USN

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024
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. Illustrate Flynn's classification with suitable diagrams.   **(10 Marks)**
     b. Distinguish the following with respect to node degree and diameter with an example:
         i)   Chordal ring and Barrel shifter
         ii) Hypercubes and cube connected cycles.   **(10 Marks)**

OR

2   a. Identify the mismatch between hardware and software parallelism when you have 4 loads
         and 4 arithmetic operations.   **(10 Marks)**
     b. List and explain the speedup performance laws with respect to parallel processing.
                                                                                            (10 Marks)

Module-2

3   a. Compare architectural distinction with respect to characteristics of CISC and RISC
         architectures.   **(10 Marks)**
     b. Demonstrate register window overlapping in SUN Microsystems SPARC with diagram.
                                                                                            (10 Marks)

OR

4   a. Explain Hierarchical memory technology with respect to 5 parameters with diagram.
                                                                                            (10 Marks)
     b. Explain paging and show how translation look-aside buffer is used to access page with
         diagram.   **(10 Marks)**

Module-3

5   a. Draw backplane multiprocessor system and illustrate it with board and bus connections and
         usage.   **(10 Marks)**
     b. Distinguish the following with respect to master and slave communication with a timing
         diagram.
         i)   Broad call and broadcast
         ii) Synchronous and Asynchronous timing.   **(10 Marks)**

OR

6   a. Demonstrate block replacement of caches by direct mapping cache method with diagram.
                                                                                            (10 Marks)
     b. Define memory interleaving, with diagram. Explain m-way interleaving with respect to low
         order and high-order.   **(10 Marks)**

Module-4

7 a. Explain cross-point switch design with neat diagram. **(10 Marks)**
    b. Distinguish Omega networks without blocking and with blocking. **(10 Marks)**

OR

8 a. Illustrate synchronization mechanism using state diagram by write through, write back.
    (10 Marks)
    b. List and explain vector instruction types. **(10 Marks)**

Module-5

9 a. Briefly explain 5 programming models used in parallel programming. **(10 Marks)**
    b. In detail explain optimizing compilers for parallelism. **(10 Marks)**

OR

10 a. Discuss a model of a typical processor with diagram. **(10 Marks)**
     b. Demonstrate Tomasulo's algorithm with suitable example. **(10 Marks)**

* * * * *