

Name:

Duration: 15 min

ID:

Grade:/30

Questions**Part I: Understand**

(6 pts) Why did we use a **dynamic braking resistor** in the experiment? Was it required in the fan load experiment? Explain briefly, specifically considering the load type in this experiment.

(2 pts) How do you change the direction of rotation of a DC motor?

(2 pts) How do you change the direction of rotation of an induction motor?

Part II: Solve

(10 pts) Consider the crane hoist system. Suppose that V/f control is used, the applied frequency is 50 Hz and the system operating in upwards direction at steady state.

What is the direction of the motor torque? Consider that upwards direction corresponds to the positive motor speed.

At which quadrant does the motor operate?

Draw a torque speed curve of the motor and the load torque. Show the operating point.

What is the name of the operating mode?

Part III: Think

(10 pts) Consider the measurements you took during the experiment. Propose a method to find inertia seen by the motor. Neglect inertia of the gearbox and wheel.