

***DISCOVERY WELDING
CAREER DEVELOPMENT EVENT
RULES AND REGULATIONS
TEAM COMPETITION***



ALABAMA FFA ASSOCIATION

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January 2023

Discovery Welding Career Development Event

PURPOSE:

This event is designed to help students learn more about various welding processes and gain skills needed to further this career path.

ELIGIBILITY AND REQUIREMENTS:

- All North District FFA chapters are eligible and may bring a total of 4 competitors.
- Contestants must meet **ALL** the following requirements to be eligible to compete in the contest.
 - Competitors must be on the chapters roster and show as submitted to the National FFA Organization for the current year.
 - Currently in the 7th or 8th grade
- If a cell phone or smartwatch is seen or heard in the possession of a competitor, that individual student will be disqualified from the competition and receive a score of zero.

District Awards/Sponsors

Calhoun Community College

Miller Electric

Lincoln Electric

Sexton Welding Supply

Rogers Group Inc

Polaris

Turner Construction

EVENT GENERAL RULES

1. Contest will be scored by industry experts and all scores are final. The lowest scoring individual from each team will not be counted toward the team score.
2. All competitors will need to bring pencils and a clipboard.
3. Contestants may not communicate with teammates other than during the team activity.
4. Participants must stay with their assigned group. Contest Officials will not attempt to locate a participant that is in the wrong group.
5. Participants will have 30 minutes to complete the test portion, and 10 minutes to complete team activity. Contest Official have the option to extend the time for all contestants but not decrease the allowed time. When time is called all participants must stop.
6. FFA advisors, parents, bus drivers, or anyone affiliated with the participants are not allowed in the shop area during the contest.
7. The top four teams and high scoring individual will be recognized after the contest.
8. Tiebreaker Policy- 1) Highest team test score, 2) Highest Team Activity score

Contest Layout

1) Test Portion

- a. The test will consist of 40 questions pulled from the study guide. The test will be multiple choice and use a ZipGrade sheet.

2) Equipment/Tool Id

- a. Minimum of ten items will be displayed by pictures on a screen and/or real equipment. The items selected will be general Equipment/Tools used in the welding industry and come from the Equipment List.
- b. Competitors will have to write the correct name. Misspelled or unreadable answers will be counted incorrect.
- c. Competitors will receive a copy of the Equipment list to use during this section.

3) Team Activity

- a. Competitors will have multiple welds that they will visually inspect as a team. Students will use the grading rubric for this portion.
- b. Students should know what each welding process looks like, what different SMAW electrode welds look like, and all visual defects.
- c. If no weld defects are noticed, then NONE should be written in the answer box.
- d. Correct welding terminology should be used when answering all questions.
- e. Partial points will not be given except on the weld defect section.
- f. The blank question section will be filled in day of contest and will not be known to competitors until contest day.

Discovery Welding CDE District Tabulation Sheet

Participant	Event Phase (Maximum Score)	Participant Score	Total Score
<u>Participant #1</u>	Written Exam	100 pts	
	Equipment/Tool Identification	100 pts	
	Team Activity	60 pts	
Participant # 1's Total (Maximum score possible is 260 points)			

<u>Participant #2</u>	Written Exam	100 pts	
	Equipment/Tool Identification	100 pts	
	Team Activity	60 pts	
Participant # 2's Total (Maximum score possible is 260 points)			

<u>Participant #3</u>	Written Exam	100 pts	
	Equipment/Tool Identification	100 pts	
	Team Activity	60 pts	
Participant # 3's Total (Maximum score possible is 260 points)			

<u>Participant #4</u>	Written Exam	100 pts	
	Equipment/Tool Identification	100 pts	
	Team Activity	60 pts	
Participant # 4's Total (Maximum score possible is 260 points)			

TEAM RANKING	
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TOTAL TEAM SCORE (Top 3 participant scores will make up the team score. The maximum score possible is 780 points.)	
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Team Activity Sheet

FFA CHAPTER NAME: _____

Weld	Questions	Write in Correct Answer
<u>Weld #1</u>	Welding Process Used 10 pts	
	10 pts	
	Welding Position 10 pts	
	Weld Joint Type 10 pts	
	List any weld defects 20 pts	

<u>Weld #2</u>	Welding Process Used 10 pts	
	10 pts	
	Welding Position 10 pts	
	Weld Joint Type 10 pts	
	List any weld defects 20 pts	

<u>Weld #3</u>	Welding Process Used 10 pts	
	10 pts	
	Welding Position 10 pts	
	Weld Joint Type 10 pts	
	List any weld defects 20 pts	

<u>Weld #4</u>	Welding Process Used 10 pts	
	10 pts	
	Welding Position 10 pts	
	Weld Joint Type 10 pts	
	List any weld defects 20 pts	

Middle School Welding Equipment/Tool Id List

Acetylene Cylinder	Level
Anvil	Auto Darkening Welding Hood
C Clamp	Steel Toed Boots
Center Punch	TIG Collet Body
Chipping Hammer	Welding Gloves
Chop Saw	Wire Wheel
Combination Square	Anvil
Cutting Disc	Cup Brush
Cylinder Cart	Tungsten Grinder
Drill Press	MIG gun diffusor
Electrode Holder	MIG gun nozzle
File	Face Shield
Fillet Weld Gauge	Ground Clamp
Flux Cord Wire	Wire Feeder (MIG)
Fuel Regulator	Track Torch
GMAW Power Source	Voltage Setting on MIG Machine
Grease Gun	Foot Pedal (for TIG)
GTAW Power Source	Mixed Gas Regulator
Hand Grinder	Passive Welding Hood
MagDrill	Welding Magnets
Metal Scribe	Nozzle Gel
MIG Gun	MIG Contact Tip
Mig Wire	Wire Speed Setting on MIG Machine
Needle Nose Pilers	TIG Backing Cap
Needle Scaler	TIG Collet
Oxy-Fuel Cutting Torch	TIG Nozzle
Oxygen Cylinder	Pedestal Grinder
Oxygen Regulator	Pipe Wraparound
Plasma Cutting Machine	Soapstone
Portable Band Saw	
SMAW Power Source	
Stick Electrode	
Tape Measure	
Tig Torch	
Tiger Paw/Flap grinding disk	
Tip Cleaner	
Try Square	
Tungsten Electrodes	
Vise Grips	
Welding Magnet	
Welper	
Wire Brush	

Ag Mechanics CDE - General Ag 1

MULTIPLE CHOICE

1. The practice of uniting metal parts by heating or compression is called
- a. plumbing
 - b. welding
 - c. transforming
 - d. direct current

ANS: B PTS: 1

2. The metal to be joined or welded together is classified as the
- a. standard metal
 - b. tack metal
 - c. base metal
 - d. bead

ANS: C PTS: 1

3. The discharge of electricity through an air space is called the
- a. arc
 - b. gap
 - c. amperage
 - d. electrode

ANS: A PTS: 1

4. Flux coated metal welding rods are referred to as
- a. flux
 - b. beads
 - c. electrodes
 - d. sticks

ANS: C PTS: 1

5. The external material on electrodes that remove impurities from the base metal is called
- a. a shield
 - b. flux
 - c. slag
 - d. paste

ANS: B PTS: 1

6. The layer formed on top of the weld caused by the flux and impurities of the base metal floating to the top is called
- a. flux
 - b. bead
 - c. puddle
 - d. slag

ANS: D PTS: 1

7. A small weld to hold base metals together temporarily is called a/an
- a. tack weld
 - b. bead
 - c. temporary work load
 - d. negative weld

ANS: A PTS: 1

8. The molten part of the weld where the heat is being applied is called the
- a. bead
 - b. current
 - c. flame
 - d. puddle

ANS: D PTS: 1

9. The metal that is deposited by the electrode, welding wire or filler rod during the welding process is called the

- a. bead
- b. base metal
- c. filler metal
- d. hot metal

ANS: A PTS: 1

10. The maximum pull in pounds per square inch that a weld can withstand is referred to as
- a. auxillary strength
 - b. psi
 - c. compression strength
 - d. tensile strength

ANS: D PTS: 1

11. An association or society that establishes codes and standards for the welding industry is known as the
- a. American Wedling Group
 - b. Society of Amercian Welders
 - c. American Welding Society
 - d. National Metal Organization

ANS: C PTS: 1

12. An arc welding process that uses flux coated rods is called
- a. TIG welding
 - b. stick welding
 - c. MIG welding
 - d. wire welding

ANS: B PTS: 1

13. Another name for stick welding is
- a. SMAW
 - b. MIG
 - c. TIG
 - d. GMAW

ANS: A PTS: 1

14. SMAW stands for
- a. Shielded Material Arc Welding
 - b. Shielded Metal Arc Welding
 - c. Standard Metal Arc Welding
 - d. Standard Material Arc Welding

ANS: B PTS: 1

15. An arc welding process that uses a wire that is fed automatically at a constant speed as an electrode is called
- a. TIG welding
 - b. brazing
 - c. wire welding
 - d. stick welding

ANS: C PTS: 1

16. Another name for wire welding is
- a. MIG welding
 - b. TIG welding
 - c. brazing
 - d. SMAW

ANS: A PTS: 1

17. MIG stands for
- a. Material Inactive Gas
 - b. Metal Inert Gas
 - c. Material Inverted Gas
 - d. Metal Inverted Gas

ANS: B PTS: 1

18. An arc welding process that uses a tungsten tip and filler rod to create a bead shielded by gas is called
- a. TIG
 - b. MIG
 - c. SMAW
 - d. stick welding

ANS: A PTS: 1

19. TIG stands for
- a. Teranium Inert Gas
 - b. Tungsten Inert Gas
 - c. Teranium Inactive Gas
 - d. Tungsten Inverted Gas

ANS: B PTS: 1

20. Both MIG and TIG welding can also be referred to as
- a. GMAW
 - b. SMAW
 - c. WMAW
 - d. CMAW

ANS: A PTS: 1

21. GMAW stands for
- a. Gas Material Arc Welding
 - b. Gas Metal Advanced Welding
 - c. Gas Material Advanced Welding
 - d. Gas Metal Arc Welding

ANS: D PTS: 1

22. A process that uses both oxygen and acetylene for cutting or welding is referred to as
- a. Oxyacetylene
 - b. Acetygen
 - c. Oxylene
 - d. OA welding

ANS: A PTS: 1

23. Which of the following gases can serve as an alternative for acetylene?
- a. diesel fuel
 - b. propane
 - c. Argon
 - d. CO2

ANS: B PTS: 1

24. Which of the following gases can serve as an alternative for acetylene?
- a. butane
 - b. gasoline
 - c. kerosene
 - d. Argon

ANS: A PTS: 1

25. Which of the following gases can serve as an alternative for acetylene?
- a. helium
 - b. oxygen
 - c. kerosene
 - d. natural gas

ANS: D PTS: 1

26. A welding process using the oxyacetylene rig is referred to as
- a. branding
 - b. soldering
 - c. brazing
 - d. TIG

ANS: C PTS: 1

27. Tips used in oxyacetylene welding have how many holes in the end of them?
- a. one
 - b. two
 - c. four
 - d. six

ANS: A PTS: 1

28. Which of the following statements is true concerning torch tips for the oxyacetylene rig?
- a. A small tip is used for thick metal.
 - b. 000 size tip is smaller than a size 10 tip
 - c. Tip size does not matter when brazing.
 - d. Tip numbers range up to 100.

ANS: B PTS: 1

29. Which of the following statements is **not** true concerning the oxyacetylene rig?
- a. The acetylene hose has notched fittings.
 - b. The oxygen hose has fittings that are not notched.
 - c. The oxygen hose is green in color.
 - d. The acetylene hose is orange in color.

ANS: D PTS: 1

30. Which of the following statements is **not** true concerning the oxyacetylene rig?
- a. The oxygen operating pressure must be set at 80 psi.
 - b. Never operate acetylene pressure at 15 psi or more.
 - c. Acetylene is a fuel.
 - d. The work area must be properly ventilated.

ANS: A PTS: 1

31. Which of the following statements is **not** true concerning the oxyacetylene rig?
- a. Wear protective clothing.
 - b. Stand in front of the gauges when opening the cylinders so you can see the amount of pressure.
 - c. The acetylene hose has fittings with left-handed threads.
 - d. The oxygen hose has fittings with right-handed threads.

ANS: B PTS: 1

32. What is the term that means to bond filler material to a base metal? It is the key to success in brazing.
- a. fusion
 - b. welding
 - c. tinning
 - d. bonding

ANS: C PTS: 1

33. When brazing, what is the phrase that means to alternately move a flame into and out of an area to achieve temperature control?
- a. "work the flame"
 - b. "control the flame"
 - c. "alter the flame"
 - d. "play the flame"

ANS: D PTS: 1

34. Acetylene is dangerous because it is
- a. compressed
 - b. flammable
 - c. explosive
 - d. all of the above

ANS: D PTS: 1

35. Gas leaks on the oxyacetylene rig are checked with
- a. compressed air
 - b. a flame
 - c. soapy water
 - d. teflon

ANS: C PTS: 1

36. Removing gas from oxyacetylene equipment is known as
- a. bleeding the lines
 - b. gas removal
 - c. blowing out the lines
 - d. fuel and air removal

ANS: A PTS: 1

37. The acetylene cylinder valve is never opened more than
- a. a half turn
 - b. one turn
 - c. two turns
 - d. it doesn't matter

ANS: A PTS: 1

38. A device on an oxyacetylene rig that controls the flow of gas is called a
- a. gauge
 - b. regulator
 - c. cylinder
 - d. torch

ANS: B PTS: 1

39. Which of the following types of flames is the correct one for heating and cutting with the oxyacetylene rig?
- a. brazing flame
 - b. oxidizing flame
 - c. carbonizing flame
 - d. neutral flame

ANS: D PTS: 1

40. Welding helmets worn for stick welding are required to have what number shaded lens?
- a. No. 5
 - b. No. 10
 - c. No. 12
 - d. No. 15

ANS: B PTS: 1

41. Safety glasses or goggles worn when using the oxyacetylene torch should be what number shaded lens?
- a. No. 5
 - b. No. 8
 - c. No. 10
 - d. No. 12

ANS: A PTS: 1

42. The percentage of time that a welder can operate without overheating is referred to as the
- a. work load
 - b. life cycle
 - c. current load
 - d. duty cycle

ANS: D PTS: 1

43. A 20% duty cycle welder should weld only how many minutes out of every hour at full capacity?
- a. 10 minutes
 - b. 12 minutes
 - c. 15 minutes
 - d. 20 minutes

ANS: B PTS: 1

44. Current that reserves its direction of flow frequently is referred to as
- a. Alternating current
 - b. Direct current
 - c. Recycled current
 - d. Replaced current

ANS: A PTS: 1

45. Current that flows in one direction according to how the welder is set is referred to as

- a. Alternating current
- b. Direct current
- c. Recycled current
- d. Replaced current

ANS: B PTS: 1

46. A device on AC welders that convert high voltage and low amperage from utility power lines to low voltage and high amperage is referred to as
- a. transformers
 - b. recifiers
 - c. inverters
 - d. converters

ANS: A PTS: 1

47. The “E” in E6013 stands for what according to the Numerical Coding for Electrodes?
- a. Energy
 - b. Electric
 - c. Energizer
 - d. Electrode

ANS: D PTS: 1

48. The “60” in E6013 represents what according to the Numerical Coding for Electrodes?
- a. tensile strength in hundreds of pounds per square inch
 - b. tensile strength in thousands of pounds per square inch
 - c. compression strength in hundreds of pounds per square inch
 - d. compression strength in thousands of pounds per square inch

ANS: B PTS: 1

49. The “1” in E6013 represents what according to the Numerical Coding for Electrodes?
- a. welding material
 - b. welding size
 - c. welding current
 - d. welding position

ANS: D PTS: 1

50. The “3” in E6013 represents what according to the Numerical Coding for Electrodes?
- a. welding material
 - b. welding size
 - c. welding current
 - d. welding position

ANS: C PTS: 1

51. Which of the following would **not** be considered a welding position?
- a. overhead
 - b. flat
 - c. horizontal
 - d. lateral

ANS: D PTS: 1

52. In the MIG welding process, gas pressure should be set at approximately
- a. 10-15 psi
 - b. 25-30 psi
 - c. 40-50 psi
 - d. It doesn't matter

ANS: B PTS: 1

53. The types of gas used in the MIG welding process would **not** include which of the following:
- a. Acetylene
 - b. Argon
 - c. CO₂
 - d. Argon and CO₂ mix

ANS: A PTS: 1

54. Which of the following gases is considered to be flammable:

- a. argon
- b. CO₂
- c. acetylene
- d. They are all flammable

ANS: C PTS: 1

55. What is one advantage of MIG welding over stick welding?
- a. It can be used to weld thicker gauge metal.
 - b. It does not have slag to be chipped off.
 - c. A MIG welder is cheaper to purchase than a stick welder.
 - d. There are no advantages.

ANS: B PTS: 1

56. Most MIG welding equipment is
- a. manual
 - b. robotic
 - c. automatic
 - d. semiautomatic

ANS: D PTS: 1

57. Which of the following is not a weld defect?
- a. undercut
 - b. insufficient penetration
 - c. pits
 - d. behind cut

ANS: D PTS: 1

58. In the TIG welding process, which of the following is **not** true?
- a. Tungsten electrodes are not consumed during the welding process.
 - b. Gas pressure should be set at approximately 25-30 psi.
 - c. A filler rod is normally used when welding especially on thicker metal.
 - d. Tungsten electrodes have a very low melting point.

ANS: D PTS: 1

59. In the TIG welding process, which of the following is **not** true?
- a. It produces a cleaner bead than MIG
 - b. Argon can be used as the shielding gas
 - c. It is faster than MIG
 - d. It is easier to weld thinner gauge metal than with stick welding.

ANS: C PTS: 1

60. Which of the following is not a part of the TIG welding torch?
- a. gauge
 - b. collet body
 - c. collet
 - d. Tungsten electrode

ANS: A PTS: 1

61. Which of the following types of fire extinguishers should be available for use in the welding area?
- a. Class A only
 - b. Class B only
 - c. Class C only
 - d. Class A, B and C

ANS: D PTS: 1

62. Which of the following is needed in the welding area in case of emergency?
- a. ladder
 - b. welding gas
 - c. fire blanket
 - d. spare electrodes

ANS: C PTS: 1

63. To start an arc by touching the metal with the electrode and then raising it is known as the
- a. tapping method
 - b. touching method
 - c. down and up method
 - d. arcing method

ANS: A PTS: 1

64. To start an arc by dragging the electrode across the metal about an inch is known as the
- a. arcing method
 - b. start up method
 - c. scratch method
 - d. dragging method

ANS: C PTS: 1

65. When welding, one bead or layer of filler metal is known as a/an
- a. path
 - b. pass
 - c. weave
 - d. foundation bead

ANS: B PTS: 1

66. When making several passes during the welding process, the first pass made in a joint is called the
- a. foundation pass
 - b. initial pass
 - c. root pass
 - d. base pass

ANS: C PTS: 1

67. Another name for a fillet weld is called a/an
- a. "T" weld
 - b. "Butt" weld
 - c. "Lap" weld
 - d. "Overhang" weld

ANS: A PTS: 1

68. The angle of the electrode when stick welding should be
- a. 90 degrees from the vertical position
 - b. 60 degrees from the vertical position
 - c. 30-45 degrees from the vertical position
 - d. 10-15 degrees from the vertical position

ANS: D PTS: 1

69. Which of the following can help you determine the correct arc length for stick welding?
- a. the sound of the arc
 - b. the appearance of the bead
 - c. welding experience
 - d. all of the above

ANS: D PTS: 1

70. An arc that is the correct length when stick welding should sound like
- a. water boiling
 - b. bacon frying
 - c. eggs boiling
 - d. the sound doesn't matter

ANS: B PTS: 1

71. If the arc length is too long when stick welding, a _____ sound is heard.
- a. boeing
 - b. scratching
 - c. soft
 - d. squealing

ANS: A PTS: 1

72. What happens if the arc length is too short when stick welding?
- a. The metal gets too hot.
 - b. The welder will shut off.
 - c. The electrode sticks to the metal.
 - d. Nothing. It needs to be short.

ANS: C PTS: 1

73. What will be the result if the amperage is set too low when stick welding?
- a. The molten puddle will burn a hole in the base metal.
 - b. It will be difficult to strike the arc and keep it running.
 - c. It will result in a wide bead.
 - d. It will cause a lot of splatter.

ANS: B PTS: 1

74. What will be the result if the amperage is set too low when stick welding?
- a. Nothing will happen.
 - b. The welder will shut off.
 - c. It will result in a narrow, stringy bead.
 - d. It will result in a wide bead.

ANS: C PTS: 1

75. Indicators of excessive heat when welding would include:
- a. the puddle burns through the metal
 - b. the arc is very noisy
 - c. neither a nor b
 - d. both a and b

ANS: D PTS: 1

76. Indicators of excessive heat when welding would include:
- a. It is difficult to manage the puddle.
 - b. The arc will not strike.
 - c. The bead is wavy.
 - d. The bead is narrow.

ANS: A PTS: 1

77. A _____ bead is a bead that is made without weaving.
- a. stringer
 - b. flat
 - c. line
 - d. restricted

ANS: A PTS: 1

78. The _____ is a low spot in metal where the force of a flame has pushed out molten metal.
- a. hole
 - b. puddle
 - c. crater
 - d. convex

ANS: C PTS: 1

79. When stick welding several beads on top of each other, slag must be removed after each bead is welded or there will be _____ inside the weld.
- a. hot pockets
 - b. puddles
 - c. voids
 - d. You don't have to remove the slag.

ANS: C PTS: 1

80. Which of the following types of pipe should have the most ventilation to the work area when welding?
- a. mild steel
 - b. stainless steel
 - c. galvanized
 - d. It doesn't matter.

ANS: C PTS: 1

81. The output of a welder is relatively
- a. low voltage and high amperage
 - b. high voltage and low amperage
 - c. high voltage and high amperage
 - d. low voltage and low amperage

ANS: A PTS: 1

82. A chipping hammer is used to
- a. prepare edges for welding
 - b. remove scale from steel
 - c. temper beads
 - d. remove slag

ANS: D PTS: 1

83. Which of the following would **not** be considered a safety item when welding.
- a. welding helmet
 - b. safety glasses
 - c. welding gloves
 - d. spare electrodes

ANS: D PTS: 1

84. The temperature of the electric welding arc is about
- a. 400 degrees F
 - b. 840 degrees F
 - c. 1800 degrees F
 - d. 9000 degrees F

ANS: D PTS: 1

85. Welding tables should be made of
- a. concrete
 - b. masonite
 - c. metal
 - d. wood

ANS: C PTS: 1

86. Burning clothes on a human should be extinguished with
- a. fire blanket
 - b. fire extinguisher
 - c. sand
 - d. any of these

ANS: A PTS: 1

87. Water in a welding area is useful for
- a. receiving sparks from piercing
 - b. extinguishing fires
 - c. cooling metal
 - d. all of the above

ANS: D PTS: 1

88. If only one kind of electrode for all stick welding is to be purchased, the best choice is an
- a. E6010
 - b. E6011
 - c. E6013
 - d. E7018

ANS: B PTS: 1

89. For most welding in agricultural mechanics the best electrode size is
- a. 1/16 inch
 - b. 1/8 inch
 - c. 3/16 inch
 - d. 1/4 inch

ANS: B PTS: 1

90. The correct arc length when welding is approximately
- a. 1/8 inch
 - b. 1/4 inch
 - c. 3/8 inch
 - d. 1/2 inch

ANS: A PTS: 1

91. When welding, the operator sees by
- a. daylight
 - b. fluorescent light
 - c. light from the arc
 - d. all of the above

ANS: C PTS: 1

92. The appearance and strength of a bead are influenced by
- a. amps
 - b. angle
 - c. speed
 - d. all of the above

ANS: D PTS: 1

93. The recommended weave pattern for the beginning weldor doing down hand welding is
- a. circular
 - b. figure eight
 - c. J
 - d. T

ANS: A PTS: 1

94. In metal, the most rapid movement of heat is
- a. down
 - b. up
 - c. horizontal
 - d. equal in all directions

ANS: B PTS: 1

95. To make a hole with an electrode is called
- a. cutting
 - b. electroding
 - c. piercing
 - d. brazing

ANS: C PTS: 1

96. The best amperage setting for cutting with a stick welder is _____ higher than for welding.
- a. 25 %
 - b. 50 %
 - c. 75 %
 - d. 100 %

ANS: B PTS: 1

97. Which of the following welds is the most difficult to make.
- a. flat
 - b. horizontal
 - c. vertical down
 - d. vertical up

ANS: D PTS: 1

98. Joining parts by melting them together is known as
- a. oxidation
 - b. carbonizing
 - c. fusion welding
 - d. heat welding

ANS: C PTS: 1

99. A spring loaded clamp attached to an electrical cable and is not insulated and carries current between the welding table and to the welder is called a
- a. electrode clamp
 - b. ground clamp
 - c. welder clamp
 - d. positive clamp

ANS: B PTS: 1

100. How many cables does a welder have?
- a. 1
 - c. 3