

CBCS SCHEME

USN

15CS72

Seventh Semester B.E. Degree Examination, July/August 2022 Advanced Computer Architecture

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With neat sketches, explain the Flynn's classification of computer architecture. (06 Marks)
- b. With a neat diagram, explain different types of shared memory multiprocessor models. (10 Marks)

OR

- 2 a. Explain the different levels of parallelism in program execution on modern computers. (08 Marks)
- b. For the following coarse-grain program graph with two processor p_1 and p_2 . [Refer Fig.Q2(b)]

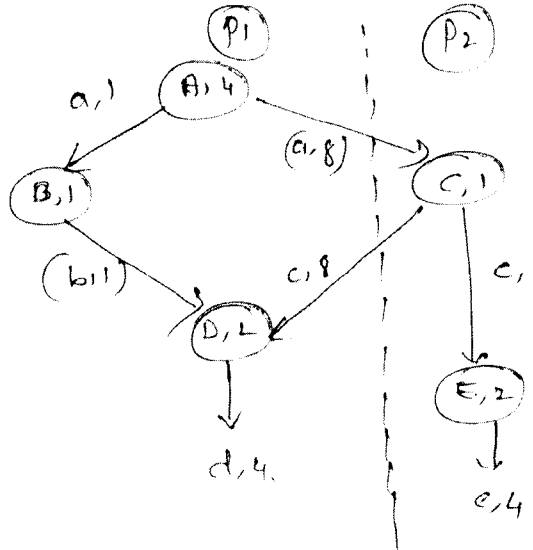


Fig.Q2(b)

Draw the following:

- (i) Schedule chart without node duplication
- (ii) Coarse-grain graph with node duplication.
- (iii) Schedule chart with node duplication. (08 Marks)

Module-2

- 3 a. Explain the concept of instruction pipeline and also define basic definitions associated with instruction pipeline operations. (08 Marks)
- b. Draw the neat sketch of a typical superscalar RISC processor architecture consisting of an integer unit and floating point unit. Also discuss the pipelining in super scalar processor. (08 Marks)

OR

- 4 a. With a neat diagram, explain the four levels of memory hierarchy. (08 Marks)
- b. Explain the concept of address translation mechanism using TLB and various forms of page table. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42-8=50, will be treated as malpractice.

Module-3

- 5 a. With a neat diagram, explain the back plane bus specification, its interface and slot connections. (08 Marks)
- b. Describe the sequential consistency model along with its necessary conditions to be satisfied. Also define 5 axioms for the same. (08 Marks)

OR

- 6 a. Explain the idea of internal data forwarding in pipeline. Also define three types of logic hazards which will affect out of order execution. (08 Marks)
- b. With suitable examples, explain four types of block placement schemes for cache memory. (08 Marks)

Module-4

- 7 a. Explain the schematic design of a row of cross point switches in a cross bar network. (08 Marks)
- b. With a proper illustration, explain snoopy bus protocol for cache coherence problem. (08 Marks)

OR

- 8 a. Explain different types of vector instructions along with diagrams. (08 Marks)
- b. With a neat diagram, explain the concept of distributed shared memory with virtual memory mapping (SVM). (08 Marks)

Module-5

- 9 a. Describe four operational models used in programming multiprocessor systems. (08 Marks)
- b. List out different language features set as a guidelines for developing user friendly programming environment. (08 Marks)

OR

10 Write short notes on:

- a. Operand forwarding
- b. Register renaming
- c. Branch prediction
- d. Reorder buffer

(16 Marks)

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