

Students, please affix one of your self-adhesive identification labels to this space. Do not obscure other parts of this page with the label. If you do not have a self-adhesive identification label, please complete the following information. Write your name as it appears on your badge.

Your Name: _____

Participation Number:

Two letter state abbreviation. →

State code (0301, 0302, to 0350) ↑

Team member number (01, 02, 03, or 04) ↑

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Students, please do not write or mark within this box.

Judges, after this skill sheet has been scored and double checked, write the total score for this activity in the blank below.

Skill Activity Score: _____

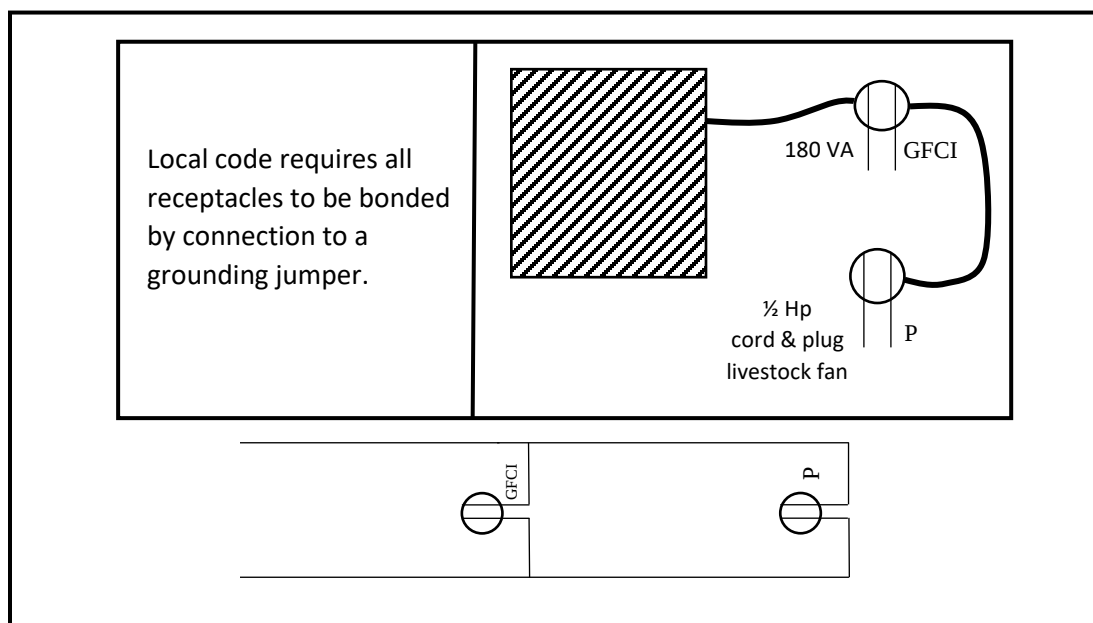
Judges Initials: _____

2018 National Agricultural Technology & Mechanical Systems Career Development Event Electrical Systems Skill Activity

Problem: The 120 V (nominal) receptacles will be part of the circuits in a livestock barn that has a dirt floor. Properly wire the GFCI and duplex receptacle in accordance with the National Electrical Code, the attached electrical schematic (floor plan) and the ladder diagram. **Answer the questions related to the given wiring problem before you begin wiring. (Back of this page)**

Directions:

1. Eye protection (safety glasses) is required at all times.
2. All tools and electrical supplies are provided.
3. **Optional:** You may use the attached wiring diagram to sketch the wiring problem. This portion will not be scored.
4. Complete the wiring of the GFCI and duplex receptacle in the surface mounted metal boxes in accordance with the National Electrical Code with the attached electrical schematic drawing.
5. Select from either the 14/2 WG, or 12/2 WG conductor placed before you, that is to be used between the boxes, and install the correct wires.
6. Select the correct overcurrent protection.
7. Only prepare the wire ends and make the connections, **do not cut any wire.**
8. You may back wire the GFCI and the duplex outlet.
9. **Do not attach any of the devices to the boxes.**
10. **Do not tuck any of the conductors (wire) into the boxes.**
11. **Do not tighten the cable box connectors around the wire.**
12. Submit this sheet to the officials upon completion of the problem or when time is called.



Questions: DO NOT WRITE ON THE REFERENCE MATERIALS PROVIDED!!

1. According to NEC Table 430.248, what is the full load current in amperes for the ½ Hp, single phase fan motor?
Write your answer in the blank on line 1 of your scantron sheet.

_____ (1pts.)
2. The livestock fan motor should be considered a continuous duty application. According to NEC article 430.22, what should the calculated load in amperes be for the fan motor?
Write your answer in the blank on line 2 of your scantron sheet.

_____ (1pts.)
3. What is the total load in amperes for the circuit?
Note: VA = Watts; W = V x A
Write your answer in the blank on line 3 of your scantron sheet.

_____ (1pts.)
4. Because this is a general purpose branch circuit and the actual load, in addition to the fan motor load, on the circuit is unknown or may vary, it is recommended that you de-rate the circuit to 80% of the load rating for the overcurrent protection device and the branch circuit conductor. Based on your total load calculation which of the following conductors and over current protection should be used?
Write your answer in the blank on line 3 of your scantron sheet (1pts.)

A. 14 AWG and 15 ampere overcurrent protection

B. 12 AWG and 20 ampere over current protection

Evaluation Score Sheet (For contest officials only)

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Item		Points Possible	# of opportunities	Points each	Points Earned
1-4.	Points for questions	4	1	All or none	
CDE official will score the following items on the scan sheet					
5.	Workability of wiring problem	4	1	All or none	
6.	Correct wire	2	1	All or none	
7.	Correct overcurrent protection	2	1	All or none	
8.	Branch circuit grounding (bond) wire properly used	2	2	1	
9.	Wire hooks and back-wire connections made and used properly on GFCI	4	4	1	
10.	Wire hooks and back-wire connections made and used properly on duplex outlet	4	4	1	
11.	Splicing conductors (size, tight, no exposed wire)	2	2	1	
12.	Identified terminals correctly used	4	4	1	
13.	Subpanel bonded correctly	2	1	All or none	
14.	Safety & work habits	- 2pts./violation			
		Total Pts. Possible = 30		Total Earned	