**Advanced Operating Systems Design – Spring 2022**

**Quiz 3 (03/01/2022)**

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (First Last)

Student R#: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Score: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Total: 3%)

**Question 1:** (1%) Energy Efficient Scheduling of Parallelizable Jobs

In the paper “Energy Efficient Scheduling of Parallelizable Jobs”, how can the scheduler minimize energy consumption of Parallelizable Jobs? What are the **cons** for the scheduler taking into account minimizing energy consumption?

**Question 2:** (2%) Cluster Computing

In a cluster center, we have 2 computing nodes and a master node which runs the scheduler. A user submits 4 jobs with the 50% I/O percentage. Each job requires 20s seconds to complete, including 10 seconds of CPU and 10 seconds of I/O time. The scheduler can decide how to split the jobs on 2 computing nodes:

1. 2 jobs per computing node
2. 3 jobs on the first computing node and 1 job on the second computing node

Please answer the following questions:

1. What is the average CPU utilization of the cluster in Case **A**?

How much time to complete all 4 jobs?

1. What is the average CPU utilization of the cluster in Case **B**?

How much time to complete all 4 jobs?