Sem II OS 13/5/15

Q.P. Code : 19485

(3 Hours) [Total Marks: 80

N.B.: (1) Question No. **1** is **compulsory.**
(2) Attempt any **four** questions from the remaining **six** questions.
(3) Answers to **sub-questions** should be answered **together.**
(4) Draw the **diagrams** wherever **required.**

Q1. (a) For the processes listed in the table, draw Gantt chart and calculate average waiting time and average turnaround time using:- 12
(i) FCFS
(ii) Shortest Job First (both preemptive & non preemptive)
(iii) Round Robin (quantum = 4)

Process	Arrival Time (ms)	Processing Time (ms)
P1	0	8
P2	1	4
P3	2	9
P4	3	5

(b) What is deadlock? What are the necessary conditions for a deadlock to occur? Explain various method of preventing deadlock. 8

Q2. (a) What are external and internal fragmentations? Discuss the techniques to overcome fragmentations. 8
(b) What is process? Explain five state process model with each state transition in it. 7

Q3. (a) Consider following snapshot of a system 8

Process	Allocation			Max			Available		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
P0	0	2	1	6	4	2	4	2	4
P1	0	0	1	2	2	1			
P2	2	1	0	3	2	1			
P3	2	0	0	6	0	3			
P4	3	1	1	4	2	2			
P5	1	1	1	2	2	2			

Using Banker's Algorithm answers the following:-
(i) What is the context of matrix need?
(ii) Is the system in safe state? Give the sequence.
(iii) If a request from process P0 arrives for (0, 1, 0) can the request be granted immediately?

(b) Explain the different method of file access. 7

[TURN OVER

Q4. (a) Given reference string to the following pages by a program :- 8
1,2,3,4,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6.
How many page faults will occur for the following page replacement algorithms, assuming three frames?
1. LRU replacement
2. FIFO replacement
3. Optimal replacement

(b) Explain the concept of spooling and explain how it is different from buffering? 7

Q5. (a) What is semaphore? Explain different types of semaphore. Also explain the difference between semaphore and monitor. 8

(b) When does the page fault occur? Describe the action taken by O.S. when page fault occurs. 7

Q6. (a) Suppose a disk drive has 200 cylinders, numbered 0 to 199. The driver is currently serving a request at cylinder 100 and previous request was at cylinder 130. The queue of pending request in FIFO order is 120, 90, 55, 135, 60, 75, 150. 8
What is the total head movement under the following scheduling algorithms?
(i) FCFS (ii) SSTF (iii) SCAN (iv) C-SCAN.

(b) Explain the Access Matrix model of protection. How does it serve a useful abstraction for reasoning about protection mechanism in computer systems? 7

Q7. Write a short notes on any three :- 15
(a) Free Space Management
(b) Linker and Loader
(c) Multithreading
(d) Race Condition
(e) Android OS