VR20 Reg. No: 208W1A1299

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SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, March, 2022

Third Semester

INFORMATION TECHNOLOGY

20IT3305 OPERATING SYSTEMS

Time: 3 hours ***Max. Marks: 70***

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. List different states of a process.

   b. Specify the difference between preemptive and non-preemptive scheduling.

   c. List the necessary conditions for a deadlock to occur.

   d. What is meant by busy waiting in semaphores?

   e. List the file access methods in file system.

   f. What is the process of synchronization?

   g. Differentiate between boot control block and volume control block.

   h. Write the causes of thrashing.

   i. List the file allocation methods.

   j. What is meant by safe mode in deadlock?

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PART-B

4 x 15 = 60M

UNIT-I

2. a. What is a System call? Explain in detail about the system call sequence to copy the contents of one file to another file. **8M**

   b. What are the advantages of inter-process communication? How communication takes place in a shared-memory environment? Explain. **7M**

(or)

3. a. What is Thread? Explain multithreading operating system models with advantages and disadvantages. **8M**

   b. Describe the differences among long-term, short-term and medium-term schedulers. **7M**

UNIT-II

4. a. Assume the following workload in a system: **8M**

Process	Arrival Time	Burst Time
P1	5	5
P2	4	6
P3	3	7
P4	1	9
P5	2	2
P6	6	3

Draw a Gantt chart illustrating the execution of these jobs using Round Robin scheduling algorithm and also calculate the average waiting time and average turnaround time.

4. b. Write Peterson's algorithm for 2-process synchronization to critical section problem and discuss briefly. **7M**

(or)

5. a. What is semaphore? Explain its implementation as wait () and signal () for providing process synchronization. **9M**

b. Write a Short notes of the following **6M**

- CPU scheduler
- CPU I/O burst cycle
- Dispatcher

UNIT-III

6. a. Consider the reference string: **10M**
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 for a memory with three frames. Trace FIFO, optimal, and LRU page replacement algorithms.

b. Write short notes on **5M**

i) Resource allocation graph.

ii) Issues that arise by resource pre-emption in deadlock recovery.

(or)

7. a. Consider the following snapshot at time T_0: **10M**

	Allocation	Max	Available
	A B C	A B C	A B C
P0	0 1 0	7 5 3	3 3 2
P1	2 0 0	3 2 2	
P2	3 0 2	9 0 2	
P3	2 1 1	2 2 2	
P4	0 0 2	4 3 3	

Using deadlock detection algorithm, verify whether there is a safe sequence? If exists, specify the safe sequence.

7. b. Discuss demand paging with a neat diagram. **5M**

UNIT-IV

8. a. Discuss the different file allocation methods with suitable example. **8M**

   b. Write short note on file attributes, file operations and its types. **7M**

(or)

9. a. Suppose the head of a moving head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143.If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175, 130. Find the total head movement to satisfy these requests using SSTF disk scheduling algorithm? Represent in a neat diagram. **9M**

   b. Explain briefly about RAID levels and its selection. **6M**

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