FY18 Ag Mechanics CDE – Description Sheet

Written Exam: **25** problem solving/multiple choice questions – 5 from each event area

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Team Activity:

Area Information – Students will need to be familiar with measuring, calculating bills of material, and planning electrical circuits.

State Information - Metal fabrication and basic electrical circuits. Students will work as a team to construct a metal project using the GMAW process. Welding plans will be provided. Students will also plan and wire a basic electrical circuit.

FY18 Team Activity Tools

Teams advancing to the State CDE will need to bring:

- 4 ½" angle grinder
- 25' extension cord (or longer)
- Clamps ("C" clamps, locking pliers or vise type clamps)
- Framing square
- Combination square
- Soapstone (or other marker for metal)
- Welding pliers
- Cordless drill
- Drill bit 1/4" (2)
- Phillips screwdriver
- Flat screwdriver
- Cable splicer's knife
- Wire strippers
- Crimping tool
- Level (torpedo or 2' level)
- Ball peen hammer
- Center punch
- 5/16" nut driver
- Welding helmet for each team member
- Welding gloves for each team member
- Safety glasses for each team member
- Welding jacket (coverings) for each team member
- Hearing protection for each team member

Provided:

- Vise
- Welders

Skill Activities:

A. **Machinery and Equipment**:

Area Information

Poulan Pro Operator's Manual Model #PB20H42LT Lawn Tractor, & Mower Parts Manual and a pull behind sprayer manual.

Students will need to be familiar with the Poulan Pro Operator's and Repair Parts Manuals in order to solve problems and answer questions related to equipment care, maintenance, operation, and parts selection. Students will also need to be familiar with the maintenance and operation of a pull behind sprayer.

Electronic versions of manuals are available on the Ag. Ed. website/CDE/Ag. Mechanics, Study Resources.

State Information

New Holland Workmaster 37 sub-compact Operator's Manual

Students will need to be familiar with the New Holland Work Master 37 Operator's Manual in order to solve problems and answer questions related to equipment care, maintenance, operation, parts selection and attachments (tillage, mowing and loading equipment)

Electronic versions of manuals are available on the Ag. Ed. website/CDE/Ag. Mechanics, Study Resources in addition to the links below.

New Holland Workmaster 37 sub-compact Operator's Manual

https://partstore.agriculture.newholland.com/us/parts-search.html?csid=b2f6f880b0a580c5ec18ac26321c5a03&sl=EN&currency=#epc::mr2454826ag13146063

Bush Hog RTG & GR Series Tillers

http://www.bushhog.com/uploads/documents/BHRotaryTiller-RTGOM-04-16.pdf

Bush Hog® BH10 Single-Spindle Rotary Cutter

http://www.bushhog.com/uploads/documents/BHRotaryCutterBH10SeriesOM-15.pdf

Quicke Q-Series Loaders

http://media.alo.se/fotoweb/archives/5043-Loaders/PDF%20arkiv/Operators%20Manuals/MANUALS/Manuals%20PDF%20(aktuella)/Lastare/Quicke/60018754%20A2%20Q-series%20Quicke%20EN.pdf

B. **Electrical Systems -** Necessary tools will be provided. You may bring colored pencils for use on drawing diagrams.

Area Information - Boxes will be mounted to 2" x 4" boards. The contestant will choose between 14/2 and 12/2 NM Cable and install it. The contestant will make hooks and secure the wires to the correct locations, but will not cut wire. Connections to boxes and connection of devices inside the box must be made according to NEC recommendations and accepted wiring practices (AAVIM)

State Information - Students need to be familiar with the methods and materials necessary to wire a branch circuit(s). The contestant will be required to:

- correctly wire devices and service entrance panels
- select appropriate overcurrent protection
- identify/select conductors/cables
- correctly bond all devices and boxes

Connections to boxes and connection of devices inside the box must be made according to NEC recommendations and accepted wiring practices (AAVIM)

C. Compact Equipment

Area and State Information

Briggs and Stratton model # 12S432 OHV Engine
Briggs & Stratton OHV Air Cooled Engine Manual, sections 1, 4 & 5

Students will need to be familiar with the general specifications, fuel/carburetion and governor systems for a Briggs and Stratton OHV Model 12S432 engine.

D. Environmental and Natural Resources:

Area Information

Students should be able to take rod readings, measure distance with tape and/or instruments.

Determine percent of slope or grade. Students will be required to determine soil loss using the universal soil loss equation.

Resources

- Refer to documents which may be found on the Ag. Ed website under study resources for the Ag. Mechanics CDE
    - Manual for Erosion and Sediment Control in Georgia
    - Appendix B-2: Estimating Soil Erosion With the Universal Soil Loss Equation
    - Agrisicence Resources for High School Sciences: Soil Erosion
    - Universal Soil Loss Video Link - https://www.youtube.com/watch?v=9Zous6X6svs
    - Web Soil Survey Link - https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Web Soil Survey Instructions: Click the green Start WSS button to begin. On the left hand side of the screen under Quick Navigation, select Georgia in the State window and choose any county in Georgia then click view to download the satellite image. To create an Area of Interest (AOI), click on the AOI icon on the tool bar to select the drawing tool; either AOI tool, rectangle or polygon will work. Draw your AOI on an area that you want soil data for. Once your AOI has been established, click on the Soil Map tab to download soil data for the AOI. Once the soil data has downloaded, click on the Soil Data Explorer tab, then click on the Soil Properties and Qualities tab and choose soil erosion factors from the pop up menu on the left side of the screen. This will allow you to access the K factor needed for a soil loss equation. **Further instructions on using the Web Soil Survey may be found in the Manual for Erosion and Sediment Control section B-1 which is posted under the Study Resource section for the Ag. Mechanics CDE on the Georgia Ag. Ed website.**

State Information – Students will need to be familiar with the set-up and leveling of surveying instruments. The contestant may be required to:

- take rod readings; including elevation and distance with an automatic level and/or instruments.
- determine field slope.
- design and calculate water drainage systems.
- determine area.

References: (Additional references may be sent as they are identified.)

http://fisheries.tamu.edu/files/2013/09/Pond-Building-A-Guide-to-Planning-Constructing-and-Maintaining-Recreational-Ponds.pdf

https://www.youtube.com/watch?v=4UwCC8NIly4

http://aqua.ucdavis.edu/DatabaseRoot/pdf/USDA590C.PDF

E. Structures:

Regional/Area/State Information

Welding Skill will be SMAW (Stick) Welding

Welding will be required to be completed in the flat position.

Welding may be required as any one of the following types of welding joints: Butt, Tee, Lap, or Pipe

Welds will be required on ⅛" up to ¼" x 4" x 5" flat metal, metal pipe, or a combination.

Welds may be single or multiple pass.

Welding Equipment List for Contestants-

1. Teams will be penalized under "Safety" on score sheet for not having the following items:

   Welding Helmet – Shade 10 minimum

   Body cover- leathers, Shop Jackets, non-flammable Coveralls

   Welding Gloves

   Pliers/Tongs

   Safety glasses –approved with shields

   Wire brush

   Soapstone

   Chipping Hammer

2. Please do not share tools and equipment between team members (bring one of each for each student).
3. All other materials and tools will be provided.

Approved Safety Glasses are required for Team Activity and Skill Activities. (Meets or exceeds ANSI Z87.1-2003 safety standards.)