BCA-07/DCA-102

June - Examination 2026

BCA (2nd Year)/DCA Examination

Operating System - I

Paper : BCA-07/DCA-102

[*Time: **3** Hours*] [*Maximum Marks: **70***]

Note :- The question paper is divided into three Sections A, B and C. Write answers as per the given instructions in each section.

Section-A **7×2=14**

(Very Short Answer Type Questions)

Note :- Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum up to **30** words. Each question carries **2** marks.

1. (i) What do you mean by Shell?

   (ii) State Belady's anomaly.

   (iii) What is the fundamental goal of an operating system?

   (iv) What is a Trojan Horse in the context of system security?

   (v) What is a race condition? Give an example.

   (vi) What is the use of the fork system call?

   (vii) What is Cipher text? Give an example.

Section-B **4×7=28**

(Short Answer Type Questions)

Note :- Answer **any four** questions. You have to delimit your each answer maximum up to **200** words. Each question carries **7** marks.

2. Name the two fundamental models used in Interprocess Communication (IPC).
3. What is Semaphore? Explain its implementation as a wait and signal for providing process synchronization.
4. Explain the four necessary conditions for a deadlock to occur.
5. What is a thread? Discuss the difference between a thread and a process.
6. Explain the mechanism of swap-space management with a suitable example.
7. What is virtual memory? How is this implemented?
8. Explain the process of Encryption and Decryption with a suitable example.
9. Elaborate on the various fundamental services provided by an operating system to its users (such as Program Execution, I/O Operations, File System Manipulation, etc.)

Section-C

2×14=28

(Long Answer Type Questions)

Note :- Answer **any two** questions. You have to delimit your each answer maximum up to **500** words. Each question carries **14** marks.

10. Give the basics of communication in Client-Server System, including Sockets, RPC, and RMI.

11. Describe the evolution and salient features of various types of Operating Systems. Detail Batch Processing, Time Sharing, Real-Time, Multiprocessor, and Distributed Operating Systems.

12. Why is Memory Management necessary in an operating system? Given memory partition/holes of 100KB, 500KB, 200KB, 30KB, and 600KB. Processes request for allocation of memory space of 112KB, 317KB, 112KB, and 380KB in order. Show how the memory will be allocated to different processes using the first fit, best fit, and worst fit algorithms?

13. What is the need for Interprocess Communication between cooperating processes? Detail the Shared Memory System and Message Passing System models and explain how they facilitate IPC.
