



**2006 State Competition**  
**FFA Agricultural Mechanics Contest**  
**University of Missouri**  
**50 points**

Contestant # \_\_\_\_\_  
Contestant Name \_\_\_\_\_  
Chapter \_\_\_\_\_

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## Electrical Motors

**A.** Identify the American National Standard Institute (ANSI) symbol for ground from those taped to the table. (3 points) \_\_\_\_\_

**B.** Note the motor labeled #1. Also note pulley #1. A belt will drive/connect to pulley #3. Find the theoretical speed of the shaft attached to the pulley #3 (**5 points**) (**Show your work for partial credit.**)

**C.** Motor Identification (**2 points each**) (Use motors tagged 1-4)

a. Which motor tagged is the permanent split capacitor motor? \_\_\_\_\_

b. Which motor tagged is the split- phase start induction run motor? \_\_\_\_\_

**D.** Using table A-2 located on the last sheet, find the voltage drop for motor #4 with 100 feet of 12 gauge 7 strand copper wire (**4 points**) \_\_\_\_\_ (**Show your work for partial credit.**)

**E.** Match the letter of the part that corresponds with electrical motor parts found on the table. (2 points each)

\_\_\_\_\_ Capacitor

\_\_\_\_\_ End bell

\_\_\_\_\_ Running Winding

\_\_\_\_\_ Resilient Mount

\_\_\_\_\_ Squirrel cage rotor

\_\_\_\_\_ Starting Winding

\_\_\_\_\_ Centrifugal mechanism

\_\_\_\_\_ Brush Holder

**F.** Use the photo tachometer to find actual speed of motor #5, Determine the number of pairs of poles of the motor based on motor speed. **(5 points) (Show your work for partial credit)**

**Motor Selection**

**G.** You have two motors. The first is a .4 hp split phase motor that is rated at 4.5 amps. The time rating on the motor is CONT and the SF of the motor is 1.4. This motor costs \$35.49. The second motor is a .5 hp split phase motor that is rated at 5.5 amps. The time rating on this motor is CONT and the SF of this motor is 1. This motor costs \$39.95. The application for this motor requires ~ 1/2 hp. Which is the best motor for the application? **(5 points) (Show your work for partial credit)**

**Motor Wiring**

**H.** Note the magnetic controller that is controlled by a start stop station. Examine the leads of the motor, refer to the electric motor nameplate, and write in the terminal on the magnetic controller that the leads from the motor will connect to. **(5 points)**

<u>Motor</u>	<u>Magnetic Controller Terminal</u>
Lead A	T1 _____
Lead B	T2 _____
	T3 _____
	L1 _____
	L2 _____
	L3 _____
	1 _____
	2 _____
	3 _____

**Scorecard for Electrical Motors Competition**

<u>Criteria</u>	<u>Points Possible</u>	<u>Points Earned</u>
A. ANSI symbol	3points	_____
B. Theoretical Speed	5 points	_____
C. Motor Identification	4 points	_____
D. Voltage Drop	4 points	_____
E. Part identification	16 points	_____
F. Photo Tachometer	5 points	_____
G. Motor Selection	5 points	_____
H. Motor Wiring	5 points	_____
I. Safety	<u>3 points</u>	_____
<b>Total</b>	50 points	<div style="border: 1px solid black; width: 100px; height: 30px; display: inline-block;"></div>

