

Roll No. ....

Total Pages : 3

**GSM/M-20**

**1636**

**COMPUTER SCIENCE**

(Operating System)

Paper-II

Time Allowed : 3 Hours]

[Maximum Marks : 40

**Note** : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

**Compulsory Question**

1. (a) Write the responsibility of an operating system as a resource manager.
- (b) Differentiate between preemptive and non-preemptive scheduling.
- (c) What are the functions of mutex semaphore?
- (d) Briefly explain file protection and security.

4×2=8

**UNIT-I**

2. What are the characteristics of an operating system? Discuss the different operating system architecture approaches. 8

**1636/K/147**

**P. T. O.**

3. (a) Explain how multiprogramming contributes to higher CPU utilization and increased throughput. Is it possible to support timesharing without multiprogramming?
- (b) What is an operating system structure? Explain the categorization of system call. 4+4=8

### UNIT-II

4. (a) How to recover from deadlock situations? Discuss in detail.
- (b) What is a process? Explain about various fields of process control block. 4+4=8

Consider a system with a set of processes P1, P2, P3 and P4. Let their arrival times and CPU burst times mentioned as below :

<b>Process</b>	P1	P2	P3	P4
<b>Arrival Time</b>	0	1	5	6
<b>CPU Burst Time</b>	3	6	4	2

5. Draw the Gantt chart using :
- (a) FCFS    (b) SJF    (c) RR [Assume quantum to be 2 units of time]

- Calculate : (a) Average Turnaround Time  
(b) Average wait time  
(c) Average throughput 8

### **UNIT-III**

6. What is a critical section problem? Give the conditions that a solution to the critical section problem must satisfy. 8
7. (a) Differentiate between paging and segmentation.  
(b) When does a page fault occur? Explain LRU (Least Recently Used) Page replacement algorithm. 8

### **UNIT-IV**

8. What is meant by disk scheduling? Explain why disk scheduling is necessary. Briefly explain SSTF disk scheduling algorithm. 8
9. Compare sequential and random file access methods with respect to their usefulness in today's applications. 8