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10EC65

Sixth Semester B.E. Degree Examination, June/July 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. What resource allocation function? Explain the strategies for resource allocation. **(04 Marks)**
   b. With a neat block diagram of a model of a computer system, explain the program status word. **(08 Marks)**
   c. Why I/O bound programs should be given higher priority in a multiprogramming system? Illustrate with timing diagram. **(08 Marks)**

2 a. Explain the layered structure of operating system. How it is superior compared to monolithic structure? **(04 Marks)**
   b. What is virtual machine operating system? Explain VM/370 VMOS. **(08 Marks)**
   c. Explain the structure of microkernel based operating system. **(08 Marks)**

3 a. What are fundamental process states? Giver the state transition diagram of a process. **(04 Marks)**
   b. Explain the race condition in airline reservation system with an algorithm. **(08 Marks)**
   c. Explain control synchronization and need for control synchronization with an example. **(08 Marks)**

4 a. Explain memory allocation model for a process. **(04 Marks)**
   b. Discuss the techniques used to perform fresh memory allocation form a free list. **(08 Marks)**
   c. Explain the implementation of non contiguous memory allocation using segmentation. **(08 Marks)**

PART – B

5 a. What is virtual memory? How the virtual memory is implemented? **(04 Marks)**
   b. State and explain the principle of locality reference of a process. **(06 Marks)**
   c. A page reference string and reference timing string for a process P as follows :
   Page reference string   : 0, 1, 0, 2, 0, 1, 2 - - - - - -
   Reference timing string : $t_1, t_2, t_3, t_4, t_5, t_6, t_7$ - - - - -
   Illustrate the operation of optimal, FIFO and LRU page replacement policies.
   Assume there are 3 page frames allocated to process. **(10 Marks)**

6 a. What are the facilities provided by file system and IOCS? **(04 Marks)**
   b. Discuss the linked allocation and File allocation table of disk space in file system. **(08 Marks)**
   c. Explain File sharing semantics and disk space allocation in UNIX file system. **(08 Marks)**

7 a. Explain the fundamental technique of scheduling. (04 Marks)

   b. Explain the operation of HRN policy of non-preemptive scheduling scheme for the following table. How starvation is over come in this scheme. (10 Marks)

Processes	P_1	P_2	P_3	P_4	P_5
Arrival Time	0	2	3	4	8
Service Time	3	3	5	2	5

   c. List the main features of priority based scheduling and summarize its operations. (06 Marks)

8 a. What is message passing? Explain the issues in message passing. (04 Marks)

   b. Illustrate the message passing using mailbox and explain its advantages. (08 Marks)

   c. Discuss the inter process message communication in UNIX operating system. (08 Marks)

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