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Second Semester M.Tech. Degree Examination, Jan./Feb. 2023 Advanced Computer Architecture

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. With neat diagram, explain the elements of modern computer system, (06 Marks)
b. Explain performance factor and system attributes. (06 Marks)
c. Explain architecture of vector super computer. (08 Marks)

OR

- 2 a. Explain Data and Resource dependences (06 Marks)
b. Differentiate control flow and data flow mechanism. (06 Marks)
c. Explain levels of parallelism in program execution on modern computers. (08 Marks)

Module-2

- 3 a. Discuss the important characteristics of parallel algorithm. (06 Marks)
b. Explain efficiency, utilization and quality. (06 Marks)
c. Explain virtual memory models. (08 Marks)

OR

- 4 a. With neat diagram, explain IBM/6000 superscalar processor architecture. (07 Marks)
b. List the metrics affecting scalability of a computer system, Explain with neat diagram. (06 Marks)
c. A hypothetical workload characterized by
 $O(1) = T(1) = n^3$, $O(n) = n^3 + n^2 \log_2 n$ and
 $T(n) = 4n^3/(n + 3)$.
Determine: $S(n)$, $E(n)$, $R(n)$, $U(n)$ and $Q(n)$. (07 Marks)

Module-3

- 5 a. What are the functional modules of multiprocessor system? (05 Marks)
b. Explain interleaved memory organization. (07 Marks)
c. Explain sequential and weak consistency models. (08 Marks)

OR

- 6 a. Explain Direct Mapping cache organization. (10 Marks)
b. Explain Mechanism of Instruction pipelining. (10 Marks)

Module-4

- 7 a. Explain vector processing principles. (10 Marks)
b. Explain the architecture and processing nodes of the connection machine CM-2. (10 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.

OR

- 8 a. With neat diagram, explain multithreading issues and solutions. (10 Marks)
- b. Explain Latency hiding technique. (10 Marks)

Module-5

- 9 a. Explain parallel programming models. (10 Marks)
- b. Explain parallel language features for parallelism. (10 Marks)

OR

- 10 a. How many levels of multitasking on cray multiprocessors are there? Explain them. (10 Marks)
- b. Discuss shared variable program structures. (10 Marks)

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