

# CBCS SCHEME

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18CS654

Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024

## Introduction to Operating System

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain Storage device hierarchy with a neat diagram. (06 Marks)
- b. Discuss the working of modern computer system with a neat diagram. (06 Marks)
- c. Discuss (i) Traditional Computing (ii) Client – Server computing. (06 Marks)
- d. Define (i) Operating System (ii) Control program. (02 Marks)

OR

- 2 a. Discuss different functions provided by the operating system services. (06 Marks)
- b. Discuss about system programs in detail. (06 Marks)
- c. Discuss about the Java Virtual Machine with a neat diagram. (04 Marks)
- d. Discuss MS-DOS layered structure of an operating system with a neat diagram. (04 Marks)

### Module-2

- 3 a. Discuss process control block with a neat diagram. (06 Marks)
- b. Explain Interprocess Communication model with respect to (i) Message passing (ii) Shared memory. (06 Marks)
- c. Discuss communication in Client-Server systems using sockets. (04 Marks)
- d. Discuss any four reasons for providing an environment that allow process co-operation. (04 Marks)

OR

- 4 a. Explain the benefits of a multithreaded programming. (04 Marks)
- b. Discuss different multithreaded models. (06 Marks)
- c. Explain (i) P-threads (ii) Win-32 threads (iii) Java threads. (06 Marks)
- d. Discuss any two threading issues with multithreaded programs. (04 Marks)

### Module-3

- 5 a. Using priority scheduling, calculate the average waiting time for the process given below:

Process	Burst-Time	Priority
P <sub>1</sub>	10	3
P <sub>2</sub>	1	1
P <sub>3</sub>	2	4
P <sub>4</sub>	1	5
P <sub>5</sub>	5	2

- b. Explain Symmetric Multithreading architecture with a neat diagram. (04 Marks)
- c. Discuss (i) Multilevel Queue Scheduling (ii) Multilevel feedback queue scheduling with a neat diagram. (06 Marks)
- d. (i) Define Dispatch latency (ii) Discuss different criterias involved in scheduling an algorithm. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Explain about Semaphores. (04 Marks)  
b. Discuss (i) Readers - Writers problem (ii) Bounded - Buffer problem. (06 Marks)  
c. Differentiate between preemptive kernels and non-preemptive kernels. (06 Marks)  
d. Discuss about different types of Storage media. (04 Marks)

**Module-4**

- 7 a. Discuss different methods of handling deadlocks. (06 Marks)  
b. Define Deadlock. Discuss any three issues need to be addressed if preemption is required. (04 Marks)  
c. Discuss (i) Resource allocation graph algorithm. (ii) Bankers algorithm. (06 Marks)  
d. Discuss different methods of process termination. (04 Marks)

OR

- 8 a. Discuss Segmentation Hardware with an example and a neat diagram. (06 Marks)  
b. Discuss the structure of the page table. (06 Marks)  
c. Discuss (i) Memory allocation (ii) Fragmentation. (06 Marks)  
d. Define (i) Logical address (ii) Memory - Address Register. (02 Marks)

**Module-5**

- 9 a. Discuss the sequence for a page fault occurrence. (06 Marks)  
b. Discuss (i) FIFO page replacement (ii) Optimal page replacement. (06 Marks)  
c. Discuss basic mechanism of memory-mapped files with a neat diagram. (06 Marks)  
d. Discuss the benefits of a slab allocator. (02 Marks)

OR

- 10 a. Discuss file's attributes of an operating system. (07 Marks)  
b. Discuss basic file operations. (06 Marks)  
c. Discuss some of the operations associated with opening a file. (04 Marks)  
d. Discuss any 3 file types. (03 Marks)

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