



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech(ECE-NEW)/SEM-7/EC-704A/2009-10

2009

**SYSTEMS PROGRAMMING & OPERATING
SYSTEM**

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 of the following : $10 \times 1 = 10$

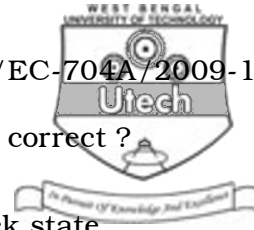
i) Compaction is the solution for

a) internal fragmentation

b) external fragmentation

c) mutual exclusion

d) both (a) and (b).



vii) Which of the following statements are correct ?

- I. A safe state is not a deadlock state
- II. A deadlock state is an unsafe state
- III. Not all unsafe states are deadlocks.

Of the statements :

- a) All are correct
- b) I and II are correct
- c) II and III are correct
- d) I and III are correct.

viii) Optimizing transformation is a rule for rewriting a program to improve its

- a) execution efficiency b) execution timing
- c) both (a) and (b) d) can't say.

ix) The difference between semantic of application domain and execution domain is known as

- a) semantic gap b) serial gap
- c) sequential gap d) none of these.



- x) A dead code can be omitted from a program
- a) affecting the result
 - b) without affecting the result
 - c) may or may not affect result depending upon criteria of the program
 - d) none of these.

GROUP – B

(Short Answer Type Questions)

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

2. a) What is an operating system ?
- b) Differentiate between batch processing and multitasking operating system.
- c) What is context switching ? $2 + 2 + 1$
3. a) What is a boot strap loader ?
- b) Differentiate between worm and virus.
- c) What is page fault ? $2 + 2 + 1$
4. What is process ? What are the different states of a process ? Distinguish thread and a process ? $1 + 2 + 2$
5. What is Thrashing ? Why do page fault occur ? $2 + 3$



6. “A safe state never be in deadlock, but an unsafe state may enter in deadlock”. Justify the statement.

GROUP – C

(Long Answer Type Questions)

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

7. a) Explain the concept of simple paging system with diagram.
- b) How does an Operating System view processes ? Explain the process Control Block (PCB) in this context with diagram.
- c) Write an assembly language program (8086 based) to find the average of two numbers. $6 + 4 + 5$
8. a) What is a semaphore ? Solve the producer-consumer using semaphore.
- b) Explain with diagram, the Pass-I of a 2-pass assembler. What data structures are required for this purpose ?
- c) Explain the concept of dynamic linking and loading.

$6 + 5 + 4$



9. a) What are the characteristics of a real time operating system ?

b) Explain the general model a compiler in brief. What is lexical analysis ?

c) Briefly explain the operation of a relocating loader.

3 + 7 + 5

10. Why are the page sizes always power of 2 ? Explain the concept of demand paging. What is swapping ? Why are segmentation and paging sometime considered into one scheme ? Discuss the following page replacement algorithm :

LRU, FIFO and optimal and compare their characteristics.

2 + 2 + 2 + 3 + 6

11. What are the merits and demerits of different types of inter-process communication schemes ? What do you understand by co-operating of process ? Briefly discuss the Producer Consumer Problem. Why is protection necessary ? What are the main differences between capability lists and access lists ?

4 + 2 + 4 + 3 + 2



12. Write short notes on any *three* of the following : 3 × 5

- a) Message passing system
 - b) Page replacement policies
 - c) Resident and cross-compiler
 - d) Dining philosopher problem
 - e) Time Sharing system
 - f) Round robin scheduling algorithm
 - g) Spooling.
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