P.T.O.



PART – B

Answer **any one full** question from **each** Module.

Module – I

11. a) With a flowchart explain the method for floating point addition/subtraction. 10
 b) With a suitable example explain the algorithm for division using non restoring method. 10

OR

12. a) Formulate a hardware procedure for detecting an overflow by comparing the sign of the sum with the signs of augend and addend. The numbers are in signed two's complement representation. 10
 b) Derive an algorithm for division with binary numbers represented in 2's complement form. 10

Module – II

13. a) Design an accumulator to implement any four operations of your choice. 10
 b) Explain how conditional branch is implemented in the CPU. Take any one such instruction as example. 10

OR

14. Design a logic circuit that performs the four logic operations of exclusive-OR, equivalence, NOR, and NAND. Use two selection variables. Show the logic diagram of one typical stage. 20

Module – III

15. a) What are the steps involved in the design of a hardwired control unit ? Explain with an example. 10
 b) Write a symbolic micropogram routines for BRANCH and STORE instructions. Assume a suitable format for the microinstructions. 10

OR

16. a) With block diagram explain the decoding pattern of vertical microinstructions. 10
 b) Draw the block diagram for the selection of next address for a control memory and explain the working. 10

(3×20=60 Marks)

