

Assignment 6 - Motors

due Wednesday, April 8 1998

Question 1

Match each type of motor shown in the first column with the application shown in the second column that is most appropriate. Note that other types of motors could be used for many of these applications.

1. 120 V 60 Hz AC induction motor	a) motor for an electric car
2. "universal" motor	b) pen positioning motor for an X-Y plotter
3. series-field DC motor	c) motor for the beaters in a hand-held kitchen mixer
4. PM motor with variable-frequency power supply	d) a high-efficiency variable-speed motor
5. stepper motor	e) pump motor for a dishwasher

Question 2

A motorized hoist turns a 2-m diameter pulley to lift a 100 kg load. The load must be raised at 0.314 m/s. What is the power output of the motor (in watts and HP) while the load is being raised? If the efficiency of the motor is 80%, how much electrical power must be supplied?