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.

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

Reservation Table

	t_1	t_2	t_3	t_4	t_5	t_6	t_7
S_1	X				X		
S_2		X					X
S_3		X		X		X	
S_4		X				X	
S_5	X		X				X

(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)

(a) Show the parallel addition in a hypercube and 2 D mesh.

(b) Describe a method for the parallel multiplication. Enumerate the time complexity of the algorithm.

(c) Discuss the tightly coupled and loosely coupled multiprocessor architecture with block diagrams.

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

(a) 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.

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