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Printed Pages – 4

CS – 702

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1010

Roll No.

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B.Tech

SEVENTH SEMESTER EXAMINATION, 2005-2006

COMPUTER ARCHITECTURE

Time : 3 Hours

Total Marks : 100

- Note :** (i) Answer *ALL* questions.
(ii) All questions carry equal marks.
(iii) Be precise in your answer.

1. Attempt *any four* of the following : (5x4=20)

- (a) With the help of block diagram describe the Flynn's classification. Give an example of each type.
- (b) Describe with merits and demerits the Feng's classification.
- (c) Make a comparative view of the salient features of some of the parallel computers.
- (d) State Amdah' Law. Show the derivation of speed ratio with variation of number of processor with reference to the fraction of series component in parallel computation.

- (e) Define and illustrate the following quantities. Efficiency, Redundancy and Utilization factor with reference to performance measure in parallel computing
- (f) Draw the variation of efficiency, redundancy and utilization factor qualities of parallel computing in $Q_{s(e)}$ with respect to number of processors.

2. Answer *any four* of the following : (5x4=20)

- (a) Explain the terms "hit ratio" and "miss ratio". Show the variation hit ratio with block sizes.
- (b) Derive an expression for the effective access time t_a for the five level of memory hierarchy in terms of hit ratio.
- (c) What is Cache ? Describe any two methods of Cache mapping to main memory.
- (d) Describe the super scalar architecture with salient features.
- (e) Describe the block diagram of a shared memory architecture. Enumerate its salient features.
- (f) Explain the terms FIFO, LIFO and LRU.

3. Answer *any two* of the following : (10x2=20)

- (a) Explain the term "Instruction and Arithmetic pipelining" with examples. Enumerate the salient features of pipeline architecture.

- (b) Determine the Minimum Average Latency (MAL) and through put of the following Instruction pipelining shown in the reservation table.

Reservation Table

S ₁	X				X		
S ₂		X					X
S ₃		X		X		X	
S ₄		X				X	
S ₅	X		X				X
	t ₁	t ₂	t ₃	t ₄	t ₅	t ₆	t ₇

- (c) Discuss the hazard and hazards detentions in the memory systems used in pipelines with example.

4. Answer *any two* of the following : (10x2=20)

- Show the parallel addition in a hypercube and 2 D mesh.
- Describe a method for the parallel multiplication. Enumerate the time complexity of the algorithm.
- Discuss the tightly coupled and loosely coupled multiprocessor architecture with block diagrams.

5. Answer *any two* of the following : (10x2=20)

- Discuss the various elementary permutations used in interconnection networks.

- (b) (i) Describe the different modes in routing in a hypercube.
- (ii) Describe the crossbar network architecture.
- (c) Write short notes on following :
 - (i) Data manipulator.
 - (ii) VLIW processors.