R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November - 2015
OPERATING SYSTEMS
(Common to CSE, IT)

Time: 3 hours   **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A (25 Marks)

1.a) What do you mean by Virtual Memory?   [2]
  b) Define multitasking   [3]
  c) What are the two separate and potentially independent characteristics embodied in the concept of process?   [2]
  d) Describe about race condition.   [3]
  e) What is the difference between page and segment?   [2]
  f) What do you mean by Thrashing?   [3]
  g) Define three blocking methods.   [2]
  h) What delay elements are involved in disk read or write?   [3]
  i) How can the hold-and-wait condition be prevented?   [2]
  j) What are the necessary and sufficient conditions to occur deadlock?   [3]

PART - B (50 Marks)

2.a) What system calls have to be executed by a command interpreter or shell in order to start a new process? Explain briefly.
  b) What are the main differences between operating systems for mainframe computers and personal computers?   [5+5]

OR

3.a) What is the relationship between a guest operating system and a host operating system in a system like VMware? What factors need to be considered?
  b) Define Essential properties of Distributed Operating Systems.   [5+5]

4.a) Explain process states.
  b) Explain the concept of semaphores. Illustrate with an example.   [5+5]

OR

5.a) Give Peterson solution for critical section problem.
  b) Consider the following set of process, with the length of the CPU burst given in milliseconds.   [3+7]

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P_1, P2, P3, P4, P5, all at time 0.
What is the turnaround time of each process by applying priority scheduling algorithm?

6.a) Differentiate Internal fragmentation and external fragmentation.
  b) What is Belady's anomaly? Explain with one example. [5+5]

OR

7. Consider the following page reference strings:
   1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6.
   How many page faults would occur for the following replacement algorithm, assuming three, four frames? Remember that all frames are initially empty, so your first unique pages will cost one fault each.
   a) LRU replacement
   b) Optimal replacement. [5+5]

8.a) Write about Swap space management.
  b) Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is: **86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130.** Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the SSTF disk scheduling algorithms? [4+6]

OR

9. Explain in detail about different file allocation methods. [10]

10. List the conditions that must be present for deadlock to occur and for each condition give brief example or reason that illustrate a disadvantage in preventing the condition. [10]

OR

11. State whether you agree or disagree with the following claim:
    The Banker's algorithm may fail to avoid deadlock if a resource breaks down. Justify your answer. [10]

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