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CS/M. Tech (CSE)/SEM-1/CSEM-102/2012-13

2012 ADVANCED COMPUTER ARCHITECTURE & OPERATING SYSTEMS

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A (Multiple Choice Type Questions)

1. Choose the correct alternatives for the following:

 $10 \times 1 = 10$

- i) Shell is the exclusive feature of
 - a) UNIX

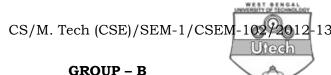
- b) DOS
- c) System software
- d) Application software.
- ii) A program in execution is called
 - a) Process
- b) Instruction
- c) Procedure
- d) Function.
- iii) The scheduling in which CPU is allocated to the process with least CPU-burst time is called
 - a) Priority Scheduling
 - b) Shortest job first Scheduling
 - c) Round Robin Scheduling
 - d) Multilevel Queue Scheduling.

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iv)	The minimum number of operands with any instruction							
	is			In Photograp (V Executings 2nd Explored				
	a)	1	b)	0				
	c)	2	d)	3.				
v)	The principal of locality justifies the use of							
	a)	interrupts	b)	DMA				
	c)	polling	d)	cache momory.				
vi)	How many address bits are required for a space memory?							
	a)	1024	b)	5				
	c)	10	d)	None of these.				
vii)	Cache memory is used to increase the speed of							
	a)	hard disk	b)	CPU				
	c)	floppy disk	d)	None of these.				
viii)	nto groups of equal size							
	a)	page	b)	tag				
	c)	block	d)	index.				
ix)	x) Maximum n bit 2's complement number is							
	a)	$2^{\wedge}n$	b)	$2^{}n-1$				
	c)	$2^{\wedge}(n-1)-1$	d)	cannot be set.				
x)	Micro instructions are kept in							
	a)	main memory	b)	control memory				
	c)	cache memory	d)	none of these.				



(Short Answer Type Questions)

Answer any three of the following. $3 \times 5 = 15$

- 2. Define Speed-up of a pipeline processor. a)
 - Deduce the maximum speed-up of a k-stage linear b) pipeline.
 - Is this speed-up always fully achievable? 1 + 3 + 1c)
- 3. What do you mean by Crypto system? a)
 - What do you mean by deadlock? Give example. b) 3 + 2
- 4. Differentiate between single-stage and multi-stage a) networks.
 - Develop the mesh connected ILLIAC IV interconnection b) network for 16 PEs? 2 + 3
- Compare and contrast between multi-processor systems and 5. multicomputer systems. What are the merits and demerits of RISC machines? 2 + 3

GROUP - C

(Long Answer Type Questions)

 $3 \times 15 = 45$ Answer any *three* of the following.

- 6. Explain with neat diagram and example the Remote Procedure calls. 5 + 10
- 7. a) What are the different parameters used to measure the performance of processors? Discuss briefly.

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- b) Suppose computers M1 and M2 are two implementations of the same instruction set. M1 has a clock rate of 50 MHz and M2 has a clock rate of 75 MHz. M1 has a CPI of 2.8 and M2 has a CPI of 3.2 for a given program. How many times faster is M2 than M1 for this program?
- c) Consider the following reservation table for a unification pipeline.

	0	1	2	3	4	5	6	7	8	→ Time
S1	X								X	
S2		X	X					X		
S3				X						
S4					X	X				
S5							X	X		

Calculate Forbidden List, Collision Vector, Greedy Cycle and MAL. 4 + 3 + 8

- 8. a) What is cache coherence problem? Discuss about one software protocol for this problem. 2 + 3
 - b) What is the "inclusion property" of memory hierarchy?

 What is meant by cache miss penalty? Briefly discuss about "carly restart" technique to reduce it. 1 + 1 + 3
 - c) What is/are objective (s) of data flow computers?Compare it with control flow architecture. 2 + 3
- 9. Write short notes on any *three* of the following: 3×5
 - a) Distributed File System
 - b) Lamport's Distributed Mutual Exclusion Algorithm
 - c) Ricart Agrawala Algorithm
 - d) SUN Network File System.

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