B.E. Fifth Semester (Computer Technology) (C.B.S.)

Operating Systems

P. Pages : 3 **NKT/KS/17/7346**

Time : Three Hours * 0 0 5 8 * Max. Marks : 80

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. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What is the purpose of system calls? Enumerate five system calls used in process management or file management. **7**

b) Distinguish between mulitasking, multiprogramming and multiprocessing. **6**

OR

2. a) Write short note on **any three.** **6**

i) Real Time

ii) Time Sharing

iii) Batch processing

iv) Distributed with advantage

b) List five services provided by an operating system. Explain how each of them provides convenience to the users. Explain in which cases it would be impossible for user level programs to provide these services. **7**

3. a) Define critical section problem and its solution by using semaphore. Use this approach to solve producer/consumer problem. **8**

b) Differentiate between Semaphores and monitors. **5**

OR

4. a) Discuss synchronization problem with an example. **6**

b) What are P and V operations in process synchronization? Explain. **7**

5. a) Write in brief various deadlock prevention techniques. **4**

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b) Solve the following using Banker's algorithm and find out whether resultant system state is safe or not. **10**

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

i) What is the content of the matrix need?

ii) Is the system in a safe state?

iii) If a request from process P_1 arrives for (0,4,2,0) can the request be granted immediately?

OR

6. a) Write short note on **any three.** **14**

i) Access Matrix **5**

ii) Cryptography **5**

iii) Security threat **4**

iv) Recovery from deadlock **4**

7. a) Explain following types of file allocation with advantages and disadvantages. **9**

i) Contigeous

ii) Linked

iii) Indexed

b) Describe in detail segmentation and demand paging. **4**

OR

8. a) Describe in detail virtual memory management. **4**

b) Consider the following page reference string. **9**
2, 3, 4, 2, 1, 3, 7, 5, 4, 3 for a memory with 3 frames. How many page paults would occur for following page replacement algorithm.

i) LRU ii) FIFO

iii) Optimal

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9. a) What do you mean by file system? Explain its components. **5**

b) Suppose that disk drive has 5,000 cylinders, membered 0 to 4999. Current head location 143, and previous request was at cylinder 125. The queue of pending request in FIFO order is. **8**

86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 starting from current head, what is total distance for each of the following disk scheduling algorithm?

i) FCFS
ii) SSTF
iii) C - LOOK
iv) C - SCAN

OR

10. a) What is device directory? What are the various data structures for device directory? **7**

b) Discuss file recovery in detail. **6**

11. a) Describe the process of transforming I/O to hardware operations in detail. **8**

b) Differentiate between user thread and Kernel thread. What is thread cancellation? Explain its types. **6**

OR

12. Write short note on - **14**

i) Swap - space management. **4**

ii) Application I/O interface. **5**

iii) Disk Scheduling. **5**

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