B.C.A. / B.VOC 3rd Sem. (Main / Back / Ex) Examination, Dec. – 2024

Bachelor of Computer Application / Information Technology

Operating System Concepts Paper   Code – 0327003 / 0397903

Time: Three Hours   **[Maximum Marks: 75]**

Note: Attempt all the sections as per instructions.

Section–A

(Very Short Answer type questions)

Note: Attempt all five questions. Each question carries 03 marks. Very Short answer is required not exceeding 75 words.   **5×3=15**

1. What is Process Control Block? What is its significance in operating system?

2. Give the drawbacks of contiguous file allocation method.

3. Give core idea of any two strategies to deal with deadlocks.

4. Explain the 'Turnaround Time' and 'Response Time' with example.

5. What do you understand by Internal fragmentation and External fragmentation? Explain with example.

Section–B

(Short Answer type questions)

Note: Attempt any two questions out of the following three questions. Each question carries 7.5 marks. Short answer is required not exceeding 200 words.   **2×7.5=15**

6. Define 'Deadlock' and state necessary conditions for happening of a deadlock in a system.

7. Consider a system with variable memory partition scheme. Suppose at a time, memory partitions of 150 K, 340 K, 220 K, 300 K and 430 K are available, in the given order, for user processes. Also suppose that four user processes of size 180 K, 310 K, 75 K, and 210 K enter the system in the given order. How would each of the
   (i) First-fit
   (ii) Best-fit
   (iii) Worst-fit
   scheme puts these processes in memory partitions?

8. Explain critical section problem. Give three requirements for the solution to this problem.

(Long Answer Type Questions)

Note: Attempt any three questions out of the following five questions. Each question carries 15 marks.
Answer is required in detail.   **3×15=45**

9. Discuss the role of 'Semaphores' in the process synchronization.

10. The CPU burst time requirements of five processes P_0, P_1, P_2, P_3, and P_4 along with their arrival times at the ready queue and priorities are as shown below:

Process	Arrival Time	CPU Burst Time (in ms)	Priority
P_0	0	7	2
P_1	2	4	1
P_2	5	8	5
P_3	7	5	4
P_4	11	3	3

Find the average waiting time for preemptive and non-preemptive priority scheduling. Given that smaller number represents higher priority.

11. Explain, with example, SCAN disk scheduling scheme.

12. What are the various methods for accessing files? Explain any two of them in detail.

13. Write short notes on any two of the following:
    (i) Types of operating systems
    (ii) Thrashing
    (iii) Virtual memory