

(3 Hours)

Total Marks: 80

- N.B.** 1) Question **no.1** is compulsory
 2) Solve any **Three** questions from remaining five.
 3) Assume suitable data and draw diagram wherever required.

Q1.	Attempt any four	Marks
a.	What are the various objectives and functions of Operating Systems?	5
b.	Differentiate between process and threads.	5
c.	Explain about Resource Allocation Graph (RAG).	5
d.	Explain about file attributes, file operations, and file types.	5
e.	What is virtual memory? Mention its advantages.	5
Q2.	a. Explain file allocation methods in detail with proper diagram.	10
	b. Consider the following set of processes indicated as (process name, Arrival time, burst time) for the following (P1,0,6), (P2,1,4), (P3,3,5), (P4, 5, 3). Draw the Gantt charts illustrating the execution of these processes using preemptive and non-preemptive SJF and FCFS. Calculate average turnaround time, average waiting time in each case.	10
Q3.	a. Give the explanation of necessary conditions for deadlock. Explain how a resource allocation graph determines a deadlock.	10
	b. What is Internal fragmentation? Explain static partitioned allocation with partition sizes 400,180, 100,300,45. Assuming First fit and Best fit method indicate the memory status after memory request for sizes 95, 180, 285, 380, 30.	10
Q4.	a. What is a thread? How multithreading is beneficial? Compare and contrast different multithreading models.	10
	b. Explain paging in detail. Describe how logical address is converted into physical address.	10
Q5.	a. What is semaphore and its types? How the classic synchronization problem -Dining philosopher is solved using semaphores?	10
	b. Explain RAID Level in Details	10
Q6.	a. Consider the page reference string 1,2,3,5,2,4,5,6,2,1,2,3,7,6,3,2,1,2,3,6. Calculate the Page fault using 1. Optimal 2.LRU 3. FIFO algorithms for a memory with three frames.	10
	b. What is open-source operating system? What are the design issues of Mobile operating system and Real time operating system?	10