C

APJ Abdul Kalam Technological University

Ernakulam Cluster II

Second Semester M.Tech Degree Examination May 2017

05CS 6006-OPERATING SYSTEM DESIGN CONCEPTS

Time: 3 hrs

Max.Marks:60

I.

    a) What should happen if the kernel attempts to awaken all processes sleeping on an event,but no processes are asleep on the event at the time of wake-up? (6 Marks)

    b) Define system throughput as the number of processes the system can execute in a given time period. Describe how buffer cache can help response time. Does it necessarily help system throughput? (6 Marks)

II.

    a) Describe the disadvantages of a regular structure of a file. Using the concept of indirect blocks, how can you access byte offset 35,000 of a single indirect block? (6 Marks)

    b) How can you improve the performance of a file system to search the i-node list for a free node? (6 Marks)

III

    a) Explain various components of a process and the mechanism used by UNIX kernel to organise and access these components. (6 Marks)

    b) When attaching a region to a process, how can the kernel check that the region does not overlap virtual addresses in regions already attached to the process? (6 Marks)

    c) Describe how the real and effective user Ids are assigned and used in the UNIX operating system. (6 Marks)

OR

IV

a) Describe the various parts of the context of a process.

(5 Marks)

b) Explain how the *sleep* and *wakeup* system calls work in UNIX operating System.

(7 Marks)

c) Design an algorithm that translates virtual addresses to physical addresses, given the virtual address and the address of the pregion entry. (6 Marks)

V

a) Discuss the working set of a process for window size of 2,3,4,5 for the following sequence of page   references.

   24,15,18,23,24,17,18,24,18,17,17,15,24,17,24,18 (9 Marks)

b) Discuss the interaction of a page-stealer process during memory swapping (9 Marks)

OR

VI

a) Discuss the concept of demand paging. (6 Marks)

b) Explain how driver interfaces are used in I/O sub-system. (6 Marks)

c) What are the system calls associated with the semaphores? (6 Marks)