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Sixth Semester B.E. Degree Examination, June/July 2019
Operating Systems

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the role of operating system from different viewpoints. Explain the dual mode of operation of an operating system. **(07 Marks)**

b. Demonstrate the concept of virtual machine with an example. **(05 Marks)**

c. Explain the types of multiprocessing system and the types of clustering. **(04 Marks)**

OR

2 a. Describe the implementation of interprocess communication using shared memory and message passing. **(06 Marks)**

b. Demonstrate the operations of process creation and process termination in UNIX. **(06 Marks)**

c. Explain the different states of a process, with a neat diagram. **(04 Marks)**

Module-2

3 a. Discuss the threading issues that come with multithreaded program. **(08 Marks)**

b. Illustrate how Reader's-Writer's problem can be solved by using semaphores. **(08 Marks)**

OR

4 a. Calculate the average waiting time by drawing Gantt chart using FCFS (First Come First Serve), SRTF (Shortest Remaining Time First), RR (Round Robin) [q = 2 ms] algorithms.

Process	Arrival time	Burst time
P_1	0	9
P_2	1	4
P_3	2	9
P_4	3	5

(08 Marks)

b. Explain the Dining-Philosopher's problem using monitors. **(08 Marks)**

Module-3

5 a. Determine whether the following system is in safe state by using Banker's algorithm.

Process	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	0	4	3	3			

If a request for P_1 arrives for (1 0 2), can the request be granted immediately? **(09 Marks)**

b. Discuss the various approaches used for deadlock recovery. **(07 Marks)**

OR

6   a.   Illustrate with example, the internal and external fragmentation problem encountered in continuous memory allocation.   **(07 Marks)**
    b.   Explain the structure of page table.   **(09 Marks)**

Module-4

7   a.   Illustrate how demand paging affects systems performance.   **(08 Marks)**
    b.   Describe the steps in handling a page fault.   **(08 Marks)**

OR

8   a.   Explain the various types of directory structures.   **(08 Marks)**
    b.   Describe various file allocation methods.   **(08 Marks)**

Module-5

9   a.   Explain the access matrix model of implementing protection in operating system.   **(07 Marks)**
    b.   Explain the following disk scheduling algorithm in brief with examples:
        i) FCFS scheduling
        ii) SSTF scheduling
        iii) SCAN scheduling
        iv) LOOK scheduling   **(09 Marks)**

OR

10 a.   Explain the components of LINUX system with a neat diagram.   **(08 Marks)**
    b.   Explain the way process is managed in LINUX platform.   **(08 Marks)**

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