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10TE751

**Seventh Semester B.E. Degree Examination, Dec.2017/Jan.2018**  
**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 various goals of an operating system. (06 Marks)  
b. With a neat diagram, explain time sharing operating system with an emphasis on scheduling. (08 Marks)  
c. What are the key concepts and techniques used in distributed operating system? (06 Marks)
- 2 a. Explain various operations performed by an OS. (06 Marks)  
b. With the help of a figure explain operating system with monolithic structure. (06 Marks)  
c. Explain structure of kernel based OS and micro kernel based OS. (08 Marks)
- 3 a. Explain all the fields of process control block. (08 Marks)  
b. With a state transition diagram, explain various states a process can take and its transition. (08 Marks)  
c. What are the advantages of threads over processes? (04 Marks)
- 4 a. Define : i) Memory fragmentation ii) External fragmentation  
iii) Internal fragmentation iv) Memory compaction. (04 Marks)  
b. Compare contiguous and non-contiguous memory allocation. (06 Marks)  
c. Explain three kernel memory allocators. (10 Marks)

**PART – B**

- 5 a. Explain demand loading of a page with the help of a figure clearly showing MMU and VMM actions. (08 Marks)  
b. Define : i) page fault ii) page-in iii) page-out iv) page replacement. (04 Marks)  
c. Consider the following page reference and reference time strings for a process.  
Page reference string : 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5  
Reference time string :  $t_1, t_2, t_3, t_4, t_5, t_6, t_7, t_8, t_9, t_{10}, t_{11}, t_{12}, t_{13}$   
Take  $alloc_i = 3$  which is the number of page frames a memory can hold at any time.  
Determine the number of page faults using :  
i) FIFO page replacement policy  
ii) LRU page replacement policy  
Clearly show the contents of memory at every reference time and mark page faults. (08 Marks)
- 6 a. What are the two types of files? Explain briefly. (05 Marks)  
b. Explain operations on files. (07 Marks)  
c. Explain Linked allocation of disk space and Indexed allocation of disk space. (08 Marks)

- 7 a. For the processes shown below :

Process	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>
Admission time	0	2	3	4	8
Service time	3	3	5	2	3

Find mean turn around time and weighted turn around using i) FCFS scheduling policy (12 Marks)

ii) SRN scheduling policy iii) RR scheduling policy. (04 Marks)

- b. Explain approaches to real time scheduling. (04 Marks)

- c. Define :

- i) Service time
- ii) Response ratio
- iii) Deadline overrun
- iv) Preemption.

(04 Marks)

- 8 a. Explain blocking and non blocking send statements. (04 Marks)

- b. What are the exceptional conditions in message passing and how these are handled by kernel? (08 Marks)

- c. Write short notes on mailboxes. (08 Marks)

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