44 (5) OPSY BCA–HC–5026

2021

(Held in 2022)

OPERATING SYSTEM

Paper : BCA–HC–5026

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. 1×5=5

(a) What do you mean by multitasking operating system ?

(b) Define process and threads.

(c) Define short-term and long-term schedular.

(d) Define deadlock.

(e) What do you mean by relative and absolute path ?

2. $2 \times 5 = 10$

(a) Write *two* functions of operating system.

(b) What do you mean by pre-emptive and non pre-emptive scheduling ?

(c) Define page fault and page table.

(d) Define mutex and semaphore.

(e) What do you mean by translation look-aside buffer ?

3. Briefly explain the Dining philosopher problem with an example. 5

4. (a) Briefly explain the different ways to achieve mutual exclusion. 5

(b) Briefly explain the necessary conditions for deadlock. 5

OR

Briefly explain the different types of files.

5. Consider the following four processes with the length of the CPU burst time given in milliseconds — 5+5=10

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

(i) Calculate the average waiting time in milliseconds with Gantt chart using shortest remaining time first scheduling algorithm.

(ii) Calculate the average waiting time using first come first serve (FCFS) scheduling algorithm.

6. (a) Consider the following reference string : 5+5=10

7, 0, 1, 2, 0, 1, 2, 3, 4, 5, 2, 0, 1, 2 and frame size is '3'.

(i) Find the total number of page fault using optimal page replacement algorithm.

(ii) Find the hit and miss ratio using LRU (least recently used) page replacement algorithm.

OR

(b) Briefly explain the deadlock prevention and deadlock recovery techniques. 10

7. Define virtual memory. Briefly explain the file system security. 1+4=5

OR

Briefly explain the Banker's algorithm for deadlock avoidance. 5

8. Define system call. Briefly explain the multithreading concept. 1+4=5

OR

Briefly explain the NRU page replacement algorithm. 5