

APJ Abdul Kalam Technological University
Ernakulam II Cluster

Second Semester M.Tech Degree Examination April/May 2018

05CS 6006- OPERATING SYSTEM DESIGN CONCEPTS

Time: 3hrs

Max Marks: 60

1. a) Describe the file subsystem of the UNIX operating system. (5 Marks)
b) What is the structure of the buffer pool maintained by the UNIX kernel for allocating buffer cache for file management? (7 Marks)
2. a) Write an algorithm that prints the owner, file type, account permission and access time of a file supplied as parameter. If the file is a directory, the program should read the directory and print the above information for all files in the directory. (7 Marks)
b) Distinguish between named and unnamed pipes. Explain how pipes can be used as a mechanism for communication between processes. (5 Marks)
3. a) When does the kernel duplicate the region of a process? Write the procedure for region duplication. (5 Marks)
b) Consider 3 processes A, B and C. They are created in the given order A, B, C. Initial priority of all three are 60. The clock interrupts the system 60 times in a second. Calculate the priorities of the process and show how the kernel schedules them for the first 5 seconds. (10 Marks)
c) How can a process send signals to other processes? (3 Marks)

OR

4. a) Describe the various states of a process. Also discuss about the data structures that hold the information regarding process states. (10 Marks)
b) How would the kernel, which is an idle state, knows that some process wants it to do something? (3 Marks)
c) Briefly explain system startup procedure. (5 Marks)

5. a) Design an algorithm *mfree*, which frees space and returns it to a *map*. (8 Marks)
- b) What do you mean by hybrid system? (4 Marks)
- c) Discuss different system calls associated with Semaphores. (6 Marks)

OR

6. a) Discuss the data structures used in demand paging. (8 Marks)
- b) Write algorithms for opening and closing of devices. (10 Marks)