

25/1664

**B.C.A. (Fourth Semester)
Examination, 2025
Second Paper
(Operating System)**

*Time : Two Hours]**[Maximum Marks : 75***Note :** Attempt all sections as per Instructions.**Section-A****(Very Short Answer Type Questions)**

Note : Attempt all the 05 (Five) questions.
Each questions carries 02 (two) marks
and answer of each question should not
exceed 50 words. $5 \times 2 = 10$

1. (a) Why address binding is required?
- (b) What is demand paging?
- (c) What is virtual memory?
- (d) What are the various criteria for a good process scheduling algorithm?
- (e) Write short note on short term scheduler (CPU Scheduler)

Section-B**(Short Answer Type Questions)**

Note : Attempt all the 05 (five) questions out of total 08 (Eight) questions. Each questions carries 05 (five) marks and answer of each question should not exceed 100 words. $5 \times 5 = 25$

2. (a) Explain the concept of thrashing with the help of diagram?
- (b) What are the difference between real time system and time sharing system?
- (c) Distinguish internal fragmentation and external fragmentation. How external fragmentation can be solved?
- (d) What is meant by system call? Discuss about types of system calls.
- (e) With a neat sketch, explain the process state diagram.
- (f) What is demand paging? Why it is called as lazy swappers? Explain in detail.
- (g) Explain the need of file protection. Give any two methods of file protection.

- (h) Given free memory partitions of 100K, 500K, 200K, 300K, and 600K (in order), how would each of the First-fit, Best-fit, and worst-fit, algorithms place processes of 212K, 417K, 112K, and 426K (in order)?

Section-C

(Long Answer Type Questions)

Note : Attempt any 02 (Two) questions out of total 04 (Four) questions. Each question carries 20 (Twenty) marks and answer of each question should not exceed 400 words. $2 \times 20 = 40$

3. (a) What are the criteria for evaluating the CPU scheduling algorithms? Explain the round Robin scheduling algorithm with a suitable example.
- (b) (i) Consider the following and find out the possible resource allocation sequence with the help of deadlock detection algorithm processes p0, p1, p3, p4 resources A,B,C allocation [0 1 0, 2 0 0, 3 0 3, 2 1 1, 0 0 2] Max 0 0 0, 2 0 2, 0 0 0, 1 0 0, 0 0 2] Available [000]

- (ii) What is a safe state and what is its use in deadlock avoidance? Explain.
- (c) (i) Write short notes on following.
- (I) Overlays
 - (II) Dynamic Linking
 - (iii) Swapping
 - (iv) Dynamic Loading
- (ii) What is Belady's anomaly? Explain with the help of suitable example.
- (d) A disk drive has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 53. The queue of pending requests, in FIFO order, is 98, 183, 37, 122, 14, 124, 65, 67. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms?
- (i) FCFS
 - (ii) SSTF
 - (iii) SCAN