Roll. No. : .....

BCA (N)-102

Second Semester Examination, 2024 (June)

[Operating System]

Time : 2 Hours] **[Maximum Marks : 70**

Note : This paper is of seventy (70) marks divided into two (2) 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)

Note : Section 'A' contains five (5) long answer type questions of Nineteen (19) marks each. Learners are required to answer any two (2) questions only. **2 × 19 = 38**

1. Answer the following :

(a) Explain the concept of virtual memory. What are the advantages and disadvantages of using virtual memory?

(b) Discuss the role of TLB (Translation Lookaside Buffer) in memory management.

(c) Describe the importance of parallel computing in modern operating systems.

2. Answer the following :

(a) Explain the need for disk scheduling. Discuss the goals and challenges of disk scheduling algorithms.

(b) Explain the role of system calls in kernel architecture with examples.

3. Answer the following :

(a) Describe the role of firewalls in enhancing operating system security.

(b) Discuss the role and functionalities of 'tar' and other file utilities in UNIX. Provide examples of their usage in archiving and compression.

4. Answer the following :

(a) Discuss the design considerations that make Linux a popular choice for operating system development.

(b) Define real-time operating system (RTOS). Discuss their characteristics and applications.

5. Compare and contrast Earliest Deadline First (EDF) and Earliest Least Laxity First (LLF) scheduling policies.

SECTION—B

(Short Answer Type Questions)

Note : Section 'B' contains eight (8) short answer type questions of Eight (8) marks each. Learners are required to answer any four (4) questions only. **4 × 8 = 32**

1. How does DMA mode of data transfer enhance IO performance ?

2. Describe the policies involved in disk partitioning and their practical implications.

3. Compare and contrast the First Fit and Best Fit memory allocation policies.

4. Discuss the role of device drivers in managing IO operations.

5. Describe common security breaches in operating systems. How can these be prevented ?

6. Explain rate monotonic scheduling and its significance in real-time systems.

7. Explain the role of user authentication in ensuring system security.

8. Describe the concept of microkernels in operating systems.

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