

11. Explain process synchronization. How semaphores are used for process synchronization ? Give an example.

12. Consider a system with a physical memory size of 8 frames and a page size of 4 KB. The system is using the Least Recently Used (LRU) page replacement policy. The following page reference string is given :

2, 3, 1, 4, 5, 2, 1, 5, 4, 3

- (a) Show the initial state of the page frames in the physical memory (before any page references).
- (b) For each page reference, indicate whether a page fault occurs and if so, which page is replaced.
- (c) Show the final state of the page frames in the physical memory after all page references are processed.

Note : Assume that initially, all page frames are empty.

13. Explain different security threats, such as viruses, worms, and denial of service attacks.

BCA-07/DCA-102

June – Examination 2023

BCA (Part II)/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.

Section-A

2×7=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) List the services of the Operating System.

(ii) Differentiate between processes and threads.

- (iii) Suppose the process is waiting to be assigned to a processor then the process is in which state.
- (iv) Differentiate between pre-emptive and non-pre-emptive scheduling.
- (v) Discuss the role of interrupts in I/O systems.
- (vi) What do you mean by batch processing ?
- (vii) State producer consumer problem.

Section-B **4×7=28**

(Short Answer Type Questions)

Note :- Answer any *four* questions. Each answer should not exceed **200** words. Each question carries 7 marks.

- 2. Discuss various functions/services of the operating system in detail.
- 3. What is segmentation ? Explain address translation in segmentation.
- 4. What is the Bus ? Explain the structure of bus with a suitable example.
- 5. Why Belady's Anomaly occurs ? Explain with example.
- 6. Write short note on file access control.

- 7. Explain the concept of a process in an operating system. Discuss the different process states and the process control block (PCB).
- 8. List differences between user level threads and kernel level threads.
- 9. Explain the memory hierarchy and the concept of fragmentation.

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. For the given information :

Process Number	Arrival Time	CPU burst
1	0	5
2	1	7
3	2	3
4	3	2

Compute the waiting and turnaround time for FCFS and SJF scheduling algorithm.