Code No: RR320501 **Set No. 1**

III B.Tech Supplimentary Examinations, Aug/Sep 2008
ADVANCED COMPUTER ARCHITECTURE
(Common to Computer Science & Engineering, Information Technology and Computer Science & Systems Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Briefly explain the characteristics of memory devices in a memory hierarchy what is memory interleaving?
   (b) Differentiate between high-order and low-order memory interleaving. [8+8]
2. (a) Classify pipeline processors according to the levels of processing giving examples of each class.
   (b) What are reservation tables in the context of pipelines? Why are they required? Give a sample pipeline with both feedforward and feedback connections and show how a reservation table is created for it. [8+8]
3. (a) Discuss the issues involved for Inter− PE Communication in array processors.
   (b) What is a Multistage Network? Describe different types of multistage network. [8+8]
4. (a) Describe various associative search operations.
   (b) Describe data routing, comparison and interchange operations performed in the M(4,2) sorting algorithm with an example. [8+8]
5. (a) Design 8 x 8 omega network with 2 x 2 switches.
   (b) Distinguish the performance of delta network and crossbars. [8+8]
6. (a) Explain the L-M memory organization for a multiprocessor system, with the help of a diagram.
   (b) Describe language features that can exploit parallelism in multiprocessor environment. [8+8]
7. (a) Discuss the advantages and potential problems associated with the data flow Computers.
   (b) Explain in detail about the architecture of Dennis data flow machine. [8+8]
8. (a) Explain the Cray X-MP architecture.
   (b) How multitasking is done in Cray X-MP ? Explain. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR320501 **Set No. 2**

III B.Tech Supplimentary Examinations, Aug/Sep 2008
ADVANCED COMPUTER ARCHITECTURE
(Common to Computer Science & Engineering, Information Technology and Computer Science & Systems Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Describe some important applications of on parallel processing.
   (b) Descirbe Feng's classification. [8+8]
2. (a) Give the different classifications of pipeline processors.
   (b) Describe the typical pipeline structure of a CPU. [8+8]
3. (a) What are the parameters that characteristics SIMD computers ?
   (b) What is masking. Explain masking mechanism.
   (c) Analyse the various components in a Processing Element of an array processor. [5+6+5]
4. Explain the following terminologies associated with SIMD computers
   (a) Lock-step Operations.
   (b) Associative Memory.
   (c) Adjacency search.
   (d) Bit serial Associative Processor. [16]
5. (a) Design 8 x 8 omega network with 2 x 2 switches.
   (b) Distinguish the performance of delta network and crossbars. [8+8]
6. (a) Explain briefly the requirements of operating system for multiprocessors.
   (b) What is a separate supervisor operating system ? List its characteristics,advantages and shortcomings. [8+8]
7. (a) Explain a square systolic array for L-U decomposition.
   (b) Describe a matrix Arithmetic architecture processor. [8+8]
8. (a) Give the Inter CPU Communication structure of Cray X-MP System.
   (b) Describe the functions of solid state storage device of the I/O Sub system of a Cray X-MP. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR320501 **Set No. 3**

III B.Tech Supplimentary Examinations, Aug/Sep 2008
ADVANCED COMPUTER ARCHITECTURE
(Common to Computer Science & Engineering, Information Technology and Computer Science & Systems Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Explain the fast computation applications in the following areas.
   (a) Energy Resources exploration.
   (b) Medical, Military and Basic Research. [8+8]
2. (a) Give the different classifications of pipeline processors.
   (b) Describe the typical pipeline structure of a CPU. [8+8]
3. (a) With a neat diagram, Explain the connection mechanism of an 8*8 Bene's Network.
   (b) Describe 2*2 switching box and its four inter-connection states.
   (c) Differentiate between stage control and switch control . Give their relative importance. [8+4+4]
4. (a) Describe any two associative searching algorithms.
   (b) Explain the architecture of STARAN associative processor. [8+8]
5. (a) Give the architecture of K-map in Cm* architecture. With a diagram explain how an intracluster memory access is performed?
   (b) What is a cluster? How communication is possible between clusters? Explain. [8+8]
6. (a) Describe with a suitable diagram , the dynamic coherence check configuration to avoid cache coherence.
   (b) What are problems that occur while multiple processor are shared?
   (c) Gives the assumption usually made regarding regarding sections. [8+4+4]
7. (a) Explain any two VLSI arithmetic modules for matrix computation.
   (b) Explain the VLSI computing module for the inversion of a triangular matrix. [8+8]
8. (a) What are the 3 sections which characterize the Cray − I computer system and explain each section with diagrams.
   (b) What are the functional pipeline units in Cray − I. Explain the concept of pipeline chaining and vector loops. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR320501 **Set No. 4**

III B.Tech Supplimentary Examinations, Aug/Sep 2008
ADVANCED COMPUTER ARCHITECTURE
(Common to Computer Science & Engineering, Information Technology and Computer Science & Systems Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Explain Flynn's computer classification in detail with suitable block diagrams.
   (b) Differentiate between WORD-Slice processing and bit-slice processing.
   (c) A Computer system can be characterized by $T(C) =< K \times K', D \times D', W \times W' >$ What are these six entities ? [6+6+4]
2. (a) Differentiate between linear and nonlinear piplines. Give their sample pipeline structures and reservation tables.
   (b) Explain internal forwarding techniques with examples. What are its advantages? [8+8]
3. Explain Cube Interconnection Network with 8 nodes and give its routing functions. [16]
4. (a) Compare the two types of Associative Processor organizations.
   (b) Differentiate between Bit-slice and Word-slice operations in STARAN. [10+6]
5. (a) Explain the crossbar switch organization for a multiprocessor system. Also give the structure of a cross bar network.
   (b) Briefly describe the following terms associated with a multiprocessor system
      i. Context switching.
      ii. Semaphore for synchronization. [10+6]
6. (a) List the major characteristics, advantages and shortcomings of three types of multiprocessor operating systems.
   (b) List the four main sources of performance degradation of the dynamic coherence check algorithm. [12+4]
7. (a) Differentiate between dependence driven and multi level event driven approach of designing data flow systems.
   (b) Explain the functional design of a processor element in the EDDY system. [8+8]
8. (a) Describe the criteria for evaluation of computer systems. Give their importance.
   (b) Describe a Stochastic model of a computer system that can used for evaluation. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆