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# Daffodil International University

**Faculty of Science & Information Technology**
**Department of Computing and Information System**
**Final Examination, Spring-2026**
**Course Code: CIS232 / CIS323 Course Title: Operating Systems**
**Section:20_A, 20_B, R_A; Level: 2 Term: 2**
**Exam Duration: 2 Hours** **Marks: 40**

## Answer ALL Questions Sequentially

***[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]***

| Sl. | | Question | Marks | CLO |
|---|---|---|---|---|
| 1. | a) | What is starvation problem in priority scheduling algorithm? How to solve it? | 2 | CLO1 |
| | b) | What do you mean by PCB? Describe the details of it. | 4 | |
| | c) | Describe the services provided by the operating system | 4 | |
| 2. | a) | Paging and Swapping are two memory management strategies. How paging and swapping play an important role in OS? | 2 | CLO2 |
| | b) | What do you mean by segmentation? Sketching (draw) the logical view of segmentation to manage memory. | 4 | |
| | c) | Displaying the way of handling page fault in Operating system with a short descript ion. | 4 | |
| 3. | | | 5+5 | CLO3 |

| Process | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 |
|---|---|---|---|---|---|---|---|---|---|
| Arrival time | 1 | 1 | 2 | 4 | 6 | 6 | 7 | 8 | 8 |
| Burst time | 3 | 4 | 1 | 4 | 5 | 3 | 1 | 2 | 3 |

a. Find out the average waiting time and turnaround time where time quantum = 2
b. Find out the average waiting time and turnaround time using shortest job first (Preemptive) algorithm.

| | | | | |
|---|---|---|---|---|
| 4. | a) | A system has 4-page frames available in main memory for storing process pages. Using an appropriate page replacement algorithm to assess the number of page faults and page hit, considering following page reference string to enhance real-world operating system:<br>**1, 2, 1, 8, 0, 7, 6, 3, 1, 5, 8, 0, 4, 9, 0, 20, 1, 7, 0, 5, 4, 8, 9, 4, 6, 7, 10, 2, 0** | 5 | CLO3 |

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| | | | | |
|---|---|---|---|---|
| 4 ✓ | *b)* | The processes P1 to P8 given in the table (in order) need to be placed in memory. Five memory blocks of variable sizes are available.<br>I. In your opinion, which algorithm is best for allocating these processes into memory in terms of size and why? Explain your answer.<br>II. Allocate the processes to these memories by using the mentioned (in above question) memory allocation algorithm and perform the memory allocation with necessary diagram.<br>Block M1 M2 M3 M4 M5<br>Size 100K 40K 250K 70K 300K | **2+3** | **CLO3** |

| Process | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
|---|---|---|---|---|---|---|---|---|
| Size | 70 | 245 | 15 | 280 | 260 | 90 | 150 | 190 |
| Turn | 2 | 3 | 1 | 1 | 4 | 2 | 3 | 2 |