



Name :

Roll No. :

Invigilator's Signature :

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 × 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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GROUP – B

(Short Answer Type Questions)

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

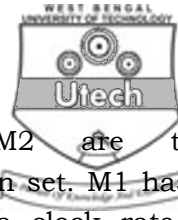
2. a) Define Speed-up of a pipeline processor.
b) Deduce the maximum speed-up of a k -stage linear pipeline.
c) Is this speed-up always fully achievable ? $1 + 3 + 1$
3. a) What do you mean by Crypto system ?
b) What do you mean by deadlock ? Give example. $3 + 2$
4. a) Differentiate between single-stage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

GROUP – C

(Long Answer Type Questions)

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

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.



- 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 “early 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
- Distributed File System
 - Lamport’s Distributed Mutual Exclusion Algorithm
 - Ricart Agrawala Algorithm
 - SUN Network File System.