

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

Term-End Examination

June, 2017

00465

BICS-022 : COMPUTER ARCHITECTURE

Time : 3 hours

Maximum Marks : 70

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

1. (a) Suppose we have two implementations of the same instruction set architecture. Machine A has clock cycle of 1 ns and a CPI of 2.0 for a program and Machine B has a clock cycle of 2 ns and CPI of 1.2 for the same program. Which machine is faster for this program and by how much? 6
- (b) Define the following terms : 4
- (i) Linker
 - (ii) Executable file
 - (iii) Stored program concept
 - (iv) Accumulator

2. What are the possible addressing modes and their possible uses ? Explain through examples. 10

3. Write an assembly language program to evaluate the following arithmetic expression : 10

$$A = \frac{B + C * D \uparrow 2}{E * F}$$

- (a) using a general register computer with two address instructions.
- (b) using an accumulator based computer with one address instruction.
- (c) using a stack organized computer with zero address instruction.

4. Design an instruction pipeline for a computer. Specify the operations to be performed in each segment. How can the throughput of this pipeline be calculated ? 10

5. What are the major hazards that cause the instruction pipeline to deviate from the normal operation ? Explain. 10

6. Discuss the following types of dependencies for parallel execution of any program with examples : 10

- (a) Data dependencies
- (b) Name dependencies
- (c) Control dependencies

7. What is the purpose of Tomasulo's approach in a dynamically scheduled pipeline ? Explain. 10
8. Distinguish between 10
- (a) Shared memory and Distributed memory
 - (b) Coherence and Consistency
9. Distinguish between instruction level parallelism and loop level parallelism. How does a vector processor exploit loop level parallelism ? 10
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