STAMFORD UNIVERSITY BANGLADESH

Department of Computer Science and Engineering

Midterm Examination, Summer 2022 Semester

CSI 313: Operating System

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Date and Time: 24/08/22 & 8:00 PM-010:00 PM

Batch: MCSE **Campus:** Siddeswari

Duration: 2 hours **Full Marks: 30**

(There are **THREE** questions. Answer all of them. Figures in the right margin indicate marks

1. a) "OS is a resource allocator" – justify your answer. [02]

   b) CPU scheduling is an optimization problem. Why ? [03]

   c) Write a short notes on system call. [03]

   d) Write down the task of the following system calls: [02]
   Fork(), exit(), abort(), wait()

2. a) Illustrate the convoy effect in CPU scheduling by using a scenario. [02]

   b) What are the negative side of priority scheduling? Give some solution of these problems? [02]

   c) Define IPC? Using an example, illustrate the producer-consumer paradigm in shared memory IPC. Assume fixed buffer size. [03]

   d) What is dispatch latency? How context switching is related with time quantum in RR scheduling? [03]

3. The following processes are being scheduled using a preemptive, priority-based, round-robin scheduling algorithm [10]

Process	Priority	Burst	Arrival
P1	8	15	0
P2	3	20	0
P3	4	20	20
P4	4	20	25
P5	5	5	45
P6	5	15	55

Each process is assigned a numerical priority, with a higher number indicating a higher relative priority. The scheduler will execute the highest priority process. For processes with the same priority, a round-robin scheduler will be used with a time quantum of 10 units. If a process is preempted by a higher-priority process, the preempted process is placed at the end of the queue.

1. Show the scheduling order of the processes using a Gantt chart.
2. What is the turnaround time for each process?
3. What is the waiting time for each process?