

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

ONLINE WRITTEN ASSESSMENT**WINTER SEMESTER, 2019-2020****DURATION: 1 Hour****FULL MARKS: 30**

CSE 4501: Operating Systems

There are **4** questions. Answer all of them.

Figures in the right margin indicate marks.

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1. Google's Chrome browser opens each new tab in a separate process. Would the same benefits have been achieved if Chrome opens each new tab in a separate thread? Explain your answer. 5

 2. A well-known company has hired you for designing a system running I/O-bound processes and CPU-bound processes. While considering different processes, you find out there is a mix of long and short processes. For better and secured performance, you have differentiated the processes to execute in the kernel-level while the rest will execute at the user-level.
Now, as an OS developer, your task is to select a scheduling algorithm that will give better performance for the system. Explain your choice. 5

 3. A car is manufactured at each stop on a conveyor belt in a car factory. A car is constructed from the following parts - chassis, tires, seats, engine (assume this includes everything under the hood and the steering wheel), the top cover, and painting. Thus there are 6 tasks in manufacturing a car. However, tires, seats or the engine cannot be added until the chassis is placed on the belt. The car top cannot be added until tires, seats and the engine are put in. Finally, the car cannot be painted until the top is put on. A stop on the conveyor belt in your car company has four technicians assigned to it - Abe, Bob, Charlie, and Dave. Abe is skilled at adding tires and painting, Bob can only put the chassis on the belt, Charlie only knows how to attach the seats, and Dave knows how to add the engine as well as how to add the top. 10
Write pseudo code for Abe, Bob, Charlie and Dave to be able to work on the car, without violating the task order outlined above. **Use Mutex Locks in your solution.**

 5. Draw the Gantt Chart and find the average **Turn Around Time** (show details calculations) for non-preemptive Priority Scheduling 5+5

| Process | Burst Time | Priority | Arrival Time |
|---------|------------|----------|--------------|
| P1 | 16 | 1 | 2 |
| P2 | 5 | 4 | 0 |
| P3 | 7 | 3 | 1 |
| P4 | 13 | 2 | 3 |
| P5 | 1 | 1 | 5 |