44 (SEM–5) BCA–HC–5026

2024

(Held in 2025)

OPERATING SYSTEM

Paper : BCA–HC–5026

Full Marks : 60

Time : Three hours

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

*Answer **any six** questions.*

1. *(a)* Fill in the blanks : 1×5=5

   (i) Process execution comprises alternate cycles of _____ and _____.

   (ii) A solution to diningphilosophers problem is to represent each chopstick as a _____.

   (iii) DMA stands for _____.

(iv) The main objectives of an operating system are _____ and _____.

(v) The operating system acts as ____.

(b) Define the following terms :   1×5=5

(i) Turnaround terms

(ii) Race condition

(iii) Process scheduling

(iv) Multiprogramming

(v) Caching

2. Answer the following questions :   2×5=10

(a) Define safe and unsafe states.

(b) What is segmentation ?

(c) What is critical section problem ?

(d) What is the function of dispatcher ?

(e) Define thread. How it is different from process ?

(f) Define deadlock with example.

(g) What is demand paging ?

3. *(a)* Define fragmentation. What are the differences between external and internal fragmentations ?   1+4=5

(b) List the conditions necessary for a deadlock to occur.   5

4. *(a)* How can the circular wait condition be prevented ?   3

(b) Explain the working of Peterson solution using semaphores.   5

(c) What is a Page fault ?   2

5. *(a)* Differentiate between long-term, short-term and medium-term schedulers.   6

(b) List the situations that may require the scheduler to make scheduling decisions.   4

6. *(a)* What do you mean by preemptive scheduling algorithm ? Explain *any one* algorithm.   6

(b) What is file system mounting ? Explain.

4

7. *(a)* Explain the working of Dining philosopher problem. 6

(b) What is device controller ? Explain the goals of I/O software. 4

8. Write short notes : *(any two)* 5×2=10

(a) Banker's Algorithm

(b) Page Replacement Algorithm

(c) Responsibilities of Operating System

(d) State Transition Diagram

———