Fifth Semester B.E. Degree Examination, Dec.2014/Jan.2015
Operating Systems

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. Differentiate between multiprogramming and multiprocessing.   **(05 Marks)**
    b. Explain the various functions of operating system with respect to process and memory management.   **(05 Marks)**
    c. What are the different ways in which the Pthread terminates?   **(05 Marks)**
    d. Explain any two facilities provided for implementing interacting process in programming language and operating system.   **(05 Marks)**

2   a. Differentiate between :
       i) User level and kernel level threads
       ii) Process and thread.   **(06 Marks)**
    b. Following is the snapshot of a cpu

Process	CPU Burst	Arrival time
P_1	10	0
P_2	29	1
P_3	03	2
P_4	07	3

Draw Gantt charts and calculate the waiting and turnaround time using FCFS, SJF and RR with time quantum 10 scheduling algorithms.   **(09 Marks)**
    c. Explain different scheduling criteria that must be kept in mind while choosing different scheduling algorithms.   **(05 Marks)**

3   a. Explain critical section problem. What are the requirements that critical section problem must satisfy?   **(05 Marks)**
    b. Explain Reader's – writers problem and provide a semaphore solution using semaphore's for reader's priority problem.   **(10 Marks)**
    c. What are monitors? Compare with semaphores with their relative advantages and disadvantages.   **(05 Marks)**

4 a. Consider a system containing m resources of the same type being shared by n processes. Resources can be requested and released by processes only one at a time. Show that the system is deadlock free if the following two conditions hold :
   i) The maximum need of each process is between 1 and m resources
   ii) The sum of all maximum needs is less than m + n. **(10 Marks)**

   b. For the given snapshot :

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_1	0	0	1	2	0	0	1	2	1	5	2	0
P_2	1	0	0	0	1	7	5	0				
P_3	1	3	5	4	2	3	5	6				
P_4	0	6	3	2	0	6	5	2				
P_5	0	0	1	4	0	6	5	6				

   Using Banker's algorithm :
   i) What is the need matrix content?
   ii) Is the system in safe state?
   iii) If a request from process P2(0, 4, 2, 0) arrivers, can it be granted? **(10 Marks)**

PART – B

5 a. What is locality of reference? Differentiate between paging and segmentation. **(05 Marks)**
   b. Explain the differences between :
   i) Logical and physical address space
   ii) Internal and external fragmentation. **(05 Marks)**
   c. For the following page reference calculate the page faults that occur using FIFO and LRU for 3 and 4 page frames respectively , 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5. **(10 Marks)**

6 a. What are the different techniques with which a file can be shared among users? **(06 Marks)**
   b. Given memory partitions of 100 k, 500 k, 200 k, 600 k (in order), which algorithm from best fit, worst fit and first fit places processes with requirements 212 k, 417 k, 112 k and 426 k in an efficient manner? . **(06 Marks)**
   c. Explain the various storage mechanisms available to store files, with neat diagram. **(08 Marks)**

7 a. Given the following queue 95, 180, 34, 119, 11, 123, 62, 64 with head initially at track 50 and ending at track 199 calculate the number of moves using FCFS, SSTF, Elevator and C look algorithm. **(12 Marks)**
   b. What are access matrices? Explain its implementation. **(04 Marks)**
   c. Differentiate between protection and security. **(04 Marks)**

8 a. Explain the different IPC mechanism available in Linux. **(08 Marks)**
   b. Explain how process is managed on Linux platform. **(08 Marks)**
   c. Write a brief note on the design principles of Linux. **(04 Marks)**

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