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Total No. of Pages : 01

Total No. of Questions : 08

**M.Tech.(IT) (2015 & Onwards)/(CSE Engg.)/(E-Security) (Sem.-1)**

**ADVANCED COMPUTER ARCHITECTURE**

**Subject Code : CS-505**

**Paper ID : [E0685]**

**Time : 3 Hrs.**

**Max. Marks : 100**

**INSTRUCTION TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1.
  - a. Explain the Equal Duration computation model for the multiprocessors.
  - b. Explain the various applications of vector processors.
2. Assume that a simple addition of two elements requires a unit time. You are required to compute the execution time needed to perform the addition of a  $40 \times 40$  elements array using each of the following arrangements :
  - a. A SIMD system having 64 processing elements connected in nearest-neighbor fashion. Consider that each processor has only its local memory.
  - b. A SIMD system having 64 processing elements connected to a shared memory through an interconnection network. Ignore the communication time.
  - c. A MIMD computer system having 64 independent elements accessing a shared memory through an interconnection network. Ignore the communication time.
3. Compare the following :
  - a. Cluster and grid computing.
  - b. Pipelined and Superscalar Processors.
4. Superscalar processors allow faster CPU throughput due to instruction level parallelism. Explain the working of superscalar processors with the help of proper illustrations.
5. Explain the following :
  - a. Vector Architecture
  - b. Array Processors
6. What is simultaneous multithreading? Explain various multithreading techniques.
7. Explain the decisions and transformations to be considered to obtain unrolled code in loop unrolling and scheduling.
8. Define Computer Architecture with the help of a diagram. Outline major challenges and issues in the design of multi-threaded architectures.