

GOVT. COLLEGE FOR WOMEN, PARADE, JAMMU
B.C.A (Computer Application)-3rd- Semester (Regular)

Course Id: UBCATC-301
Course Title: Fundamentals of Operating Systems

Duration: 3hrs
Maximum Marks: 80

Section-A: This section contains 5 questions of 3 marks each. All questions are compulsory.

- Q1. What do you mean by waiting time and response time?
- Q2. What do you mean by race condition?
- Q3. What is virtual memory?
- Q4. What do you mean by files? What are the operations that could be performed on a file?
- Q5. What is DOS? How it is different from windows?

Section-B: This section contains 5 (one from each Unit) questions of 7 marks each. All questions are compulsory.

- Q6. What is a Process? Discuss the concept of process states in detail.
- Q7. What is meant by a critical section problem? How it is managed? Explain the role of semaphores for a critical section.
- Q8. Compare Paging and Segmentation.
- Q9. Explain various file allocation methods in detail.
- Q10. What are files and directories in DOS? What is a wild card character?

Section C: This section contains five long answer questions (one from each Unit) of 15 marks each. Attempt any two.

Q11. Consider the following set of processes with the length of CPU burst time give in milliseconds:

<u>Process</u>	<u>Burst Time</u>	<u>Priority</u>
P1	10	3
P2	29	1
P3	3	3
P4	7	4
P5	12	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.

- (a) What is the turnaround time of each process for using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum=10) scheduling.

(b) What is the waiting time of each process for each of the scheduling algorithms in part a.

Q12. What is a Deadlock? What are the four necessary conditions to occur a deadlock? Explain the banker's algorithm.

Q13. Consider the following page reference string:

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 7, 0, 1.

How many page faults would occur for the following replacement algorithms assuming three frames? Remember that all frames are initially empty.

(a) LRU replacement

(b) FIFO replacement

(c) Optimal replacement

Q14. What is disk scheduling? What do you mean by seek time and rotational latency? Suppose the order of request is- (82, 170, 43, 140, 24, 16, 190). The current position of the read/write head is 50. Calculate the total head movements using FCFS and SSTF disk scheduling algorithms. Assume disk drive has 200 cylinders i.e. 0 to 199.

Q15. Differentiate between DOS Internal and External Commands. Explain any 6 Internal and 6 External commands with syntax and examples.