DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Semester Examination – Summer - 2019

Branch: Computer Science & Engineering   **Sem.:-IV**
Subject with Subject Code:- Operating System (BTCOC403)   **Marks:60**
Date:-20/05/19   **Time:- 3 Hr.**

Instructions to the Students

1. Each Question carries 12 marks.
2. Attempt **any Five** Questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

Q (1) Attempt any four of the following.   12

(a) What is an Operating System? Give its purpose. How it works similar to government?

(b) How are network computers different from traditional personal computers? Why do some systems store the O.S. in firmware and other on disk?

(c) In what ways, is the moduler, kernel approach similar to the layered approach? In what ways, does it differ from layered approach?

(d) How does the distinguish between kernel mode function as a rudimentary form of protection or system security? Enlist all Operating System services.

(e) Explain the architecture of UNIX Operating System. What is System Administration? Describe the roles of all the members of System Administration.

Q (2) Attempt any four of the following.   12

(a) Discuss the structure of a Regular file. Enlist different file attributes and directories.

(b) Discuss the role of Buffer in Operating System. How does we differentiate buffering with spooling?

(c) How buffer pools are used? Discuss advantages and disadvantages of Buffer Cache.

(d) What is an Inode? How to perform conversion of a Path Name to an Inode?

(e) What is page? How we replace it?

Q (3) Attempt any two of the following   12

(a) What is system call? What system calls have to be executed by a command interpreter or shell in order to start a new process? Why there is need of process creation and termination? Enlist different system calls for above two operations?

(b) What are the advantages and disadvantages of using the same system call interface for manipulating both files and devices? Discuss the roles of system calls for file system.

(c) Discuss how the user view of designing the operating system differs with abstract view. Enlist different tasks performed by Operating System.

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Q (4)   Attempt any four of the following   12

(a)   What is process? Discuss process states and its transition.

(b)   Explain Layout of System. How do we save the context of a process?
(c)   What is System program? Discuss its categories with examples.
(d)   What is shell? Discuss its applications and types. What is system boot?

(e)   Why there is need of synchronization? What is critical section problem?

Q (5)   Attempt any four of the following   12

(a)   How do you prove the following solutions of critical section problem are
        correct? i) Mutual Exclusion is preserved.
        ii) Progress requirement is satisfied.
        Iii) Bounded waiting requirement is met.

(b)   How do we differentiate Storage manegement with Device or I/O
        management?

(c)   What is deadlock? Suggest necessary conditions for deadlock?

(d)   If short term scheduler takes 10 ms to decide to execute a process for 100
        ms, then how much percentage of CPU is being used simply for scheduling
        the work? Mention the role of scheduler with their types.

(e)   What is dynamic storage allocation problem? Give its solution?

Q (6)   Attempt any two of the following   12

(a)   How do we differentiate memory management with task or process
        management?

(b)   What is Interprocess Communication? Discuss its application.

(c)   How do you differentiate paging with segmentation by giving explanation
        on page and segment table?

(d)   Consider the following set of processes, with the length of the CPU burst
        given in ms:

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 P1,P2,P3,P4,P5, all
        at time 0.
        a) Draw Gantt charts that illustrates the execution of these processes using
           the following scheduling algorithms: FCFS, SJF, nonpreemptive priority.
        b) What is the turnaround time of each process for each of the scheduling
           algorithms?
        c) What is the waiting time of each process for each of these scheduling
           algorithms?

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