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06EC751

Seventh Semester B.E. Degree Examination, Dec.09-Jan.10
Operating Systems

Time: 3 hrs.

Max. Marks:100

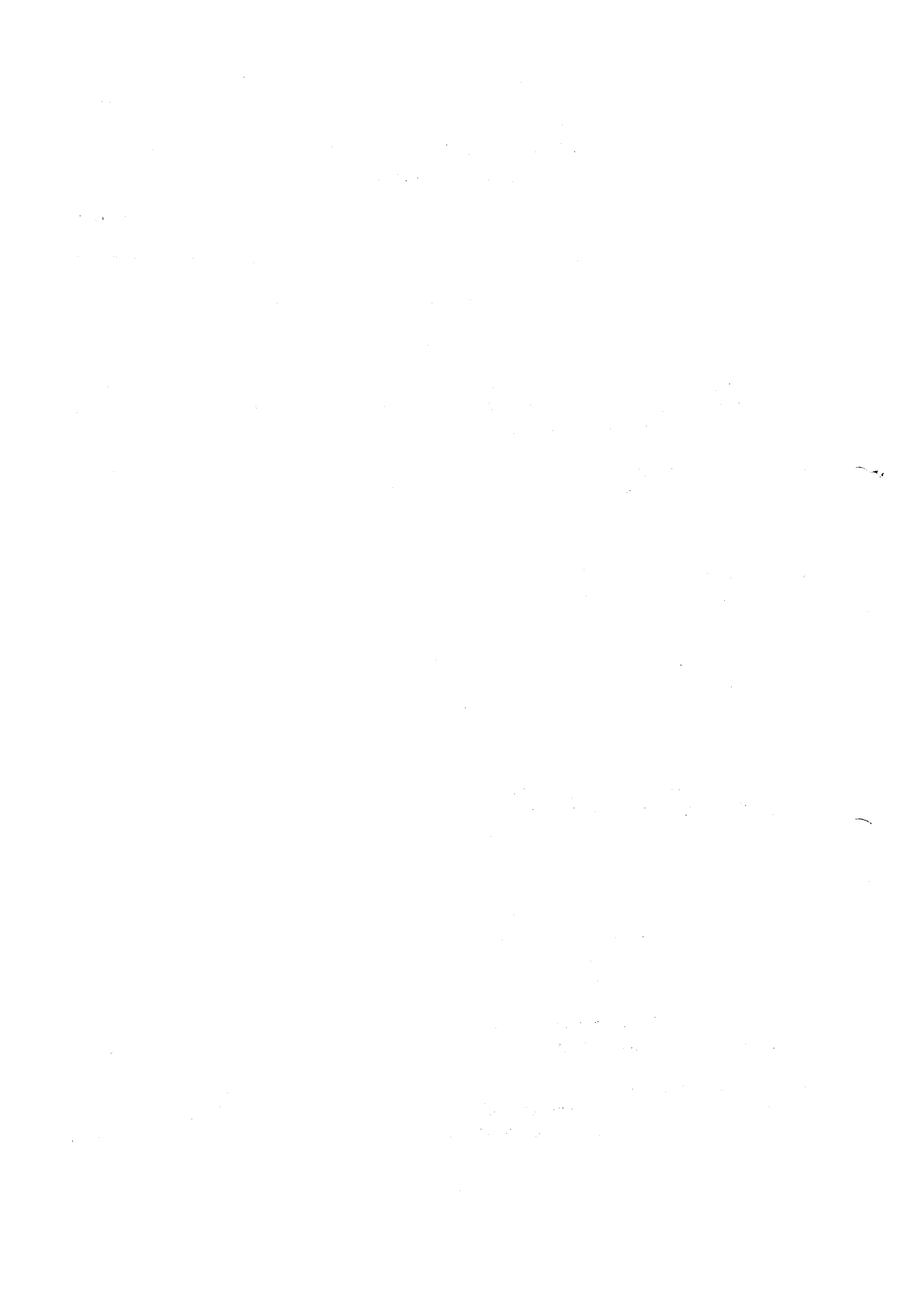
- Note:1. Answer any FIVE full questions, selecting not more than THREE from each part.**
2. Draw diagrams wherever necessary.

PART – A

- 1
 - a. Mention the key concerns and common tasks performed by OS. (08 Marks)
 - b. With diagram, explain the model of a computer system as viewed by an OS. (08 Marks)
 - c. What are the classes of OS? Explain any one. (04 Marks)
- 2
 - a. Explain how to configure and install supervisor. (08 Marks)
 - b. Explain i) Kernel based operating system ii) Micro kernel based operating system. (08 Marks)
 - c. Explain the concept of semantic gap. (04 Marks)
- 3
 - a. Explain Kernel level threads and user level threads. (08 Marks)
 - b. Explain the event handing actions of kernel. (08 Marks)
 - c. Explain the process state transitions in Unix. (04 Marks)
- 4
 - a. Explain i) lazy buddy allocator ii) slab allocator. (08 Marks)
 - b. Explain merging of free areas using boundary tags. (08 Marks)
 - c. Compare continuous and non continuous memory allocation. (04 Marks)

PART – B

- 5
 - a. Explain demand loading of pages. (08 Marks)
 - b. Given the reference to the following pages by a program 0, 9, 0, 1, 8, 1, 8, 7, 8, 7, 1, 2, 8, 2, 7, 8, 2, 3, 8, 3 how many page faults will occur if the program has 3 page frames available to it and uses LRU policy. (08 Marks)
 - c. Explain page sharing. (04 Marks)
- 6
 - a. Explain file system and IOCS layers. (08 Marks)
 - b. Explain linked allocation and indexed allocation. (08 Marks)
 - c. Explain Unix file system. (04 Marks)
- 7
 - a. Explain scheduling in Unix. (08 Marks)
 - b. Explain i) Round robin scheduling ii) Priority based scheduling. (08 Marks)
 - c. Explain mechanism and policy modules of process scheduler. (04 Marks)
- 8
 - a. Explain mail boxes. (08 Marks)
 - b. Explain i) direct and indirect naming ii) blocking and non blocking sends. (08 Marks)
 - c. Explain inter process message control box. (04 Marks)



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Seventh Semester B.E. Degree Examination, May/June 2010
Operating Systems

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Explain the batch processing system, with figures. In a batch processing system, the results of 1000 students are to be printed. Reading a card or printing a result needs 100 msec whereas read/write operation in a disk needs only 20 msec. Processing a record needs 10 msec of CPU time. Determine the total time taken, CPU idle time and speed of the reading operation with and without spooling technique. (08 Marks)
- b. Describe the scheduling and memory management techniques in a time sharing operating system. Determine the efficiency and user response time of the system, if the time slice used is 5 msec and context switching time is 120 microseconds, when the number of active users is 6. The process P₁ has a CPU burst of 20 msec and an I/O operation of 120 msec and the process P₂ has a CPU burst of 18 msec and I/O operation of 60 msec. Write the timing diagrams and scheduling table. (12 Marks)
- 2 a. Explain
 - i) functions of an operating system
 - ii) Microkernel operating system. (08 Marks)
- b. Describe the operation of the operating system while processing an I/O interrupt, with a detailed block diagram. How the memory protection violation interrupt is generated? Explain with an example and figure. (12 Marks)
- 3 a. Describe with diagrams: (i) kernel level threads (ii) process state transitions. (08 Marks)
- b. Describe race condition and analyze the different cases in air reservation system, when the total seating capacity is 200. The last seat number 200 is to be allocated in a multiprocessing system, sharing the common database. Explain any one remedy for the problem encountered. Write the relevant algorithms. (12 Marks)
- 4 a. Differentiate between :
 - i) Static and dynamic memory allocation
 - ii) First-fit and best-fit free space allocation. (08 Marks)
- b. Describe fixed and variable partitioned, contiguous memory allocation schemes along with their merits and demerits. Also, explain memory compaction/relocation used in these schemes. (12 Marks)

PART – B

- 5 a. Explain paged allocation scheme along with the address translation method. Determine the unknown values in logical and physical address space, if the main memory size is 1 Mbyte and is partitioned into 64 equal parts. The number of pages in the logical address space is 2048. (08 Marks)

- 5 b. Describe FIFO and LRU page replacement policies, their features, merits and demerits, with respect to the following example: Alloc = 3 and Alloc = 4 frames
All pages are initially empty and the first page referred itself causes a page fault.
Page reference string : 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5
Reference time string: $t_1, t_2, t_3, \dots, t_{13}$. (12 Marks)

- 6 a. Differentiate between :
i) Sequential and direct file organization
ii) Linked and indexed disk space allocation. (08 Marks)
- b. Describe file system operation during open, a file operation and close operation. (12 Marks)

- 7 a. Compare
i) Long term and short term schedulers
ii) Preemptive and non-preemptive scheduling
iii) User mode and supervisor mode. (08 Marks)
- b. Describe SRN/SJN and LCN scheduling policies and determine average turn around time, average waiting time and equations/formulae along with scheduling table for the following example: (12 Marks)

Process	Arrival time in msec	Execution time in msec	Deadline in msec
P ₁	0	3	4
P ₂	2	3	14
P ₃	3	2	6
P ₄	5	5	11
P ₅	8	3	12

- 8 a. Describe the issues in message passing and also direct and indirect naming techniques. (08 Marks)
- b. Describe the delivery of interprocess messages along with algorithm for send and receive operations. What are the advantages of mailboxes? (12 Marks)

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