YMCA UNIVERSITY OF SCIENCE & TECHNOLOGY, FARIDABAD

M. TECH. CN 1TH SEMESTER (UNDER CBS)

RESOURCE MANAGEMENT IN COMPUTER SYSTEMS (MTCE-17-102)

Time: 3 Hours Max. Marks: 90

Note: 1. *It is compulsory to answer the questions of Part -1. Limit your answers within 20-40 word in this part.*
2. *Answer any four questions from Part -2 in detail.*
3. *Different parts of the same question are to be attempted adjacent to each other.*
4. *Assume suitable standard data wherever required, if not given.*

PART -1

Q1 (a) Differentiate Process and Program. (1.5)

(b) What is Spooling? (1.5)

(c) What are the 3 conditions which must be satisfied by solution of Critical-section problem? (1.5)

(d) Define race condition with an example. (1.5)

(e) What is Belady's anomaly? Which of the page replacement algorithm suffers from this anomaly? (1.5)

(f) Describe a way to remove external fragmentation. (1.5)

(g) What is counting Semaphore? Explain with an example. (1.5)

(h) Differentiate spinlock, livelock and deadlock. (1.5)

(i) What is a system call? (1.5)

(j) Describe Elevator disk scheduling algorithm. (1.5)

PART -2

Q2 (a) Describe the key features of different OS architectures and give examples of operating system based on the architecture. (10)

(b) Differentiate Network, Distributed and Real-time operating system. (5)

Q3 (a) How shortcomings of Round-robin scheduling can be handled using improved round robin and HRRN. Schedule the following scenario using improved round robin and HRRN with time quantum=1. (10)

Process	Arrival time	Execution time
P1	0	3
P2	2	3
P3	3	2
P4	5	4

(b) Describe a solution to deal with critical section problem if there are multiple processes. (5)

Q4 (a) Compare the performance of FIFO, Modified FIFO (Second chance), LRU and optimal page replacement for the following demand sequence if number of frames. (10)

Demand Sequence	5	0	2	1	0	3	0	2	4	3	0	3	2	1	3	0	1	5

(b) Differentiate external and internal fragmentation. (5)

Q5 (a) Describe different file access and allocation methods in detail. (10)

(b) Explain life-cycle for handling I/O interrupt request. (5)

Q6 (a) Compare the total head movement for the following scenario using C-Scan and C-Look disk scheduling algorithm. If the head starts at 53 and direction is right. (8)

Queue	98	183	37	122	14	124	65	67

(b) Discuss types and nature of resources. (5)

(c) Does cycle in RAG is mandatory and sufficient condition to detect a deadlock? (2)

Q7 (a) Consider the following snapshot of a system and find whether the system is in safe state or not? (5)

Process	Allocation				Maximum				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
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				

(b) How necessary conditions for prevention of deadlock can be breached? (10)

****