Code : 303205

BCA 2nd Semester Exam., 2023

OPERATING SYSTEM AND UNIX

Time : 3 hours

Full Marks : 60

Instructions :

(i) The marks are indicated in the right-hand margin.

(ii) There are **SEVEN** questions in this paper.

(iii) Attempt **FIVE** questions in all.

(iv) Question Nos. **1** and **2** are compulsory.

1. Answer any *six* of the following : 2×6=12

(a) How to define scheduling?

(b) What is the use of I/O buffering?

(c) What is the purpose of threads?

(d) What is the purpose of precedence graph?

(e) What is the use of memory management unit?

(f) What is the difference between frame and page table?

(**2**)

(g) What is the use of mv and wc command?

(h) What is the meaning of shell?

(i) With respect to shell, what is the purpose of job control?

(j) What is the purpose of pipes and filters?

2. Answer any *three* of the following : 4×3=12

(a) Defend timesharing differs from multiprogramming. If so, how?

(b) List two programming examples of multithreading giving improved performance over a single-threaded solution.

(c) What are the steps required to handle a page fault in demand paging?

(d) What is the use of vi editor? Write down the features of vi editor.

(e) With respect to Linux utilities, what is the purpose of permission modes and standard files?

3. What is critical section problem? Discuss the solution to producer-consumer problem using semaphores. 12

4. What is the necessary condition of deadlock? Discuss deadlock detection (Banker's algorithm) with an example. 12

5. With respect to Linux, discuss Linux process and thread management. 12

6. Consider the following reference string :

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0,
3, 2, 1, 2, 0, 1, 7, 0, 1

Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementations of the LRU algorithm. 12

7. What is process scheduler? Discuss CPU scheduling algorithms with examples. 12

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