

TE | IT | V (REV)

OFCP  
OFCP

KR-5012

[Total Marks : 100]

AGJ-2nd half (0-12-43)

Con. 9208-12.

(3 Hours)

N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any four questions out of the remaining six questions.

1. (a) What is the critical section problem ? Discuss Dekker's solution and show how it satisfies all three requirements of the critical section problem. 10
- (b) Compare and contrast short term, long term and medium term scheduling. 10

2. (a) Consider the following set of processes with length of CPU bursts given in milliseconds. 12

Process	Burst-Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The arrival order is P1 P2 P3 P4 P5 all at time 0.

- (i) Draw Gantt Charts illustrating execution of these processes using FCFS, SJF (non-preemptive) and RR (quantum=1) algorithms.
- (ii) Calculate the turnaround time and waiting time for each process and state which algorithm results in minimum waiting time.
- (b) What is mutual exclusion ? Discuss different ways in which it can be achieved. 8
3. (a) Assume that the disk head is initially positioned over track 100. For the disk space request of 27, 129, 110, 186, 147, 41, 10, 64 and 120 show how disk scheduling is done for (i) SSTF (ii) C-SCAN (iii) C-LOOK. Calculate the average seek length and show the tracing of the requests. 10
- (b) Discuss the different file allocation methods. 10

4. (a) What are the different methods of free space management to keep track of free disk space ? 10
- (b) Discuss the different approaches of I/O buffering provided by the O.S. 10

5. (a) Consider the following sequence of page reference – 10  
1,0,2,2,1,7,6,7,0,1,2,0,3,0,4,5,1,5,2. How many page fault would occur for LRU, FIFO and optimal algorithms assuming a page frame of 4 ?
- (b) Explain the necessary and sufficient conditions for a deadlock. Explain how a resource allocation graph determines a deadlock. 10

6. (a) What are the characteristics of real-time systems? 10
- (b) Compare and contrast deadline scheduling and rate monotonic scheduling algorithms. 10

7. Write short notes on (any two) :- 20
- (a) System Calls (c) User Threads and Kernel Threads
- (b) Semaphores (d) Applications of RTOS.