## COL331/COL633

## **OPERATING SYSTEMS**

MINOR-1

Robit

**MARKS**: 60

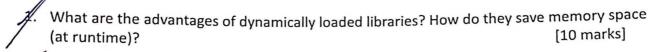
TIME: 1 HOUR

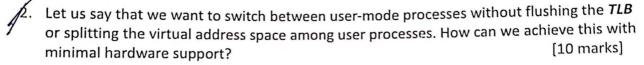
2020-23

## INSTRUCTIONS:

- 1. All the questions are compulsory.
- 2. No doubts will be addressed during the exam. Make your assumptions.

## QUESTIONS:





How does segmentation allow us to define per-CPU memory regions? Where are these regions (possibly) stored in the virtual address space? Why is this more efficient than other methods that rely on storing data at pre-specified locations on the stack? [10 marks]

Why are *idr* trees used to store *pid* structures? Why can't we use *BSTs*, *B-Trees*, and *hash tables*?

5. Consider the case of a *signal handler* - a function that is registered with the operating system that the OS needs to invoke when it needs to send a signal to a process.

 $[4 \times 5 \text{ marks}]$ 

- The arriving signal causes a new function to run in the address space of a process by interrupting its execution. Should it use the same stack or a different stack? What are the pros and cons?
- For the signal handler to take any effect, it needs to make changes to global variables. How should the programmer deal with such asynchronous events?
- Can a graphical user interface that takes input from the mouse benefit from signal handlers?
- IV. How is a signal handling function expected to complete? Where will it return to and how?