



Name :

Roll No. :

Invigilator's Signature :

CS/B.TECH(CSE/IT)/SEM-5/CS-501/2011-12

2011

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 for any *ten* of the following :

10 × 1 = 10

i) Time Sharing Operating system has

- a) high throughput b) low execution time
- c) faster I/O d) none of these.

ii) Which of the following schemes suffers from External Fragmentation ?

- a) Segmentation b) Paging
- c) Paged segmentation d) All of these.



- iii) Main function of linker is
- a) Relocation
 - b) Linking
 - c) (a) & (b)
 - d) Loading.
- iv) Part of a program where the shared memory is accessed and which should be executed indivisibly, is called
- a) semaphores
 - b) directory
 - c) critical section
 - d) mutual exclusion.
- v) Moving process from main memory to disk is called
- a) Caching
 - b) Termination
 - c) Swapping
 - d) Interruption.
- vi) The page fault frequency in virtual memory is reduced when
- a) the page size is reduced
 - b) processes are unbound
 - c) locality of reference is applicable to the process
 - d) none of these.

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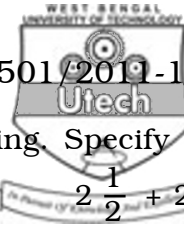
- xi) Under which of the following situations CPU scheduling decision takes place ?
- a) When a process switches from running state to waiting state
 - b) When a process switches from running state to ready state
 - c) When a process switches from waiting state to ready state
 - d) All of these.
- xii) If a process has 24 k bytes logical address space and the page size is 4096 bytes then the number of frames of that process is
- a) 12
 - b) 6
 - c) 8
 - d) 16.

GROUP – B

(Short Answer Type Questions)

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

- 2. Describe the task of long term short term and medium term scheduler.
- 3. Describe the two basic operations on semaphore. Explain whether any integer variable with similar operations can act as semaphore or not. $3 + 2$



4. Mention the basic principle of RR scheduling. Specify the impact of time quantum on its performance. $2\frac{1}{2} + 2\frac{1}{2}$
5. What is program probability ? Specify the difference between static and dynamic relocation ? $2 + 3$
6. Describe physical and logical formatting of Disk.

GROUP – C

(Long Answer Type Questions)

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

7. a) What are the problems of busy-wait implementation of semaphore ? Explain, how it is solved.
- b) What is message ? Write down a message based solution for producer / consumer problem with bounded buffer. $6 + 9$
8. a) Write down the merits and demerits of a virtual memory system.
- b) Consider a virtual memory system with combined implementation, segmentation and paging. Describe the address translation scheme along with necessary data structures. $6 + 9$



9. a) What is PCB ? Mention its content.
- b) Consider a paged memory system. Specify, what information will be stored in PCB to support memory management.
- c) What is the difference between context switching and mode switching ?
- d) Compare best fit and first fit algorithm for memory allocation.
- e) Compare SSTF and C-SCAN algorithm in the context of disk scheduling. $3 + 3 + 3 + 3 + 3$
10. a) What is deadlock ? Describe the necessary and sufficient conditions for the occurrence of deadlock.
- b) Describe the deadlock prevention strategies.
- c) What are safe and unsafe states ? $6 + 6 + 3$



11. Write short notes on the following :

- a) Inode
- b) Working set theory
- c) Content of a process
- d) Belady's anomaly.

4 + 5 + 3 + 3

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