

A-1137

Total Pages : 4

Roll No.

BCA (N)-102

Operating System

Examination February, 2026

Time : 2:00 Hrs.

Max. Marks : 70

Note :- This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. *Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.*

Section-A

Long Answer Type Questions (2×19=38)

Note :- Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

A-1137

(1)

P.T.O.

1. Define an Operating System. Explain its major functions in detail. Discuss how an OS acts as a resource manager and coordinator between hardware and software.
2. Define Deadlock. Explain the four necessary conditions for deadlock, deadlock detection, prevention, avoidance (Banker's Algorithm), and recovery techniques.
3. What is a Shell in UNIX ? Explain types of shells, shell architecture, shell scripting basics, and compare Linux shell features. Also discuss system calls and their role in OS.
4. Explain I/O Management in an Operating System. Discuss I/O devices, device drivers, interrupt handling, DMA, and various disk scheduling algorithms (FCFS, SSTF, SCAN, C-SCAN).
5. Distinguish between the following term :
 - (a) Multiprogramming Vs. Multitasking
 - (b) File Control Block (FCB) Vs. Process Control Bock (PCB)
 - (c) Direct Memory Access and Indirect Memory Access.

Section–B

Short Answer Type Questions (4×8=32)

Note :- Section ‘B’ contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. What is the difference between preemptive and non-preemptive scheduling ?
2. Explain different types of Operating Systems with suitable examples.
3. What is Inter-Process Communication (IPC) ? Explain message passing and shared memory mechanisms.
4. Explain the concept of Thrashing. What are its causes and how can it be prevented ?
5. What is Parallel Computing ? Explain its characteristics and applications.
6. Consider the following processes arriving at the times and with the burst times shown :

Process	Arrival Time	Burst Time
P1	0 ms	6 ms
P2	2 ms	4 ms
P3	4 ms	5 ms
P4	6 ms	3 ms

Using FCFS scheduling, calculate :

- (a) Gantt Chart
 - (b) Waiting Time of each process
 - (c) Average Waiting Time
 - (d) Turnaround Time of each process
 - (e) Average Turnaround Time
7. What is Memory Management ? Explain fixed and dynamic partitioning.
8. Define the following :
- (a) Process state
 - (b) Scheduling
 - (c) Dispatching
 - (d) System performance
 - (e) Fragmentation
