1. When the edges of two pieces of metal are heated until they flow together, the process is called:
   a. Oxygen welding
   b. Braze welding
   c. Fusion welding
   d. Fission welding
2. The metal rod or wire that forms part of an electric welding circuit is called a/an:
   a. Electrode
   b. Welding rod
   c. SMAW rod
   d. Prod
3. Which of the following welding processes uses electrical power?
   a. Shielded Metal Arc Welding
   b. Gas Metal Arc
   c. Gas Tungsten Arc
   d. All of the above
4. In which arc welding process is a non-consumable electrode used?
   a. GMAW
   b. GTAW
   c. SMAW
   d. Brazing
5. Short, temporary weld beads made to hold or align the metals to be joined are known as:
   a. Tack welds
   b. Boxing fillets
   c. Single pass groove welds
   d. Stringer beads
6. Which of the following action(s) is/are involved in joint fit up?
   a. Verifying groove angle
   b. Verifying high/low
   c. Verifying root opening
   d. All of the above
7. The voltage value across the welding arc depends on:
   a. Open-circuit current
   b. Arc length
   c. Circuit polarity
   d. Size of electrode
8. What is the primary purpose of the inert gas used in the GTAW welding process?
   a. Reduce electrode consumption
   b. Eliminate arc blow
   c. Shield the weld area from contamination
   d. Prevent splatter
9. What is the purpose of the coated electrodes for SMAW welding?
   a. Forms gas shield
   b. Produces slag covering
   c. Adds desired chemical elements
   d. All of the above
10. In which arc welding process is a continuous consumable wire electrode used?
   a. GMAW
   b. GTAW
   c. SMAW
   d. All of the above
11. When it is possible to reposition the work, welds are easiest and simplest to make in the:
   a. Flat position
   b. Vertical position
   c. Downhand position
   d. Overhead position
12. What causes arc blow?
   a. Magnetic fields
   b. Arc too short
   c. Use of AC current
   d. All of the above
13. Spatter is caused by arc blow, current set too high, excessive arc length or:
   a. Using the wrong polarity
   b. Welding in wide gap joints
   c. Improper joint grooving
   d. Contamination of the base metal
14. Which of the following oxyacetylene flames is recommended when gas welding mild steels?
   a. Neutral to slightly carburizing
   b. Carburizing
   c. Slightly oxidizing
   d. Oxidizing, two-to-one gas ratio
15. Which of the following characteristics must be considered when welding aluminum?
   a. Low melting point
   b. Oxide coating
   c. Cleanliness of the joint
   d. All of the above
16. How many preheat flames inner cones will appear if the cutting tip has seven orifices?
   a. 6
   b. 3
   c. 4
   d. 7
   e. 
17. In any oxygen cutting operation, one of the major safety hazards is the danger of:
   a. Falling objects
   b. Sparks and hot metal
   c. Electrical shock
   d. Noise from the equipment
18. Which of the following metal cutting operations can be achieved with oxygen cutting equipment?
   a. Bevel cuts
   b. Piercing holes
   c. Cutting of shapes
   d. All of the above
19. The process of hardening, tempering, and annealing ferrous metals is called:
   a. Heat treating
   b. Machining
   c. Refining
   d. Forging
20. The system of numbers which indicates pipe wall thickness is called:
   a. Pipe wall thickness numbers
   b. The OD system
   c. The ID system
   d. Pipe schedule numbers
21. The flux in shielded metal arc welding:
   a. Protects your eyes against the arc flash
   b. Contains spatter and sparks
   c. Makes the arc more stable
   d. All of the above
22. A welding machine with a duty cycle rating of eighty percent (80%) can deliver its rated maximum welding current for a total of:
   a. 8 min. before idling 2 min. to cool
   b. 16 min. before idling 4 min. to cool
   c. 48 min. before idling 12 min. to cool
   d. 80 min. before idling 20 min. to cool
23. The workpiece lead is always connected to the:
   a. Bare end of the electrode
   b. Base metal
   c. Negative terminal
   d. Positive terminal
24. Gaseous inclusions in welds are called:
   a. Slag
   b. Porosity
   c. Undercut
   d. Blow holes

25. SMAW is used as a standard terminology abbreviation for the following:
   a. Shielded Metal Arc Welding
   b. Shielded Metal After Welding
   c. Shielded Manual Arc Welding
   d. All of the Above

26. The portion of weld metal that is above the base metal is called:
   a. Excess weld
   b. Reinforcement
   c. Crown
   d. Cap

27. Which of the following metals cannot be efficiently cut with OFC?
   a. High-carbon steel
   b. Low-carbon steel
   c. Stainless steel
   d. All of the above

28. The melting point of carbon steel is approximately:
   a. 2250 degrees F
   b. 2780 degrees F
   c. 3005 degrees F
   d. 3333 degrees F

29. Which type of GMAW metal transfer results in the least amount of penetration?
   a. Globular
   b. Short circuiting
   c. Spray
   d. Pulsed spray

30. Which of the following gases is not commonly used as a shielding gas for GTAW?
   a. Argon
   b. Carbon dioxide
   c. Helium
   d. Argon/helium

31. The tail of a welding symbol can be used for:
   a. Denoting welding process requirements
   b. Denoting welding procedure requirements
   c. Denoting welding electrode requirements
   d. All of the above
32. In GMAW, the distance from the end of the contact tube to the arc is:
   a. Arc length
   b. Stick out
   c. A and B
   d. All of the above
33. Of the following, which is not a type of metal transfer in GMAW?
   a. Spray
   b. Globular
   c. Pulsed arc
   d. Open circuiting
34. Ultraviolet light may be used with which NDE method?
   a. VT
   b. PT
   c. MT
   d. B and C
35. Which of the following may be detected with VT?
   a. Large surface crack
   b. Undercut
   c. Under fill
   d. All of these
36. For single bevel-groove weld symbols, the line of the AWS weld symbol running perpendicular to the reference line is always drawn on which side?
   a. On the right
   b. On the left
   c. On either side, depending on company policy
   d. Does not matter
37. Of the following, which is not a cause of undercutting when using SMAW?
   a. Weld current too high
   b. Travel speed too slow
   c. Improper electrode manipulation
   d. Use of electrode in a position other than that for which it was designed
38. If a welder is continually turning out rejectable work, the welding inspector should:
   a. Inspect his work more critically
   b. Ask that the welder be fired
   c. Require that the welder be retested for qualification
   d. Instruct the welder in the proper technique
39. Arc blow can be caused by:
   a. Magnetic field distortion
   b. Improper work lead (ground) location
   c. Welding at the end of a joint
   d. All of these

40. In SMAW, an increase in arc length results in:
   a. Increased current; increased voltage
   b. Decreased current; increased voltage
   c. Increased current; decreased voltage
   d. Decreased current; decreased voltage

41. In GMAW, the type of metal transfer requiring a special power source is:
   a. Spray
   b. Globular
   c. Pulsed arc
   d. Short circuiting

42. In GMAW, the welding variable controlled by the wire feed speed is:
   a. Arc length
   b. Voltage
   c. Current
   d. Stick out

43. As temperature increase:
   a. Tensile strength increases
   b. Tensile strength decreases
   c. Ductility increases
   d. B and C

44. Welding inspection should be performed:
   a. Before welding begins
   b. During welding
   c. After welding is completed
   d. All of the above

45. Hydrogen in the molten weld metal can cause:
   a. Cracking
   b. Incomplete penetration
   c. Porosity
   d. All of the above

46. For an SMAW electrode, the next to the last number in the designation refers to:
   a. The tensile strength of the weld deposit
   b. The positions in which it can be used
   c. The type of coating
   d. The recommended type of current
47. The welding process that typically uses a tubular electrode is:
   a. SMAW
   b. GMAW
   c. FCAW
   d. OFW
48. ET is the abbreviation for:
   a. Eddy current testing
   b. Environmental testing
   c. Emissive testing
   d. None of the above
49. The flux covering on an SMAW electrode provides which of the following?
   a. Gas shielding for the molten pool
   b. Arc stabilization
   c. Deoxidization
   d. All of these
50. The welding process that uses a non-consumable electrode is:
   a. GMAW
   b. GTAW
   c. FCAW
   d. SMAW
51. An E71T-1 electrode designation is for which welding process?
   a. GTAW
   b. FCAW
   c. SMAW
   d. GMAW
52. A break in the arrow line has what significance?
   a. Welding must first be done on the arrow side
   b. Welding must first be done on the other side
   c. Welding must be done alternately on both the arrow and the other sides
   d. The broken arrow line segment points to that member which receives some preparation
53. All welding symbol information referring to the arrow side of the joint is found:
   a. In the tail
   b. Above the reference line
   c. Below the reference line
   d. Where the inspector decides
54. All welding symbol require which of the following basic elements in their construction?
   a. Reference line, arrow and tail
   b. Reference line, and arrow
   c. Reference line, arrow, weld symbol
   d. Reference line only
55. What position is depicted in figure 2?
   a. 6G
   b. 6F
   c. 6GR
   d. None of these
56. Under bead cracking is primarily caused by:
   a. A source of hydrogen
   b. Restraint
   c. Excessive preheat
   d. All of these
57. Which welding process uses a constant current power source?
   a. GMAW
   b. SMAW
   c. GTAW
   d. B and C
58. The width of the cut produced during a cutting process is referred to as:
   a. Root opening
   b. Kerf
   c. Bevel
   d. Chamfer
59. For the 2G position in pipe welding:
   a. The axis of the pipe is vertical and the plane of the weld is horizontal
   b. The axis of the pipe is horizontal and the plane of the weld is vertical
   c. The pipe is not fixed
   d. The axis of the pipe and the plane of the weld are at 45 degree angles with the vertical plane:
60. The size of the arrow side weld in Figure 6 is:
   a. 1/4 inch
   b. 5/16 inches
   c. 2 inches
61. The length of the other side weld in Figure 6 is:
   a. 1 inch
   b. 2 inches
   c. 4 inches
   d. Continuous down the length of the joint
62. The pitch of the other side weld in Figure 6 is:
   a. ¼ inch
   b. 4 inches
   c. 5/16 inch
   d. 1 inch

63. Which of the following welds is not considered applicable for a butt joint?
   a. V-groove
   b. Plug
   c. U-groove
   d. J-groove

64. Which of the following is not a type of weld joint?
   a. Lap
   b. T
   c. Fillet
   d. Butt

65. The pipe welding test position in which the pipe is horizontal and rotated so that welding takes place at or near the top is designated as:
   a. 2G
   b. 2F
   c. 3G
   d. 1G

66. The most efficient NDE method for discovery of undercut on the face of the weld is:
   a. VT
   b. UT
   c. MT
   d. PT

67. Porosity in GMAW can be caused by:
   a. Drafts
   b. Too little shielding gas flow
   c. Too much shielding gas flow
   d. All of these

68. The overhead fillet position is designated as:
   a. 5F
   b. 4F
   c. 3F
   d. 2F

69. In pipe groove welding, the 45 degree fixed position is designated as:
   a. 1G
   b. 2G
   c. 5G
   d. 6G
70. Which of the following conditions can cause slag inclusions in a weld?
   a. Poor welder technique
   b. Careful interpass cleaning
   c. Insufficient preheat
   d. B and C
71. To be most effective, visual inspection must be conducted:
   a. Before welding
   b. During welding
   c. After welding
   d. All of these
72. Which of the conditions below can cause porosity in a weld?
   a. Welder technique
   b. Damp electrodes
   c. Oily base metal
   d. All of these
73. Which of the following discontinuities is not associated with GTAW?
   a. Lack of fusion
   b. Slag inclusions
   c. Tungsten inclusions
   d. Porosity
74. Which of the following discontinuities are not associated with GMAW?
   a. Slag inclusions
   b. Porosity
   c. Tungsten inclusions
   d. A and B
75. The type of safety device generally used on an oxygen cylinder is a________.
   a. fusible plug
   b. check valve
   c. pressure safety disc
   d. spring-loaded plug
76. Oxygen is stored in cylinders at a pressure of ____________ to ____________ psig?
   a. 50 to 100
   b. 1000 to 2000
   c. 2000 to 2640
   d. 3000 to 3500
77. The __________ ____________ ____________ has prepared specification for the construction of oxygen cylinders.
   a. American Welding society
   b. Department of Commerce
   c. Interstate Commerce commission
   d. Department of Gases

78. No part of the oxygen cylinder is less than _______ inch thick.
   a. ¼"
   b. ½"
   c. ¾"
   d. 1"

79. How far should the oxygen cylinder valve be turned on?
   a. ½ Turn
   b. ¾ Turn
   c. 1/8 turn
   d. All the way

80. Where is the pressure safety disc located at on the oxygen cylinder?
   a. Top of the cylinder
   b. On the cylinder valve
   c. Bottom of the cylinder
   d. Top and bottom of the cylinder

81. What should be on the cylinders when not in use?
   a. Safety cap
   b. Regulator
   c. Chain
   d. Both a and c

82. Capacities of the cylinders are given in __________ ____________
   a. Cubic inches
   b. Square feet
   c. Square inches
   d. Cubic feet

83. What two item are added together to form acetylene
   a. Calcium carbide and oxygen
   b. Calcium carbide and water
   c. Calcium carbide and acetone
   d. None of the above
84. Acetylene should never be used above __________ psi?
   a. 5 psi
   b. 10 psi
   c. 15 psi
   d. 20 psi

85. Toxic fumes may be created when welding operations heat fluxes and metal containing such chemicals as ____________
   a. Cadmium
   b. Zinc
   c. Chromium
   d. All of the above

86. Some personal factors that may be responsible for causing accidents include
   a. Stress, illness, fatigue
   b. Tripping, falling
   c. Time of day, housekeeping
   d. Both a and c

87. Some physical factors that may be responsible for causing accidents include.
   a. Lack of knowledge, lack of wisdom
   b. Stress, illness, fatigue
   c. Housekeeping, equipment failure
   d. Both a and b

88. When gouging, the air stream must be turned on ____________.
   a. Before the machine is turned on
   b. As the arc is struck
   c. After the arc is stuck
   d. Before the arc is struck

89. CAC-A stands for
   a. Carbon arc cutting
   b. Air carbon arc cutting
   c. Carbon arc cutting with acetylene
   d. None of the above

90. The type of safety device used on an oxygen cylinder is a?
   a. Fuse plug
   b. Check valve
   c. Pressure safety disc
   d. Spring loaded plug
91. When manually gouging on steel, the electrode should extend approximately ______ inches?
   a. 8”
   b. 6”
   c. 4”
   d. 2”

92. What type of safety devise is used on an acetylene cylinder?
   a. Spring loaded plug
   b. Fuse plug
   c. Pressure safety disc
   d. Check valve

93. What determines the rate at which acetylene can be drawn from an acetylene manifold?
   a. Temperature of the cylinder
   b. Amount in the cylinder
   c. Number of cylinders
   d. All of the above

94. To prevent the occurrence of flashbacks, ______ should be installed.
   a. Two-way check valve
   b. Flashback arrestors
   c. Flame screen
   d. Three way check valve

95. The hose nut for the oxygen and the acetylene differ, because the acetylene hose nut ______
   a. Has left handed threads
   b. May have ACE stamped on it
   c. Has a groove cut around the nut
   d. All of the above

96. An oxygen cylinder must be able to withstand a(n) ______ pressure of 3300 psi to be qualified for service.
   a. Atmospheric
   b. Hydroscopic
   c. Hydrostatic
   d. air

97. ______ is done when two metals, which do not melt are joined together by a third metal that melts at a temperature above 840 degrees.
   a. Soldering
   b. Oxyfuel welding
   c. Brazing
   d. None of the above
98. What is the best flame adjustment for cutting low carbon steel?
   a. Oxidizing flame
   b. Neutral flame
   c. Carburizing flame
   d. All of the above

99. Which flame setting is the coldest?
   a. Oxidizing flame
   b. Neutral flame
   c. Carburizing flame
   d. All of the above

100. When opening the acetylene cylinder, it should be opened?
     a. $\frac{1}{4}$ to $\frac{1}{2}$ turn
     b. $\frac{1}{2}$ to $\frac{3}{4}$ turn
     c. Both a and b
     d. Turned all the way open

101. Before attaching a regulator to a cylinder, the welder should first
     a. Remove the safety cap
     b. “Crack” the valve
     c. Secure the cylinder
     d. All of the above

102. The welder should make sure the regulators ____________ before opening the cylinders.
     a. Adjustment screws are turned out
     b. Adjustment screws are turned in
     c. Adjustment screws are turned on
     d. None of the above

103. Why should acetylene never be used above 15psi?
     a. Gas is flammable
     b. Acetylene becomes unstable above 15psi
     c. Flashbacks
     d. Acetylene can be used up to 40psi

104. What causes the torch tip to “pop”?
     a. Tip over heats
     b. Tip to close to the metal
     c. Low working pressure
     d. All of the above
105. Where should the welder stand when turning on the cylinder valve?
   a. In front of the regulator
   b. Behind the regulator
   c. To the side of the regulator
   d. Under the regulator

106. The cutting torch should be held so that the inner cones of the preheat flame is
    approximately _____ inches from the metal being cut.
    a. 1/16" – ⅛"
    b. ⅛" – 3/16"
    c. 1/16" – 1/8"
    d. 1/8"- 3/16"

107. Virtually all metals will burn (cut) if they are first heated to their ________
    a. Preheat point
    b. Ignition point
    c. Hot point
    d. Melting point

108. What determines the cutting tip size?
    a. Torch size
    b. Cylinder pressure
    c. Cutting position
    d. Metal thickness

109. What determines the cutting tip size when cutting pipe?
    a. Pipe size and thickness
    b. Pipe being rolled out
    c. Outside temperature
    d. All of the above

110. How is it possible to cut of rivet heads (bolt heads) without cutting into the metal plates?
    a. A straight tip
    b. An angled tip (gouging tip)
    c. # 4 tip
    d. It is not possible

111. To start a cut faster in thick plate, what method is used?
    a. Slant the torch
    b. Use a #00 tip
    c. Use a map gas tip
    d. All of the above
112. The orifice (hole) in the center of the tip is called?
   a. Oxygen jet orifice
   b. Preheat orifice
   c. Acetylene jet orifice
   d. Oxyfuel mixing orifice

113. The orifice (holes) on the outer edge of the torch tip are called?
   a. Oxygen jet orifice
   b. Preheat orifice
   c. Acetylene jet orifice
   d. Oxyfuel mixing orifice

114. Extra tips should be stored in holders made of?
   a. Aluminum
   b. Wood
   c. Both a and b
   d. None of the above

115. To produce a good quality cut the welder should insure?
   a. Acetylene pressure is 15psi or more
   b. Tip is clean
   c. Preheat flames are 1° from the metal
   d. All of the above

116. Cutting tips are constructed using what material?
   a. Steel
   b. Nickle
   c. Aluminum
   d. Copper alloys

117. The fuel gas and oxygen mix in what part of the torch?
   a. In the regulators
   b. At the hose connections
   c. In the mixing chamber
   d. They are pre mixed in the cylinders

118. The letters BTU stand for?
   a. Big thermal units
   b. British thermal ultrasonic
   c. British temperature units
   d. British thermal units

119. Which cutting tip is the smallest?
   a. 000
   b. 00
   c. 0
   d. 1
120. Where are the fuse plugs located on the acetylene cylinder?
   a. Top and bottom of the cylinder
   b. Top of the cylinder
   c. Bottom of the cylinder
   d. Acetylene cylinders use a pressure safety disc

121. Why should acetylene cylinders never be used in the horizontal position?
   a. Gas will come out to fast
   b. Gas will not come out
   c. Acetylene cylinders can be used in horizontal position
   d. Liquid acetone will come out

122. The acetylene fuse plugs melt at what temperature?
   a. 212 degrees
   b. 150 degrees
   c. 450 degrees
   d. Fuse plugs will not melt

123. The regulators perform what two functions?
   a. Reduce and flow
   b. Flow and regulate
   c. Reduce and regulate
   d. It only reduces the pressure

124. What should be done to the cylinders before attaching the regulators?
   a. Wipe cylinder valve with an oily rag
   b. "Crack" the valve
   c. Both a and b
   d. None of the above

125. What should be done if a flashback occurs?
   a. Throw the torch down and run
   b. Keep cutting
   c. Add more fuel and oxygen
   d. Turn off the fuel and oxygen

126. How many and what kind of valves does a combination cutting torch have?
   a. 2 oxygen and 2 fuel valves
   b. 1 oxygen and 3 fuel valves
   c. 3 oxygen and 2 fuel valves
   d. 3 oxygen and 1 fuel valves

127. The ignition temperature of steel occurs when the color is cherry red and its
temperature is approximately?
   a. 900 to 1000 degrees
   b. 1300 to 1400 degrees
   c. 1800 to 2800 degrees
   d. 100 to 1200 degrees
128. What should you use to move a cylinder
   a. Furniture dolly
   b. Cylinder truck
   c. Pick it up and carry it
   d. Lay it down and roll it

129. Oxygen cylinders are made out of what type of material?
   a. Mild steel
   b. Armor plate steel
   c. Aluminum
   d. Cast iron

130. The protective shade lens that should be used when oxyfuel cutting is?
   a. Shade 15
   b. Shade 10
   c. Shade 5
   d. Shade 2

131. What metals list can be cut with an oxyfuel torch?
   a. Aluminum
   b. Carbon steel
   c. Stainless steel
   d. All of the above

132. When pipe is 12" or less in diameter it is size by.
   a. Inside diameter
   b. Outside diameter
   c. Length
   d. Wall thickness

133. When pipe exceeds 12" in diameter it is size by.
   a. Inside diameter
   b. Outside diameter
   c. Length
   d. Wall thickness

134. For every pound of solid wire electrode use when GMAW ________ becomes deposited weld metal.
   a. 90% to 98%
   b. 92% to 98%
   c. 82% to 92%
   d. 60% to 70%
135. For every pound of flux cored arc welding wire used ____________ becomes deposited weld metal.
   a. 90% to 98%
   b. 92% to 98%
   c. 82% to 92%
   d. 60% to 70%

136. For every pound of a SMAW electrode use ____________ becomes deposited weld metal.
   a. 90% to 98%
   b. 92% to 98%
   c. 82% to 92%
   d. 60% to 70%

137. When GMAW which mode transfers the most metal per hour?
   a. Short circuit mode
   b. Globular mode
   c. Spray mode
   d. They are all the same

138. Short circuit mode GMAW can be done in what position(s)?
   a. Flat only
   b. Flat and vertical
   c. Flat, vertical and horizontal
   d. All positions

139. Globular mode GMAW can be welded in what position(s)?
   a. Flat only
   b. Flat and vertical
   c. Flat, vertical and horizontal
   d. All positions

140. Spray mode GMAW can be done in what position(S)?
   a. Flat only
   b. Flat and vertical
   c. Flat, vertical and horizontal
   d. All positions

141. Pulsed Spray mode GMAW can be done in what position(s)?
   a. Flat only
   b. Flat and vertical
   c. Flat, vertical and horizontal
   d. All positions
142. In GMAW welding, when the electrode wire becomes entangled in the drive rolls this is called?
   a. Birds nest
   b. Wire jam
   c. Wire entanglement
   d. All of the above

143. When welding GMAW root pass any wire sticking out on the back side of the root is called?
   a. Wire stick out
   b. Wire protrusion
   c. Wire inclusions
   d. Whiskers

144. In GTAW uses a _________ to hold the tungsten in place
   a. Nozzle
   b. Gas lens
   c. Collet
   d. Clamp

145. Gas metal arc welding is generally used because?
   a. It makes the highest quality welds
   b. It is faster than SMAW and GTAW
   c. It is cheaper than SMAW and GTAW
   d. It can easily be used in the field

146. The GMAW process uses a _________ to direct the shielding gas?
   a. A contact tip
   b. A nozzle
   c. A ceramic cup
   d. A constricting nozzle

147. When a welder pulls the trigger on a GMAW gun what does he turn on?
   a. The shielding gas
   b. The drive rolls
   c. The electrical current
   d. All of the above

148. What gives the electrical current to the wire in GMAW?
   a. The contact tip
   b. The nozzle
   c. The gas flow
   d. None of the above
149. What type of power source is a GMAW machine?
   a. Constant current
   b. Constant voltage
   c. Constant power
   d. Constant wire

150. What is inside the flux cored wire used in FCAW?
   a. Fluxing elements
   b. Deoxidizers
   c. Both a and b
   d. Gas flow

151. What does the welder need to be careful not to do when setting the tension on the drive rolls while using the FCAW process?
   a. Not putting enough tension on the drive rolls
   b. Putting too much tension on the drive rolls
   c. Setting the wire speed too fast
   d. Setting the wire speed to slow

152. GMAW short circuit mode is desirable because?
   a. Low heat input
   b. Can fill large gaps
   c. Work well in the overhead position
   d. All of the above

153. In GMAW globular mode the metal is transferred across the arc how?
   a. In small regular shaped droplets
   b. In large irregular shaped droplets
   c. In a cone shaped spray
   d. None of the above

154. _______ and _______ ray can damage (burn) the eyes or skin of the welder if proper protective equipment is not use.
   a. Infrared rays and X-rays
   b. Ultraviolet rays and radiation rays
   c. Radiation rays and uranium rays
   d. Infrared rays and ultraviolet rays

155. A welder should never have _______ in their pocket.
   a. Matches
   b. Bic lighter
   c. Both a and b
   d. Flint striker
156. A welder should always have on all of these item except?
   a. Safety glasses
   b. Head phone or ear buds
   c. Leather boots
   d. Welding cap

157. The abbreviation PPE stands for?
   a. Proper protective equipment
   b. Proper pipe estimate
   c. Private personal equipment
   d. Proper planning exam

158. What does a weld positioner do?
   a. Position the welding electrode for you
   b. Position the work so the flat position can be obtained
   c. Position the welder so they are safe
   d. Position the welding machine in the shop

159. What does GMAW stand for?
   a. Gas metal arc welding
   b. Gas metallic arc welding
   c. Globular arc welding
   d. None of the above

160. What does SMAW stand for?
   a. Small metal arc welding
   b. Simi arc welding
   c. Shielded arc welding
   d. Shielded metal arc welding

161. What does WPS stand for?
   a. Welding procedure standard
   b. Welding procedure specification
   c. Welding proven specification
   d. None of the above

162. What is a flaw?
   a. A crack exceeding 1"
   b. Lack of fusion
   c. An imperfection
   d. A defect

163. When does a flaw become a defect?
   a. When the flaw is too small and too few
   b. A flaw is undetected on x-ray
   c. When is shows up on an X-ray test
   d. When it becomes too big or too many
164. Which welding process produces a slag coating over the weld?
   a. GTAW
   b. GMAW
   c. SMAW
   d. OFW

165. A hydraulic shear is capable of cutting metal to length of all except?
   a. Flat stock
   b. Bar stock
   c. Angle iron
   d. Pipe

166. Jigs and fixtures are used for everything listed below except?
   a. Speed production
   b. Ensure accuracy of fabrication
   c. Ensure proper welding
   d. Help prevent warpage

167. Oxygen cylinder are painted what color?
   a. White
   b. Green
   c. Blue
   d. Whatever color the manufacturers decide

168. Liquid oxygen is shipped in?
   a. Dewars flask
   b. Regular cylinders
   c. Stainless steel flask
   d. Aluminum flask

169. What is in an acetylene cylinder?
   a. Acetone
   b. Monolithic filler
   c. Acetylene
   d. All of the above

170. A rose bud attachment is used for
   a. Heavy cutting
   b. Stack cutting
   c. Heating
   d. None of the above

171. What should be used to check for leaks?
   a. Non-oil based soap and water solution
   b. Just plain tap water
   c. A light oil so it will bubble
   d. Both b and c
172. What marking indicated that the lenses and frames of eye safety wear meets requirements of ANSI (American National Standards Institute) standards?
   a. Z98.1
   b. Z87.1
   c. Z100
   d. 21CFR

173. Which of the following fuel gas when mixed with oxygen produces the hottest flame?
   a. Mapp gas
   b. Acetylene gas
   c. Natural gas
   d. Propane gas

174. Which metal cutting operation does not produce a kerf?
   a. Oxyfuel
   b. Plasma arc
   c. Shearing
   d. Sawing

175. Which of the following is not considered a mechanical method of cutting?
   a. Plasma arc
   b. Sawing
   c. Shearing
   d. Abrasive wheel

176. Which of the following electrodes is considered a low hydrogen electrode
   a. E-6011
   b. E-6013
   c. E-7014
   d. E-7015

177. Which of the following electrodes are designated to weld flat or horizontal fillet weld only?
   a. E-7018
   b. E-7024
   c. E-6010
   d. E-6013

178. What welding technique/setting list below could cause undercut
   a. Amperage too low
   b. Windy conditions
   c. Long arc length
   d. All of the above
179. What welding technique/setting listed below could cause porosity?
   a. Amperage to low
   b. Windy conditions
   c. Long arc length
   d. All of the above

180. Who is the first person to inspect a weld?
   a. A certified welding inspector
   b. The weld forman
   c. The welder
   d. The instructor

181. If hydrogen is introduced into a weld, it will make the weld ________?
   a. More ductile
   b. More brittle
   c. More convex
   d. More concave

182. What is the approximate temperature of the arc when welding SMAW?
   a. 6500 to 7000
   b. 2800 to 3500
   c. 1300 to 1400
   d. 10000 to 12000

183. In an open V-Groove weld the very first weld pass is called?
   a. Hot pass
   b. Root bead
   c. Filler pass
   d. Cap

184. In an open V-groove weld the weld pass that is welded after the root pass is called the?
   a. Hot pass
   b. Root pass
   c. Filler pass
   d. Cap

185. When welding an open V-groove weld using SMAW process which electrode is commonly use for the root pass?
   a. E-7018
   b. E-7024
   c. E-6010
   d. None of the above

186. Pipe welded in a fixed 45degree angle and not rotated is referring to?
   a. 3G
   b. 4G
   c. 5G
   d. 6G
187. A groove weld that is welded in the horizontal position is called?
   a. 2F
   b. 2G  
   c. 3F
   d. 3G

188. A groove weld that is welded in the vertical position is called?
   a. 2F
   b. 2G
   c. 3F
   d. 3G

189. A groove weld that is welded in the overhead position is called?
   a. 3F
   b. 3G
   c. 4F
   d. 4G

190. A pipe that is welded in the 5G position ________?
   a. Can be rotated
   b. Cannot be rotated
   c. Can be rotated once only
   d. There is no 5G position
The following question will refer to the weld symbol above

191. In the welding symbol what is “A”?
   a. Leader line
   b. Arrow
   c. Reference line
   d. Tail

192. In the welding symbol what is “J”?
   a. Leader line
   b. Arrow
   c. Reference line
   d. Tail

193. In the welding symbol what is “C”?
   a. Weld length weld
   b. Weld depth
   c. Weld size
   d. Thickness of metal

194. In the welding symbol what is “D”?
   a. Fillet weld
   b. Bevel weld
   c. Double bevel weld
   d. none of the above

195. In the welding symbol what is “E”?
   a. Pitch of the weld
   b. Length of the weld
   c. Size of the weld
   d. 3 welds to be made
196. In the welding symbol what is “B”?
   a. Spot weld
   b. Weld in the field
   c. Weld all the way around
   d. Special welding process needed

197. In the welding symbol what is “F”?
   a. Pitch of weld
   b. Length of weld
   c. Size of weld
   d. 9 welds to be made

198. In the welding symbol what is “G”?
   a. Fillet weld
   b. Bevel weld
   c. Double Bevel weld
   d. V-Groove weld

199. In the welding symbol what is “H”?
   a. 1/16” weld size
   b. 1/16” size of bevel
   c. 1/16” root opening
   d. 1/16” size of filler rod

200. In the welding symbol what is “I”?
   a. Electrode angle to be used
   b. Bevel angle
   c. Angle weld is to be welded in
   d. Travel angle

201. In the welding symbol what is “J”?
   a. Tail
   b. Double arrow
   c. Indicates V-groove welding
   d. None of the above