B.Tech. (Computer Science & Engineering) Third Semester (C.B.C.S.)

Operating System

P. Pages : 2

Time : Three Hours

PSM/KW/23/2571

Max. Marks : 70

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Due credit will be given to neatness and adequate dimensions.
8. Assume suitable data whenever necessary.

1. a) Elaborate how would you define the term "Operating System"? Draw and discuss the various components of a Computer System. **8**

b) Explain following types of operating system. **6**
i) Multiprogramming OS ii) Multitasking OS
iii) Real time OS iv) Distributed System.

OR

2. a) Draw and outline the operating system services in brief. **7**

b) Explain different types of system call in detail. **7**

3. a) Suppose a disk drive has 300 cylinders numbered 0 to 299. The drive is currently serving a request at cylinder 127. The queue of pending request in FIFO order is 76, 94, 99, 130, 187, 213, 289, and 295. Starting from the current head position, what is the total distance that the disk arm moves to satisfy the entire pending request for each of the following disk-scheduling algorithm? 1) FCFS 2) SSTF 3) SCAN 4) C-SCAN 5) LOOK 6) C-LOOK. **9**

b) Explain contiguous file allocation, linked allocation and index allocation strategies. **5**

OR

4. a) Consider following set of processes. Calculate the average waiting time and turnaround time for FCFS, SJF, Round Robin (TQ = 4) & Priority scheduling algorithm. **8**

Process ID	Arrival Time	Burst Time	Priority
1	0	15	2
2	2	3	1
3	5	5	5
4	6	8	4
5	7	12	3

b) What is Process Control Board? Describe in brief with neat sketch. **6**

5. a) How many page faults occur for FIFO and LRU algorithms for the following reference string, for four page frames? 1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4. **7**

b) Differentiate between Internal & External Fragmentation? 7

OR

6. a) Draw the state transition diagram of process and describe each state in detail. 8

b) What is Scheduler? Explain different types of schedulers? 6

7. a) What is paging? How paging and segmentation differ from each other. 7

b) With neat diagram explain the concept of demand paging. 7

OR

8. a) What is Dead lock? Explain 4 conditions of deadlock. 7

b) What is address binding? Explain various types of binding. 7

9. a) Illustrate dining-philosophers problem in your words. 8

b) Discuss the directory structure of file system. 6

OR

10. a) Discuss the strengths and weaknesses of implementing an access matrix using capabilities that are associated with domains. 6

b) Consider following snapshot of a system Available
A B C D
1 5 2 0

Process	Allocation				MAX			
	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2
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	6

i) What is the content of matrix need? 2

ii) Is the system in safe state? Prove it. 3

iii) If a request from process P1 arrives for (0, 4, 2, 0) can the request be immediately granted? Why? 3

****