Total No. of Questions-8] [Total No. of Printed Pages-4

B.E. VI Semester Examination

BE-VI/6(A)

213664

COMPUTER ENGINEERING

Course No. COM - 605

(Operating System)

Time Allowed-3 Hours *Maximum Marks-100*

Note : i) There are **two** sections, each containing **four** questions of **20** Marks each.

ii) Five questions are to be attempted, selecting atleast two from each section

Section - A

1. A) Discuss various operations perform by an Operating System. Also compare Multi programming system with Time Sharing Systems **(10)**

B) Explain different computer system architectures in brief and compare them by listing their advantages and disadvantages. **(10)**

2. A) What is a Process Control Block? Explain its function in detail. How CPU switches from one process to another? **(10)**

B) Explain the process scheduling mechanism by drawing various queues and also explain the roles of various schedules in this scheduling mechanism. **(10)**

3. A) Consider the following set of processes, with the arrival times and the CPU burst times given in milliseconds.

Process	Arrival Time	Burst Time
P1	0	5
P2	1	3
P3	2	3
P4	4	1

What is the average turnaround time for these processes with the preemptive shortest remaining processing time first algorithm and Round Robin (with time quantum = 2)? **(12)**

B) Explain the concept of Multilevel Queue Scheduling. **(8)**

4. A) Explain Dining-Philosophers problem of synchronization and give the solution for it **(10)**

B) Discuss the trade off between fairness and throughput of operations in the readers-writers problem. Propose a method for solving the readers-writers problem without causing starvation. **(10)**

Section - B

5. A) Explain various deadlock prevention techniques. **(8)**

B) Consider the following snapshot of a system **(12)**

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	2				

Answer the following questions using the banker's algorithm:

i) What is the content of the matrix Need?

ii) Is the system in a safe state?

iii) If a request from process P1 arrives for (0,4,2,0), can the request be granted immediately?

6. A) Define virtual memory? Describe various methods for implementing virtual memory management? Discuss their advantages and disadvantages. **(10)**

B) Given five memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB(in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB 112 KB, and 426 KB(in order)? Which algorithm makes the most efficient use of memory? **(10)**

7. A)

Consider the virtual page reference string 1,2,3,2,4,1,3,2,4,1. On a demand paged virtual memory system running on a computer system that main memory size of 3 pages frames which are initially empty. Find the number of page faults for LRU, FIFO and OPTIMAL page replacements policy. **(10)**

B) Differentiate between **(5×2)**

i) Internal and External fragmentation

ii) Global and local frame allocation algorithms

8. A) Explain in detail the process management of UNIX Operating System **(10)**

B) Explain following UNIX Commands - **(2×5=10)**

i) printmv

ii) more

iii) grep

iv) head

v) rmdir