BICS-025

B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

Term-End Examination

June, 2016

00856

BICS-025 : ADVANCED COMPUTER ARCHITECTURE

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer any **seven** questions. All questions carry equal marks.*

1. A particular task in a six-segment pipeline can be processed with a click cycle of 10 ns. The same task takes 50 ns to process in a non-pipelined system. Determine the speed-up ratio of the pipeline for 50 tasks. What is the maximum speed-up that can be achieved ?   *10*

2. Draw a pipeline configuration to carry out the following arithmetic operation with a stream of numbers :

    $$(A_iB_i - C_i + D_i) (E_i * F_i)$$

    List the contents of all registers in the pipeline for i = 1 to 5.   *10*

3. Differentiate between time-shared (Common Bus) and multiport memory based multiprocessor systems in terms of simplicity, flexibility and reliability. *10*

4. Define the following terms with respect to system interconnection architecture : *10*
   (a) MFLOPs
   (b) Superscalar processor
   (c) Latency
   (d) Node degree
   (e) Instruction prefetching

5. Compare control flow and data flow computers in terms of control complexity, potential for parallelism and cost effectiveness. *10*

6. What is virtual memory ? What is its advantage ? How is virtual address mapped to memory map table ? Explain with the help of a diagram. *10*

7. Explain matrix multiplication algorithm for SIMD architecture with the help of an example. *10*

8. Draw a crossbar interconnection network. How does it work ? What are its drawbacks ? How does the multistage network overcome these networks ? *10*