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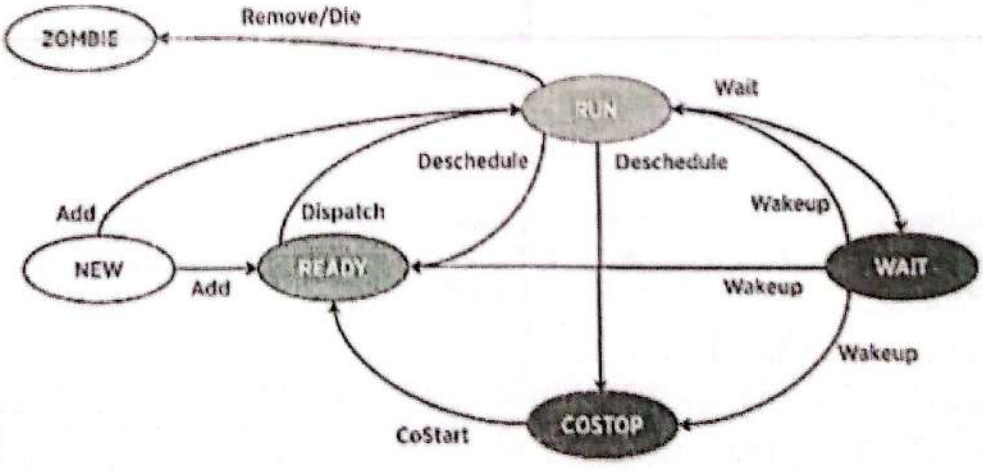
# Daffodil International University

**Faculty of Science & Information Technology**
**Department of Computer Science and Engineering**
**Mid Semester Examination, Spring-2024**
**Course Code: CSE323 Course Title: Operating Systems**
**Level: 3 Term: 2**

**Exam Duration: 1.5 Hours** **Marks: 25**

## Answer ALL Questions

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

| | | | | |
|---|---|---|---|---|
| 1. | *a)* | **List** the elements comprising a computer system. **Find** out the most crucial component among them. **Show** the consequences for other components if this essential component is neglected during the integration process. | [2.5] | CO1 |
| | *b)* | **Show** the difference between Layered Architecture and Modular Architecture of OS Structure. | [2.5] | |
| 2. | *a)* | <br>**Fig: 1**<br>Assume there is a process named P1. **Explain** the life-cycle of the process and **illustrate** the transition from one state to another state according to Fig. 1.<br>**Interpret** the term Zombie process here. | [4] | CO2 |
| | *b)* | Is it possible to demonstrate an interrupt driven operating system without context switching? Give a proper **explanation** with a case supporting your reason. | [3] | |

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| | | | | |
|---|---|---|---|---|
| 3. | *a)* | **Construct** the **Gantt Chart** and **identify** the **average waiting time and average response time** for the following processes in round robin where **TQ = 2.5**. | **[6]** | **CO3** |

| PN. | AT | BT |
|---|---|---|
| P0 | 16 | 24 |
| P1 | 11 | 11 |
| P2 | 6 | 3 |
| P3 | 3 | 2 |
| P4 | 29 | 5 |
| P5 | 3 | 7 |
| P6 | 7 | 15 |
| P7 | 13 | 1 |

| | | | | |
|---|---|---|---|---|
| | *b)* | Priority Scheduling is a method of scheduling processes that is based on priority. Consider the following set of processes with the length of the CPU burst time given in millisecond. In this given scenario you will assume lowest integer value will not have the highest preference and highest integer value will not have the lowest preference. | **[7]** | |

| PN | Priority | Arrival Time | Burst Time |
|---|---|---|---|
| P1 | 2 | 6 | 1 |
| P2 | 7 | 1 | 9 |
| P3 | 9 | 1 | 3 |
| P4 | 6 | 3 | 6 |
| P5 | 5 | 4 | 5 |
| P6 | 12 | 5 | 16 |
| P7 | 10 | 15 | 8 |
| P8 | 7 | 14 | 4 |
| P9 | 3 | 59 | 1 |

**a. Construct** the **Gantt Chart** for the above table using the Priority Preemptive algorithm and **identify** the **Average Turn Around Time, Average Waiting Time, Average Response Time and Throughput.**

**b. Identify** the **problem** in priority scheduling? Would you relate it with your solution according this above problem statement given in the table?