SK 13

Exam.Code:0923
Sub. Code: 6848

1128
B. E. (Information Technology)
Fifth Semester
ITE-543/533: Operating System

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

a) What are the functions of an Operating system?
b) Why page size is always power of 2?
c) What are the main advantages of a distributed system?
d) What is Belady's anomaly?
e) Write four necessary conditions for Deadlocks? (5x2)

UNIT – I

II. Consider the following set of processes with the CPU burst time in milliseconds:

Process	Burst Time	Priority	Arrival time
PO	9	3	0
PI	4	2	1
P2	2	4	2
P3	7	5	3
P4	8	1	4

The processes are assumed to arrive in the order: P0, P1, P2, P3, P4. (10)

III. a) Give Gantt Charts illustrate the execution of these processes using FCFS, SJF (preemptive), Priority (pre-emptive) and Round Robin (quantum=3), scheduling.

b) Calculate the average turnaround time and average waiting time for each of the scheduling algorithm in part a?

IV. a) Suggest a software solution for the problem of race condition for two processes. Show that your solution achieves mutual exclusion and Progress Requirement?

b) Solve the bounded buffer producer consumer problem using semaphore? (5,5)

P.T.O.

V. Consider the following page reference string :
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 FIFO, LRU and Optimal page replacement algorithms, assuming four frames? All frames all initially empty. (10)

UNIT – II

Suppose that a disk drive has 2000 cylinders, numbered 0 to 1999. 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, 470, 913,1274, 348,1419, 1022, 750,130. Starting from the current head position, what is the total distance that disk arm moves to satisfy all pending requests, for each of the following disk scheduling algorithms? (Show in graph also)

a) FCFS
b) SSTF
c) SCAN
d) LOOK
e) C-SCAN (10)

VI. a) Explain different types of disk allocation methods?
b) Differentiate between Stateful and Stateless service? (5,5)

VII. a) Explain the process of deadlock detection for distributed systems?
b) Discuss the layout of UNIX file system? What is the structure of i-node? How does the path name get translated to i-node number? (5,5)

x-x-x