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Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Operating System

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 is an operating system? Explain abstract view of component of a computer system. **(07 Marks)**
    b. List the different services that an operating system provides. Explain. **(06 Marks)**
    c. Explain the concept of virtual machines. Bring out its advantages. **(07 Marks)**

2. a. What is a process? With a state diagram, explain states of a process. **(06 Marks)**
    b. Describe the implementation of IPC using shared memory and message passing. **(07 Marks)**
    c. Consider the following set of process.

Process	Arrival time	Burst time
P_1	0	6
P_2	2	3
P_3	4	3
P_4	5	5

    i) Draw the Gantt chart showing the execution of the following process FCFS, SRTF and RR (quantum = 1 m sec)
    ii) Compute the turnaround time, waiting time and average waiting time for each process. **(07 Marks)**

3. a. What is Busy waiting in a critical section concept? How semaphore is used to solve critical section problem? What are the advantages of semaphores? **(10 Marks)**
    b. What is a monitor? Explain the solution to the classical dining philospher's problem, using monitor. **(10 Marks)**

4. a. Explain Resource-Request algorithm. **(06 Marks)**
    b. What is a Deadlock? Briefly explain the methods for handling deadlocks. **(06 Marks)**
    c. Consider a system with five processes P_0 through P_4 and three resources A, B, C Resources A has ten instances, resources type B has five instance and resource type C has seven instances. Suppose that at time To the following snapshot of the system has been taken.

Processes	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

    (i) Is the system in a safe state?
    (ii) If a request from P_1 arrives for (1, 0, 2) can the request be granted immediately. **(08 Marks)**

PART – B

5 a. Give the difference between (i) Internal and external fragmentation (ii) Paging and segmentation. **(06 Marks)**
   b. Discuss the steps involved in handling page faults with diagram. **(06 Marks)**
   c. Consider the following page reference string,
      7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
      for a memory with three frames. How many page faults would occur for LRU, FIFO and optimal page replacement algorithm? Which is the most efficient among them? **(08 Marks)**

6 a. Explain the following (i) file types (ii) file operations (iii) file attributes **(12 Marks)**
   b. Explain the methods used for implementing directories. **(08 Marks)**

7 a. Suppose a disk drive has 5000 cylinders numbered 0 to 4999. Drive is currently serving request a cylinder 143 and previous request was at cylinder 125, queue of pending requests in FIFO order is 86, 1470, 913, 1774, 948, 1509, 1022, 1756, 130 starting from current head position, what is the total distances (in cylinder) that the disk arm moves to satisfy all pending request for FCFS, SSTF, LOOK and SCAN disk scheduling algorithm. **(10 Marks)**
   b. Explain access matrix with examples. **(05 Marks)**
   c. Explain the various questioning that arise in revocation of access rights. **(05 Marks)**

8 a. Distinguish between fork ( ) and clone ( ) system call. Also customize the clone ( ) system call to fork ( ) functionality with suitable modifications / settings. **(08 Marks)**
   b. Explain the Linux device drive with the block structure. **(12 Marks)**

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