

2023
B.A./B.Sc.
Third Semester
 CORE – 6
COMPUTER SCIENCE
Course Code: CSC 3.21
 (Operating Systems)

Total Mark: 70
Time: 3 hours

Pass Mark: 28

Answer five questions, taking one from each unit.

UNIT-I

1. (a) Define operating system (OS). What are the services provided by OS? 1+5=6
- (b) Explain batch and time-sharing operating systems with illustrations. Write the pros and cons for each operating system. 4+4=8
2. (a) What are real-time operating systems? Write down its advantages and disadvantages. List and explain the types of real-time systems. 2+4+3=9
- (b) Briefly explain process control systems. 2
- (c) Explain the following terms given below: 3×1=3
 - (i) Multiprocessing
 - (ii) Multitasking
 - (iii) Multithreading

UNIT-II

3. (a) What is a kernel? What are the functions of a kernel? 1+4=5
- (b) Differentiate between operating system and kernel. 5
- (c) Explain the read() and write() system call. 4
4. (a) List and explain all the types of kernel along with their pros and cons. 10

- (b) What are system programs? What are the types of system programs? 1+3=4

UNIT-III

5. (a) What are the differences between a process and a thread? 3
 (b) Explain user level and kernel level threads along with their pros and cons. 6
 (b) Explain the life cycle of a process. 5
6. (a) What are process schedulers? Explain the types of process schedulers. 1+6=7
 (b) Calculate the average waiting time and average turn-around time, using round-robin scheduling algorithm with time quantum 4, for the following processes: 7

Processes	Arrival Time	Burst Time
P1	0	8
P2	1	6
P3	3	3
P4	5	2
P5	6	4

UNIT-IV

7. (a) Explain fragmentation. How can it be reduced? 3+2=5
 (b) Write a note on compaction and swapping. 5
 (c) What are the types of partitioning in OS? 4
8. (a) What is MMU? With the help of a diagram, explain how the mapping between logical and physical addresses is done. 1+3=4
 (b) Explain segmentation with an example. Why is it required? 5+2=7
 (c) Write a short note on virtual memory. 3

UNIT-V

9. (a) What are dedicated and shared devices? 2
 (b) Explain all the logical structures of a directory along with their pros and cons. 12

10. (a) Explain the linked list allocation method with an illustration. Write down its advantages and disadvantages. 4+4=8
- (b) What do you understand by device management in OS? 2
- (c) Explain the following file operations: 4×1=4
- (i) Create operation
 - (ii) Open operation
 - (iii) Seek operation
 - (iv) Truncate operation
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