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B.E.(Computer Science Engineering) Fourth Semester (C.B.S.)

Operating System

P. Pages : 2 **NRT/KS/19/3380**

Time : Three Hours * 0 6 4 1 * 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. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) Distinguish between multi-tasking, multi-programming and multi-processor system. **6**

b) What is system call? Discuss various types of system calls. **7**

OR

2. a) Discuss the various services provided by operating system. Justify your answer by giving real life example. **7**

b) Write short notes on: - **6**
i) Distributed system ii) Real time system
iii) Batch system

3. a) Explain contiguous and Index allocation methods. **5**

b) Suppose that a disk drive has 5000 cylinders membered from 0 to 4999. The drive is currently serving a request at cylinder 143 and previous request was at cylinder 125. The queue of pending request in FIFO is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 starting from the current head position, what is the total distance that the disk arm moves to satisfy all the pending request for each of the following disk scheduling algorithms. **9**
i) FCFS ii) SSTF
iii) SCAN iv) C-SCAN
v) LOOK vi) C-LOOK

OR

4. a) Discuss the various file Access methods. **4**

b) What is the need of file system? Explain various operations associated with files. **7**

c) Define file system. What are the various components of file system? **3**

5. a) Define Thread. Explain the various Multithreaded Models. **5**

b) Draw the state transition diagram of process and Explain each state in detail. **4**

c) What is Scheduler? Explain different types of Schedulers. **4**

OR

6. a) Explain the concept of process control Block, with neat diagram. **6**

b) Consider the following set of processes. Calculate the average Waiting time and turn around time for following algorithms. **7**

i) FCFS ii) SJF

iii) RR (time slice-2)

Process	CPU Burst Time	Arrival Time
P_1	3	0
P_2	5	1
P_3	2	2
P_4	5	3
P_5	5	4

7. a) What is fragmentation? Explain Internal fragmentation and External fragmentation. **7**

b) Explain the hardware implementation of paging in detail with neat sketch. **7**

OR

8. a) Write short notes on: **7**

i) Thrashing ii) Garbage collection

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

i) LRU ii) FIFO

iii) Optimal replacement

9. a) What is mutual exclusion? How the semaphore is used to solve the critical section problem. **7**

b) Explain any two classical problems of synchronization. **6**

OR

10. a) What is the critical section problem. Explain the three conditions that a solution to a critical section problem must satisfy. **6**

b) Define monitor. Give the solution to dining philosopher problem using monitor. **7**

11. a) Explain Banker's algorithm in detail. **7**

b) What is the difference between ACCESS list & CAPABILITY List? **6**

OR

12 a) Explain the following.

i) Deadlock system model. **4**

ii) Resource allocation graph. **4**

iii) Deadlock prevention. **5**

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All our dreams can come true if we have the courage to pursue them.

~ Walt Disney