

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

Term-End Examination

December, 2018

00263

**BICS-025 : ADVANCED COMPUTER
ARCHITECTURE**

Time : 3 hours

Maximum Marks : 70

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

1. (a) Make a dataflow graph of the following expression : 4
$$f = (x_i + y_i) * (x_i - a_i) / (z_i - b_i); \text{ for } i = 1 \text{ to } 8$$
- (b) How many cycles will be required for data driven execution on a 4-processor data flow computer ? 6
2. Draw an arithmetic pipeline for floating point subtraction operation with an appropriate example. How many segments are required ? What are the sub-operations performed in these segments ? 10

3. (a) How are branch operation related difficulties managed in an instruction pipeline ? Discuss. 6
- (b) Explain the following terms : 4
- (i) Pipeline throughput
- (ii) Pipeline efficiency
4. (a) Draw the architecture of SIMD and MIMD machines and describe their architectural characteristics and operations. 5
- (b) Draw a 4-cube interconnected architecture by interconnecting two 3-cubes and comment on the scalability of the network. 5
5. (a) How does a crossbar interconnection network work ? Explain with the help of a diagram. 5
- (b) Define the following terms with respect to parallelism and dependence relations : 5
- (i) Communication latency
- (ii) Flynn dependence
6. Discuss the differences between tightly coupled microprocessors and loosely coupled microprocessors from the viewpoint of hardware organization and programming technique. 10

7. (a) What is the use of bus arbitration logic in multiprocessor system ? Briefly describe Daisy chain arbitration logic. 6
- (c) Explain the meaning of a reservation table with the help of an example. 4
8. (a) Construct a diagram for a 4×4 Omega switching network. Also show the switch setting required to connect input 3 to output 1 line. 6
- (b) Describe the following terminology associated with multiprocessing : 4
- (i) Hardware Lock
 - (ii) Mutual Exclusion
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