MCA/D-15

COMPUTER ARCHITECTURE AND PARLLEL PROCESSING

PAPER-MCA-503

Time Allowed: 3 Hours Maximum Marks: 80

Note: Attempt Five questions in all, selecting at least one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Answer the following questions in brief :
   (a) Differentiate multicomputers and Multiprocessors
   (b) Discuss the relative advantage and disadvantages of hardwired control unit over Microprogrmmed one
   (c) Differentiate computer organization and architecture.
   (d) Explain the significance of Data dependence.
   (e) Compare VLIW and superscalar processors.
   (f) Write a short note on Register renaming.
   (g) Differentiate static and dynamic interconnection networks
   (h) Discuss Snoopy bus protocol.

UNIT=I

2. (a) Devise and algorithm in Flowchart from to add/ subtract two integers represented in signed 2's complement from.

   (b) Show the step-by-step multiplication process usinb Booth algorithm when the following binary numbers are multiplied. Assume 5-bit registers that hold signes numbers.
   (+15) * (-13).

2. (a) Explain Horizontal and Vertical Microinstruction formats.

   (b) Explain the working of a Microprogram sequencer with the help if suitable diagram.

UNIT-II

4. (a) Discuss the classifications of parallel architectures.
   (b) Discuss instruction level parallel processors.

5. (a) State and explain principle and general structure of pipeline. Explain its (pipeline) performance measures.

(b) Discuss Local and Global Optimizations in brief.

UNIT-III

6. Design the resource-shared multiple pipeline structure. Assume theat the processor can issue two instructions per cycle if there is no resource conflict and no data dependence problem. Also discuss in detail the Pipeline stalling.

7. Write short notes on the following :

   (a) Delyated branching
   (b) Branch penalties.

UNIT-IV

8. Discuss UMA, NUMA and COMA models in detail/

9. (a) Construct a 16*16 Omega Network. Male use of 2*2 switches for constructions.

   (b) Explain the cache coherence problem. Explain the directory based protocol.