Welder
Practice Interprovincial Red Seal Exam

Disclaimer: This is NOT an Interprovincial Standards (Red Seal) Examination. This is a practice examination that has been developed using similar weighting, question distribution, question taxonomies and question styles to that of a red seal examination. Success on this examination will NOT result in certification or qualification. This examination is intended to be used for self assessment in preparation for attempting a red seal examination. More information about the standard that the red seal examination is based may be found within the National Occupational Analysis for the occupation at www.red-seal.ca.

Section 1   Occupational Skills

1. ______ What does 3F designate on a welding specification sheet?
   a. Flat fillet weld position.
   b. Horizontal fillet weld position.
   c. Vertical fillet weld position.
   d. Overhead weld position.

2. ______ With the scale of a drawing at 1:5, what is the length of line on the drawing for a plate length of 150cm (59”)?
   a. 5 cm (2”).
   b. 15 cm (6”).
   c. 30 cm (12”).
   d. 75 cm (30”).

3. ______ How many millimeters is equivalent in length to 6 feet – 3 1/2 inches?
   (25.4mm = 1”)
   a. 1300mm.
   b. 1613mm.
   c. 1918mm.
   d. 1969mm.

4. ______ Which type of drawing would show all three sides equally and uses horizontal plane lines at 30 degrees?
   a. Oblique.
   b. Isometric.
   c. Perspective.
   d. Orthographic.
5. ______ Which metal is more likely to crack due to weld joint shrinkage?
a. Stainless steel
b. Copper
c. Cast iron
d. Carbon steel

6. ______ What type of material has a grain structure that appears very coarse and silvery?
a. Aluminum.
b. Stainless steel.
c. Grey cast iron.
d. White cast iron.

7. ______ What is the best way to determine the composition of a metal so that it can be welded?
a. Check the Blue-Print.
b. Check the mill test report.
c. Ask a co-worker.
d. Complete a spark test.

8. ______ Which component of a welding machine changes AC current to DC current?
a. Rectifier.
b. Resistor.
c. Conductor.
d. Capacitor.

9. ______ What would the abbreviation RFSO mean on a material list?
a. Reinforced fitting socket weld on.
b. Raised face slip on.
c. Reinforced fitting slide on.
d. Roll weld fitting slowly.

10. ______ Which standard refers to welded steel construction using metal arc welding?
a. CSA Z662.
b. CSA W178.2.
c. CSA W59.
d. CSA W47.1.

11. ______ When ultraviolet rays from the welding arc come into contact with chlorinated hydrocarbon degreasers, what poisonous gas is created?
a. Ethylene dichloride gas.
b. Ozone.
c. Phosphine gas.
d. Phosgene gas.
12. _____ When welding where the general public may be exposed to the rays of the arc, what should the welder do?
   a. Proper screens and warning signs.
   b. Rope off the area.
   c. Inform the safety coordinator.
   d. Give a verbal warning before starting to weld.

13. _____ What would be the best type of material to use for making a permanent template for pipe?
   a. Newsprint paper.
   b. Heavy cardboard.
   c. Fiber gasket.
   d. Sheet steel.

14. _____ What tool would you use to scribe large arcs and circles?
   a. Trammel points.
   b. Compass.
   c. Divider.
   d. Chalk line.

15. _____ What tool would give you the most accurate measurement to determine the wall thickness of pipe?
   a. Tape measure.
   b. Dividers.
   c. Calipers.
   d. Trammel points.

16. _____ Which fuel gas would provide the greatest amount of heat energy for pre-heating?
   a. Propane.
   b. Propylene.
   c. Natural Gas.
   d. Acetylene.

17. _____ What would excessive drag lines indicate when oxy-fuel cutting?
   a. The cutting tip size is too large.
   b. The oxygen pressure is too high.
   c. Travel speed is too slow.
   d. Travel speed is too fast.

18. _____ Which disc would be selected when using a 5” grinder that has a 10,000 r.p.m. rating and grinding on the flat side of the disc?
   a. Disc thickness $\frac{3}{32}''$, rated at 12,200 r.p.m.
   b. Disc thickness $\frac{1}{4}''$, rated at 8600 r.p.m.
   c. Disc thickness $\frac{1}{16}''$, rated at 10 000 r.p.m.
   d. Disc thickness $\frac{1}{4}''$, rated at 12 200 r.p.m.
19. _____ Which drawing shows all dimensions and the completed object?
   a. Detail.
   b. Working.
   c. Assembly.
   d. Reference.

20. _____ What would be the radius of a 6” (15cm) long radius 90 degree elbow?
   a. 6 inches (15cm).
   b. 9 inches (23cm).
   c. 12 inches (30cm).
   d. 15 inches (38cm).

21. _____ A cylindrical tank with a 12 foot (365.75cm) O.D. is to have a nozzle installed at 45 degrees around the circumference. From the 0º reference point what would be the linear measurement to locate the nozzle? (Answer to the nearest 16th (0.15 cm) of an inch.)
<table>
<thead>
<tr>
<th>Imperial</th>
<th>Metric</th>
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<tbody>
<tr>
<td>a. 4'-1/8”.</td>
<td>a. 122.237 cm</td>
</tr>
<tr>
<td>b. 4’-8 9/16”.</td>
<td>b 143.667 cm</td>
</tr>
<tr>
<td>c. 6’-9 7/16”.</td>
<td>c. 206.849 cm</td>
</tr>
<tr>
<td>d. 14’-1 10/16”.</td>
<td>d 430.847 cm</td>
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22. _____ What direction does metal expand when pre-heated without being restrained?
   a. Volumetrically (in all directions).
   b. Longitudinally (lengthwise).
   c. Transversely (across its width).
   d. Only upwards and downwards.

23. _____ When fitting and assembling, how long should tack welds normally be?
   a. One half the thickness of the base metal.
   b. Same length as the thickness of the base metal.
   c. Twice the length as the thickness of base metal.
   d. Always make your tacks as long as possible.

24. _____ When preparing test coupons for an ASME section IX welder qualification, what is the maximum that the edges of each coupon may be radiused?
   a. 3/32” (2.5mm).
   b. 1/32” (0.8mm).
   c. 1/16” (1.6mm).
   d. 1/8” (3.2mm).
25. ______ How would you check for leaks on oxy-fuel equipment?
   a. With a flame from a lighter.
   b. With a leak detection fluid.
   c. By increasing the pressure to hear it.
   d. By using anti-leak solution.

26. ______ What is the rigging signal used to lift a load vertically?
   a. Thumb pointed upwards with a circular turning motion.
   b. Right arm extended vertically with a circular turning motion.
   c. Thumb pointed upwards with an up and down jerking motion.
   d. Finger pointed upwards with a circular turning motion.

27. ______ What is the maximum number of plates that can be lifted using a plate clamp with a locking grip?
   a. One.
   b. Two.
   c. Three.
   d. As many as will fit between the jaws.

Section 2 Quality Control

28. ______ Who is responsible for the administration and certification to CSA W 47.1?
   a. Minister of Labor.
   b. Any Building Department.
   c. Any company who is certified.
   d. Canadian Welding Bureau.

29. ______ What code or standard covers the construction of pressure vessels?
   a. CSA W59.
   b. CSA W47.2.
   c. ASME Section VIII.
   d. CSA Z662.

30. ______ What is the main reason for using pre-heat on heavy sections prior to welding?
   a. To reduce the current setting.
   b. To eliminate the need for cleaning.
   c. To reduce the quenching effect and remove hydrogen.
   d. To aid in the formation of the weld bead.

31. ______ Annealing is a heat treatment process which leaves the material in what state?
   a. Softest, toughest, weakest state.
   b. Hardest, toughest, strongest state.
   c. Softest, toughest, strongest state.
   d. Hardest, weakest, toughest state.
32. _____ What is the controlled heating (1100 to 1150º F) (539 to 621º C) of a welded steel fabrication, then slow controlled cooling process?
   a. Annealing
   b. Normalizing
   c. Tempering
   d. Stress relieving

33. _____ In ASME what is used to identify weld metal chemical composition?
   a. A – numbers.
   b. B – numbers.
   c. F – numbers.
   d. P – numbers.

34. _____ What is the most precise method of identifying properties of a metal?
   a. By performing a series of identification tests.
   b. By performing a chemical analysis on a piece of scrap.
   c. By visual identification of color coding.
   d. By reviewing the appropriate Mill Test Report.

35. _____ What would be the approximate temperature range of a rod oven for proper storage of low hydrogen electrodes?
   a. 30°C – 140°C (85°F – 250°F) above the ambient temperature.
   b. 30°C – 140°C (85°F – 250°F) below the ambient temperature.
   c. 260°C – 427°C (500°F – 800°F) above the ambient temperature.
   d. 260°C – 427°C (500°F – 800°F) for one to two hours.

36. _____ Using the CSA classification system in the E492T – 6CH, what does the 2 denote?
   a. Tensile strength of weld metal.
   b. Welding limited to the flat and horizontal position.
   c. Chemical composition of weld metal.
   d. Type of shielding gas required.

37. _____ What is the most common type of non-destructive testing?
   a. Hydrostatic.
   b. Magnetic particle.
   c. Ultrasonic.
   d. Visual inspection.

38. _____ When performing a tensile test, what occurs between the yield point and the ultimate tensile strength?
   a. Fracture.
   b. Solid deformation.
   c. Maximum ductility is reached.
   d. Elastic/plastic range is reached.
39. _____ What is the most accurate tool used to measure the leg length of a fillet weld?
   a. A carpenter square.
   b. A fillet weld gauge.
   c. A tape measure.
   d. A combination square.

40. _____ How is the size of a fillet weld measured?
   a. By the length of the longest leg.
   b. By the length of the shortest leg.
   c. By the length of the effective throat.
   d. By the length of the shortest leg plus penetration.

41. _____ Where would you most likely find the acceptable amount of angular distortion allowable tolerance?
   a. Bill of materials.
   b. Revisions list.
   c. Table of dimensions.
   d. Notes and specifications.

Section 3   Cutting Processes

42. _____ Which tool would be the best choice for cutting 22 gauge steel roof decking?
   b. Cut-off saw.
   c. Grinder.
   d. Tin snips.

43. _____ What determines the material thickness when punching holes with an ironworker?
   a. Only punch material thinner than \( \frac{1}{2} \) the punch diameter.
   b. Only punch material thinner than \( \frac{3}{4} \) the punch diameter.
   c. Only punch material thickness larger than the punch diameter.
   d. Only punch material thicknesses equal to or less than the punch diameter.

44. _____ According to OH&S regulations, what is the minimum number of degrees that the guard must cover the grinding disc?
   a. 90°.
   b. 105°.
   c. 120°.
   d. 135°.
45. _____ What is done to restore a grinding wheel that has become glazed or loaded with foreign particles?
   a. Truing.
   b. Squaring.
   c. Blotting.
   d. Dressing.

46. _____ What is the most common ratio of soluble oil to water used for coolant/lubricant on a horizontal band saw?
   a. 1:25.
   b. 25:1.
   c. 1:10.
   d. 10:1.

47. _____ What tip size should be used to cut sheet metal?
   a. #0
   b. #1
   c. #2
   d. #6

48. _____ Why should oxy-acetylene welding or cutting never be done with the acetylene cylinder lying down?
   a. Acetylene will not flow through freely.
   b. Oxygen and acetylene will not mix evenly.
   c. Acetylene will be trapped in the regulator.
   d. Acetone will flow from the acetylene cylinder.

49. _____ What fuel gas would be the best choice for pre-heating 6” (150mm) or thicker material?
   a. Acetylene.
   b. Mapp gas.
   c. Natural gas.
   d. Propane.

50. _____ What is used to determine the amount of heat released by a welding tip?
   a. Distance from the work.
   b. The amount of oxygen pressure.
   c. The amount of acetylene pressure.
   d. The size of tip orifice.
51. Referring to the diagram below which cutting tip is used for removal of rivets and bolts?

A   B   C   D

a. A.  
b. B.  
c. C.  
d. D.  

52. When using the oxy-fuel cutting process, what is required when cutting thinner materials?
   a. Less torch inclination.  
   b. Slower travel speed.  
   c. More torch inclination.  
   d. Higher gas volume.  

53. What is the explosive mixture range of acetylene gas in air?
   a. 2.5% - 80%.  
   b. 3.5% - 95%.  
   c. 3.0% - 93%.  
   d. 2.0% - 98%.  

54. Which of the following is a working part of a regulator?
   a. Mixing chamber.  
   b. Diaphragm.  
   c. Diffuser.  
   d. Gauge glass.  

55. What would offer the least protection from hot sparks and slag when cutting with an oxy-fuel torch?
   a. Leather.  
   b. Wool.  
   c. Polyester.  
   d. Cotton.
56. ____ What characteristics would represent a flashback?
   a. Welding tip continuously overheats.
   b. Black smoke and red sparks are emitted from the tip.
   c. An acetylene hose has ignited and is burning.
   d. Flame constantly extinguishes and re-ignites.

57. ____ What is the temperature range produced within the plasma arc stream?
   a. 1000°F – 5500°F (538 - 3038°C).
   b. 7000°F – 17,500°F (3870 – 9700°C).
   c. 18,000°F – 50,000°F (10,000 – 27,760°C).
   d. 50,000°F – 75,000°F (27,760 – 41,650°C).

58. ____ What two types of shielding gases are used with a plasma dual flow PAC torch system?
   a. Helium and Argon.
   b. Carbon Dioxide and Nitrogen.
   c. Oxygen and Acetylene.
   d. Ozone and Benzene.

59. ____ What dictates travel speed when using PAC equipment?
   a. Condition of the constricting nozzle.
   b. Skill of the operator.
   c. Condition of the electrode.
   d. Type and thickness of the material.

60. ____ What is the best method to control arc radiation, vapors and fumes while using PAC?
   a. Operate PAC systems outdoors only.
   b. Use smaller diameter electrodes and nozzles.
   c. Enclose the operating areas completely and add local exhaust fans.
   d. Use a water table and complete the cut under water.
61. _____ What are two methods of starting the arc when cutting with the PAC?
   a. Push and across start.
   b. Edge and pierce start.
   c. Still and traveling start.
   d. Chisel and nick start.

62. _____ What are the equipment requirements required for CAC-A?
   a. Welding power source, wire feeder, carbon electrodes and shielding gas.
   b. Source of compressed air, carbon electrodes, electrode holders and welding power source.
   c. Granular flux, power generator, electrode holder and copper coated electrodes.
   d. Copper coated electrodes, welding power source, compressed oxygen and electrode holder.

63. _____ When using the CAC-A process, what is the result of inadequate air pressure?
   a. Sputtering arc.
   b. Sticking electrode.
   c. Carbon deposits in the base metal.
   d. Excessive electrode melt off rate.

64. _____ Which electrode can be used for shielded metal arc cutting (electric arc cutting)?
   a. E 6010 (E4310).
   b. E 7018 (E4918).
   c. E 7024 (E4924).
   d. E 8018 (E5518).

Section 4  Gouging Processes

65. _____ Which one of the following power source and polarity combinations is used for manual medium to light duty CAC-A gouging operations?
   a. DC, CV power source set up using DCRP provided it has sufficient output amperage and duty cycle rating.
   b. AC/DC, CC/CV power source set up on CV using DCRP provided it has sufficient amperage output and duty cycle rating.
   c. AC/DC, CC power source set up using DCRP, provided it has sufficient amperage output and 100% duty cycle.
   d. An AC/CV power source provided it has sufficient output amperage and at least a 60%duty cycle rating.
66. _____ What is the main purpose of the copper coating found on CAC-A electrodes?
   a. To improve arc stability through a wider range of amperage settings.
   b. To add to the resistance of the electrode.
   c. To reduce the vaporization rate of the electrode.
   d. To add extra arc force and penetration characteristics to the electrode.

67. _____ What are the three main types of CAC-A electrodes?
   a. AC, DC and plain electrodes.
   b. DC plain, DC copper coated and AC copper coated electrodes.
   c. Graphite based, copper based and carbon based.
   d. AC/DC plain, DC copper coated and AC/DC graphite based electrodes.

68. _____ Which of the following set of parameters provides the best selection for air pressure and amperage settings for use with \( \frac{1}{4} \)“ (6.4mm) diameter CAC-A electrodes?
   a. 90-150 amps @ 35-80 psi (241 – 551 KPa) air pressure.
   b. 200-400 amps @ 80-100 psi (551 – 689 KPa) air pressure.
   c. 225-500 amps @ 100-120 psi (689 – 827 KPa) air pressure.
   d. 600+ amps @ 100-140 psi (689 – 965 KPa) air pressure.

69. _____ What could be done to achieve more than 1000 amps where required automatic and semi-automatic CAC-A gouging operations?
   a. A machine capable of the desired output and duty cycle must be obtained.
   b. The work piece may be submerged underwater using a special water table to optimize current flow and conductivity, resulting in more work with less amperage.
   c. Two or more standard welding machines may be connected in parallel to obtain the needed amperage output.
   d. Standard welding machinery can have the factory preset amperage output capacity altered by a qualified electrician to provide the required amperage.

70. _____ What is the maximum electrode extension when performing manual CAC-A gouging operations on carbon steel base materials?
   a. 8” electrode extension.
   b. 7” electrode extension.
   c. 6” electrode extension
   d. 4” electrode extension.
71. _____ Which one of the following is the most likely cause of excessive carbon build up on the base metal when performing gouging operations using manual CAC-A on mild steel?
   a. Travel speed too slow.
   b. Improper air jet position or flow, travel speed too fast.
   c. Wrong polarity or electrode.
   d. Too much air pressure and or amperage.

72. _____ Which of the following problems is most likely caused from inadequate air supply in CAC-A system?
   a. Loss of arc continuity resulting in controllability issues.
   b. Excessive electrode consumption.
   c. Hydrogen induced cracking in the base metal.
   d. Excessive carbon deposits and contaminated base metal.

73. _____ How much open circuit voltage is present for use with the PAC gouging process?
   a. 15-35 volts.
   b. 35-120 volts.
   c. 120-400 volts.
   d. 400-500 volts.

74. _____ What type of PAC torch is most commonly used in industry?
   a. Dual gas flow PAC torches.
   b. Water injection PAC torches.
   c. Water table PAC torches.
   d. Air gas PAC torches.

75. _____ What current and polarity is used in plasma Arc cutting and gouging operations?
   a. DCRP.
   b. AC.
   c. DCSP.
   d. DCCV.
76. ____ What is done to a PAC cutting torch to make it suitable for gouging operations?
   a. No changes are made to the PAC torch set up, operator technique is the only change needed.
   b. Higher than normal air pressure and voltage settings are employed for optimum results.
   c. A water cooling system may be added to avoid heat damage to the torch body as associated with excessive heat radiations form the PAC gouging process.
   d. The torch is changed to use a nozzle that reduces arc constriction resulting in lower arc stream velocity.

77. ____ How may noise, fume and radiation levels be reduced when using the PAC process for gouging or cutting operations?
   a. Clean the material thoroughly with a degreasing solution, wear proper eye and hearing protection.
   b. Follow the manufacturers’ recommendations regarding suggested power settings and travel speeds.
   c. Cutting and gouging may be done underwater on a specially designed water table.
   d. Do not use excessive amperage settings.

Section 5  Welding Processes

78. ____ How many different types of welding tips are there for oxy-fuel welding/brazing?
   a. One.
   b. Two.
   c. Three.
   d. Four.

79. ____ What is the function of flux when using OAW?
   a. Dissolve or dislodge existing oxides and float them to the surface of the weld bead.
   b. Exclude oxygen and nitrogen from the weld until it cools to the point that oxides and nitrides no longer form.
   c. Shapes the weld bead.
   d. Slows the rate of cooling.

80. ____ A dark, hazy leading edge on the puddle along with a bubbling action in the puddle is characteristics of what type of oxy-fuel flame?
   a. Neutral flame.
   b. Oxidizing flame.
   c. Carbonizing flame.
   d. These characteristics are not associated with oxy-fuel welding.
81. ______ Which type of welding machine will have a significant energy savings?
   a. AC Transformer.
   b. Transformer Rectifier.
   c. AC Generator.
   d. Inverter.

82. ______ Using a Transformer Rectifier with 400 amps maximum output and 90% duty cycle, what is the maximum amperage that can be used for welding continually?
   a. 250 amps.
   b. 300 amps.
   c. 360 amps.
   d. 380 amps.

83. ______ What size of whip would be used if the cable from the welding machine is a #1?
   a. 3/0.
   b. 2/0.
   c. 1/0.
   d. 3.

84. ______ Which of the following would indicate characteristics for a group of electrodes under ASME?
   b. 4F.
   c. P4.
   d. A4.

85. ______ With an E7024 (E4924) electrode, what number indicates welding position?
   a. 0.
   b. 2.
   c. 4.
   d. 7.

86. ______ Which electrode would you use to increase productivity?
   a. E6010 (E4310).
   b. E7014 (E4914).
   c. E7018 (E4918).
   d. E7024 (E4924).
87. _____ What is the recommended amperage range for an E7018, \( \frac{3}{32} \)" (E4918, 2.5mm) electrode?
   a. 50-65 amps.
   b. 70-100 amps.
   c. 105-125 amps.
   d. 130-150 amps.

88. _____ Which of the following are characteristics of a short arc length?
   a. Increased voltage, decreased amperage and decreased weld deposit.
   b. Decreased voltage, increased amperage and increased weld deposit.
   c. Increased voltage, decreased amperage and increased weld deposit.
   d. Decreased voltage, increased amperage and decreased weld deposit.

89. _____ Which electrode can be used as a polarity checking electrode?
   a. E7010 (E4910).
   b. E7014 (E4914).
   c. E7018 (E4918).
   d. E7024 (E4924).

90. _____ For most applications, what is the correct width of a weave bead?
   a. 1-1\( \frac{1}{2} \) times the bare electrode diameter.
   b. 2-3 times the bare electrode diameter.
   c. 3\( \frac{1}{2} \)-4 times the bare electrode diameter.
   d. 4\( \frac{1}{2} \)-5 times the bare electrode diameter.

91. _____ What is the cause of a narrow, high bead while SMAW?
   a. Too long an arc length.
   b. Too short an arc length.
   c. Excessive current.
   d. Excessive travel speed.

92. _____ What will changing the electrode inclination do to the weld bead?
   a. Cause the ripples to form unevenly.
   b. Cause the weld to build up at the edges.
   c. Have an effect on the depth of penetration.
   d. Have no effect on the weld.

93. _____ What is the most commonly used drive roll profile for FCAW?
   a. U-groove drive roll system.
   b. V-groove drive roll system.
   c. Angled drive roll system.
   d. Knurled drive roll system.
94. Why would you inspect your contact tip frequently?
   a. To be sure the tip has not melted due to increased heat output.
   b. To check for wear or blockage that may cause poor electrical contact and an erratic arc.
   c. To see if it has enough mig dip coating the tip.
   d. To be sure it is still tight to the diffuser.

95. What type of liner is used for the FCAW process?
   a. Plastic.
   b. Teflon.
   c. Nylon.
   d. Stainless steel.

96. What are the four types of FCAW electrodes?
   a. Cellulose core, basic core, iron powder core & self shielded.
   b. Rutile core, basic core, metal core and self shielded.
   c. Cellulose core, basic core, metal core and self shielded.
   d. Cellulose core, rutile core, low hydrogen core and iron powder core.

97. In the AWS electrode specification E-70T-3, what welding position is indicated?
   a. All positions.
   b. Flat and horizontal positions.
   c. Vertical position.
   d. Position is not specified.

98. What will increasing amperage produce while FCAW?
   a. Narrow, higher bead with less metal flow and deeper penetration.
   b. Narrow, higher bead with more metal flow and deeper penetration.
   c. Wider, flatter bead with less metal flow and deeper penetration.
   d. Wider, flatter bead with more metal flow and deeper penetration.

99. What would the duty cycle of the power source be when using the FCAW process in the fully automatic mode?
   a. 65%
   b. 75%
   c. 80%
   d. 100%

100. Which type of GMAW wire drive system has the maximum cable length of 15 feet (4 572mm)?
    a. Push type.
    b. Pull type.
    c. Push/pull type.
    d. Pull/pull type.
101. _____ When welding mild steel with the GMAW process, what shielding gas gives you the deepest penetration?
   a. Argon.
   b. Helium.
   c. Argon/CO₂ mixture.
   d. CO₂.

102. _____ What is used to determine the type of filler wire used for FCAW?
   a. The type of base metal.
   b. The type of power source.
   c. The size of gun.
   d. The thickness of the base metal.

103. _____ Which metal transfer with GMAW produces the least amount of spatter?
   a. Short circuiting transfer.
   b. Globular transfer.
   c. Spray transfer.
   d. Transition transfer.

104. _____ What range of amperage is best suited to achieve spray transfer with .035” (.889mm) diameter wire?
   a. 100-125 amps.
   b. 130-160 amps.
   c. 180-230 amps.
   d. 250-300 amps.

105. _____ What is the first step when changing out an empty spool of wire?
   a. Remove nozzle and contact tip.
   b. Pull wire out of liner.
   c. Remove the empty spool.
   d. Turn off power source and wire feeder.

106. _____ Who should install your brand new GMAW machine?
   a. The supplier.
   b. The supervisor.
   c. A qualified electrician
   d. The employer.

107. _____ If the wire is feeding erratically, what is the most likely problem?
   a. Dirty tip.
   b. Too much tension on drive roll.
   c. Dirty liner.
   d. Worn out drive rolls.
108. _____ What is the most common cause of undercut on the cap pass of a 3F weld?
   a. Travel speed too slow.
   b. Amperage too high.
   c. Wire stick out too long.
   d. Contact tip to work distance is excessive.

109. _____ Which welding process is used to produce high quality welds on critical weldments?
   a. SMAW.
   b. GMAW.
   c. FCAW.
   d. GTAW.

110. _____ When using the GTAW process what shielding gas gives deeper penetration, faster welding speeds and a narrow heat affected zone?
   a. Argon.
   b. Helium.
   c. Hydrogen.
   d. Argon/CO\textsubscript{2} mixture.

111. _____ What is the color band of EWTh-1?
   a. Green.
   b. Yellow.
   c. Red.
   d. Brown.

112. _____ At what point during the AC cycle does the cleaning action occur?
   a. Positive half cycle.
   b. Negative half cycle.
   c. The very start.
   d. The very end.

113. _____ What is the cause of root suck back?
   a. Arc length too long and excessive pre-heat.
   b. Arc length too short and incorrect fit-up.
   c. Improper position of filler metal addition, current too low and travel speed too fast.
   d. Improper position of filler metal addition, current too high and travel speed too slow.

114. _____ When using GTAW on aluminum, what is the cause of a convex fillet weld?
   a. Adding too much filler metal, travel speed too fast, current too low.
   b. Adding too much filler metal, travel speed too slow, current too low.
   c. Adding too much filler metal, travel speed too fast, current too high.
   d. Adding too much filler metal, travel speed too slow, current too high.
115. ____ Which of the following is an advantage of pulsed GTAW?
   a. Decreased depth to width ratio.
   b. Wider heat affected zone.
   c. Reduction in porosity and incomplete fusion.
   d. Increased burn through.

116. ____ What does the up slope/down slope option do for GTAW?
   a. Adjusts the current through use of a foot pedal.
   b. Gives a short burst of amperage at the arc initiation then reduces current prior to arc shut off.
   c. Controls the time response from arc initiation to full welding current.
   d. Adjusts the amount of time shielding gas flows prior to arc initiation and after the arc has shut off.

117. ____ What is the recommended power source to use with SAW with small diameter electrodes $\frac{5}{64} - \frac{1}{8}$” (2.0 – 3.2mm)?
   a. CC coupled with a voltage sensing wire feeder.
   b. CV coupled with a constant speed wire feeder.
   c. CC coupled with a constant speed wire feeder.
   d. CV coupled with a voltage sensing wire feeder.

118. ____ Which type of flux can be re-used in SAW?
   a. Bonded.
   b. Agglomerated.
   c. Fused.
   d. Rutile based.

119. ____ What would be the proper stick out of a $\frac{1}{16}$” (1.6mm) diameter wire?
   a. $\frac{7}{16}$” (11mm).
   b. $\frac{1}{2}$” (13mm).
   c. $\frac{9}{16}$” (14mm).
   d. $\frac{5}{8}$” (16mm).

120. ____ Which of the following would have the most effect when using SAW?
   a. Voltage.
   b. Amperage.
   c. Travel speed.
   d. Type of flux used.

121. ____ What variations of welding does Stud Arc Welding use?
   a. Arc welding and forge welding.
   b. Arc welding and electroslag welding.
   c. Arc welding and electrogas welding.
   d. Arc welding and plasma arc welding.
122. ____ What would be the current type and polarity used for welding studs onto steel?
   a. DCEP.
   b. DCEN.
   c. AC/DC.
   d. ACHF.

123. ____ In what industry is spot welding most common?
   a. Oil and gas.
   b. Automotive.
   c. Agriculture.
   d. Forestry.

124. ____ When Resistance Spot Welding, if exerted pressure between contact tips is increased, what must happen to the welding current?
   a. Welding current decreases.
   b. Welding current increases
   c. Welding current remains unchanged.
   d. Welding current is unaffected by the exerted pressure.

125. ____ What is the advantage of spot welding on light gauge material?
   a. It can be adapted to any arc welding power source.
   b. It increases production speed and lowers distortion.
   c. It does not require a shielding gas.
   d. It gives deeper penetration.