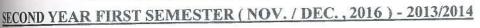


## EASTERN UNIVERSITY, SRI LANKA DEPARTMENT OF MATHEMATICS



## CS 202 - OPERATING SYSTEMS

## REPEAT

rall questions

Time allowed: 2 Hours

SRILAT

operating system is a program that manages a computer's hardware.

Describe the differences between symmetric and asymmetric multiprocessing. How do dustered systems differ from multiprocessor systems?

helly explain three system components with their major activities.

What is the purpose of system calls? Explain the types of system calls.

What are the differences between threads and process?

Describe the differences among Many-to-One, One-to-One and Many-to-Many multi treading models.

hocesses can execute concurrently or in parallel. Concurrent access to shared data may stult in data inconsistency.

What do you understand by semaphore? Briefly explain the type of semaphores.

Explain the **Producer Consumer Problem** of process synchronization and how smaphores could be used to solve the problem.

Compare the scheduling algorithms Round Robin scheduling and priority scheduling.

Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time	Arrival Time	Priority
P1	25	0_	40
P2	20	20	30
P3	25	30	30
P4	15	60	35
P5	5	70	5
P6	10	75	10

- I. Draw the Gantt charts that illustrate the execution of these processes in following scheduling algorithms:
  - a. Round Robin (using a time quantum of 10 milliseconds);
  - b. Preemptive Priority Scheduling.
- II. What is the turnaround time and waiting time of each process for each scheduling algorithms in part I? Calculate the average turnaround time and so turnaround time for each of those algorithms.
- III. Identify the scheduling algorithm from part (I) that result in the minimal waiting time.
- Q3. Deadlocks are a set of blocked processes each holding a resource and waiting to resource held by another process.
  - 1. How do you confirm that a system is in deadlock state?
  - 2. How can you recover a system from deadlock state?
  - Consider the following snapshot of a system:
     The system has five processes namely, P0, P1, P2, P3, & P4 and the resourn namely A, B, C, & D.

Process	Allocation ABCD	Max ABCD	Available A B C D
P1	3121	5252	
P2	2103	2316	
P3	1312	1 4 2 4	
P4	1 4 3 2	3 6 6 5	

Answer the following questions using the Banker's algorithm:

- a) What is the content of Need Matrix?
- b) Illustrate that the system is in a safe state by demonstrating an order in processes may complete.
- c) If a request from process P1 arrives for (1, 1, 0, 0), can the request immediately? If yes give the safe sequence.
- d) If a request from process P4 arrives for (0, 0, 2, 0), can the request immediately? If yes give the safe sequence.

Memory management keeps track of each and every memory location either it is allocated to some process or it is free.

Discuss the Static and Dynamic memory partitioning schemes.

Briefly explain the paged memory management scheme with the aid of a diagram.

- I. What do you understand by memory fragmentation?
- II. Explain the difference between internal and external fragmentation.

The following table shows the job details and the list of memory blocks of the system:

Job List			
Job No	Memory Requested		
J1			
J2	10		
J3	35		
J4	15		
J5	23		
J6	25		

Memory List			
Memory Block	Block Size		
Block 1	50		
Block 2	100		
Block 3	70		
Block 4	115		
Block 5	15		

- I. Jobs are loaded into memory using fixed partition. Use the first-fit, best-fit and worst-fit memory allocation policies to allocate the memory blocks to the jobs given and calculate the memory fragmentation in each case.
- II. Which is the most efficient allocation policy for the particular problem given above? Justify your answer.