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10TE751

Seventh Semester B.E. Degree Examination, April 2018
Operating Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. What is an operating system? What are the goals of an operating system? **(10 Marks)**

b. What are the special techniques and advantages of the distributed operating system? **(10 Marks)**

2 a. Explain layered operating system structure. **(07 Marks)**

b. Explain the Microkernel based as structure. **(07 Marks)**

c. A payroll program reads monthly attendance details of 1000 employees and prints their payroll. Reading of a card and printing of a line consumers 100 milliseconds each, while a read or write operation on a disk costumers 10 milliseconds. Salary processing consumes 5 milliseconds of CPU time per employee. Find out elapsed time and CPU idle times with and without spooling. **(06 Marks)**

3 a. Define a process? Explain the fundamental state transition for a process? **(08 Marks)**

b. Explain kernel level threads and user level threads. **(06 Marks)**

c. Define PCD and explain the contents of PCD. **(06 Marks)**

4 a. Explain the concept of memory protection using :
   i) Bound register
   ii) Memory protection. **(08 Marks)**

b. Compare contiguous and non – contiguous memory allocation. **(06 Marks)**

c. Explain internal and external fragmentation with examples. **(06 Marks)**

PART – B

5 a. Explain the technique of page faults and page replacement used in demand paging. **(06 Marks)**

b. Describe the functions of VM handler. **(06 Marks)**

c. Show the behaviour of the FIFO page replacement policy for the following page reference and reference time for a program.
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}
Show how many page faults would occur for FIFO replacement assuming 3 and 4 frames. **(08 Marks)**

6 a. Explain the concept of RAID with a schematic diagram. **(10 Marks)**

b. Write a short note on allocation of disk space. **(10 Marks)**

7 a. Explain long term, medium term and short term schedulers. **(10 Marks)**

b. Determine mean turnaround time and weighted turnaround time for SJN and RR scheduling, assuming a time slice of 1 sec for the following table :

Process	P_1	P_2	P_3	P_4	P_5
Arrival time	0	2	3	5	9
Service time	3	3	2	5	3

(10 Marks)

8 a. Write a short note on mail box. **(08 Marks)**

b. Explain pipes and message queues in UNIX. **(06 Marks)**

c. Explain :

i) Symmetric and asymmetric naming

ii) Blocking and non–blocking protocols. **(06 Marks)**

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