

Name:

Student Number:

Date:

Select one answer except for questions which say (Select all that apply), which may have multiple correct answers.

1. Which PPE is ALWAYS required when welding? (Select all that apply)
 - a. Auto-Darkening Welding Mask
 - b. Fire resistant gloves
 - c. Hearing protection
 - d. Safety glasses
 - e. Spatter-resistant shoes
 - f. Clothing covering all exposed skin
 - g. Nomex balaclava
2. What must be done before welding is started? (Select all that apply)
 - a. Ensure the immediate area is free of anything flammable like garbage cans or flammable liquid containers
 - b. Alert other shop users that you will be welding
 - c. If you are unsure of anything or do not yet have much experience, ask a shop supervisor to check your setup
 - d. Ensure that the ground and torch cables will not be damaged by the hot workpiece when welding
3. Which statements are correct concerning compressed gas cylinder storage?
 - a. Cylinders must be restrained to prevent falling over
 - b. A cylinder cap must be installed when not in use
 - c. Cylinder valves must be closed when not in use
 - d. Cylinders can be transported with the regulator attached
 - e. Welding gases themselves are hazardous and special precautions must be taken to avoid breathing them during regular use
4. What is the primary purpose of the welding curtain? (Select the most important option)
 - a. Contain sound created by welding
 - b. Contain fumes created by welding
 - c. Contain light created by welding
5. What is the difference between welding and soldering/brazing?
 - a. Welding only works for metals with a high melting point
 - b. Soldering and brazing only work for metals with a low melting point
 - c. Welding partially melts the base metal where soldering/brazing do not
 - d. In soldering/brazing the filler metal must be a similar alloy to the base metal

6. Which of the following processes create fumes which require breathing protection if the fume extractor arm and room ventilation can not be used? (Select all that apply)
- a. MIG welding regular carbon steel
 - b. Flux Cored welding regular carbon steel
 - c. TIG welding stainless steel
 - d. Stick welding regular carbon steel
7. Which statement is correct?
- a. Ideally the welding torch or gun is braced against the workpiece or the table using your hands
 - b. You should try not to stop and re-start the welding bead, even if it means you must weld in a difficult position
 - c. It is not required to plan and move your hands through the motion of the weld before welding-just start at one side and move along the joint
8. Once welding is complete, which actions are appropriate? (Select all appropriate actions)
- a. Leave the workpiece behind the welding curtain while it cools off
 - b. If the workpiece is not behind the welding curtain, let others working in the area know it is hot
 - c. Use welding gloves and pliers to bring the workpiece to the sink and cool it off with water
 - d. Place the workpiece next to the window so it cools down faster
9. If you notice a small fire in the IGEN shop, what should you do? (Select all that apply)
- a. Use the fire blanket to choke the fire
 - b. Alert other shop users
 - c. Immediately use a fire extinguisher, regardless of the size of the fire
 - d. If the fire is very small (<1" x 1", 2.5cm x 2.5cm), place a large fireproof item on top of it to smother it.
 - e. Determine the cause of the fire. If there is any procedural change that could prevent it in the future, alert a Shop Supervisor.
10. Why must the weld puddle always be shielded by either an inert gas (MIG or TIG welding) or solid flux which burns as you weld to produce shielding gases (Flux cored or Stick welding)?
- a. To reduce spatter
 - b. To establish the arc
 - c. To prevent oxidation and porosity which would be caused by oxygen in the air
 - d. To reduce the brightness of the arc

MIG/Flux Core Welding

11. Which welding process requires shielding gas?
 - a. MIG
 - b. TIG
 - c. Flux Cored
 - d. Stick Welding

12. Which welding process always requires the use of the fume extraction arm and room ventilation or a respirator?
 - a. MIG
 - b. TIG
 - c. Flux Cored
 - d. Stick Welding

13. Which material usually requires a separate spool gun to feed filler wire at a high speed?
 - a. Aluminum
 - b. Steel
 - c. Titanium

14. What must be switched when changing from steel MIG to flux cored welding? (Select all that apply)
 - a. The filler wire (Roll up and remove the current one and thread in the new roll)
 - b. The polarity (welding gun is positive and workpiece is negative for flux cored)
 - c. Ensure that the shielding gas tank is closed (tank valve turned all the way to the right)
 - d. Install the spool gun and remove the regular welding gun

15. Which of the following statements are correct? (Select all that apply)
 - a. MIG welding is generally slower than TIG welding, so if a welding job is very large TIG is a more appropriate process
 - b. Flux cored welding is somewhat tolerant of dirty metals
 - c. MIG welding is more appropriate for sheet metal than stick welding
 - d. TIG welding is a better choice for welding outdoors than stick welding

16. Which process creates more spatter?
 - a. MIG welding
 - b. TIG welding
 - c. Flux core welding

Stick Welding

9. What PPE is required when stick welding? (Select all that apply)
 - a. Thick insulated welding gloves
 - b. A P100 respirator
 - c. Spatter proof shoes
 - d. Fire resistant sleeves or other adequate arm protection
10. On what base metal does stick welding outperform all other processes?
 - a. Thin aluminum sheet metal
 - b. Thick, dirty mild steel
 - c. Stainless steel
 - d. Exotic alloys like nickel and titanium
11. Why does stick welding penetrate thick metal better than MIG and TIG welding for a given amperage setting?
 - a. The long electrode allows for more amperage to pass through
 - b. The flux on the outside of the rod melts and vaporizes and forms an insulating layer over the weld, retaining heat in the weld puddle and metal workpiece
 - c. A stick welding machine is usually larger than a TIG or MIG machine and can dissipate more wasted heat
12. High strength, low-hydrogen welding electrodes like 7018 will potentially produce poor quality welds if contaminated by _____ during storage
 - a. High temperatures
 - b. Moisture
 - c. Light
 - d. Dust
13. To keep high strength, low hydrogen electrodes like 7018 from being contaminated, the industry standard is to store them in a:
 - a. Freezer
 - b. Airtight container or rod oven set to 120°C
 - c. Dark place
 - d. Clean place
14. Other common rods like 6011 also require specialized storage
 - a. True
 - b. False

TIG Welding

9. What should NOT be done while TIG welding? (Select all that apply)
 - a. Pull the torch away from the workpiece while the foot pedal is still depressed
 - b. Touch the tip of the tungsten into the weld puddle
 - c. Wear thin welding gloves that allow for precise movement
 - d. Hold the torch in your non-dominant hand
10. What should ALWAYS be done while TIG welding? (Select all that apply)
 - a. Wear a respirator if welding high alloy steel such as stainless steel
 - b. Ensure that the welding mask is set to high arc sensitivity because sometimes low-amperage TIG welding will not darken an auto-darkening mask
 - c. Wear the thickest welding gloves available to ensure good hand protection
 - d. Ensure that hands are braced as much as possible to avoid unsteadiness, as long as they are not touching a very hot surface
11. What base metal property does TIG welding require more so than any other process?
 - a. Must be clean
 - b. Must be pre-heated to as high a temperature as possible
 - c. Must be as low-alloy as is acceptable by the application
12. What is the primary reason the electrode is made of tungsten?
 - a. It does not oxidize at high temperatures
 - b. It has a very high melting point
 - c. It is resistant to fumes produced by welding
 - d. It has a low coefficient of thermal expansion
13. What gas is almost always used for TIG welding?
 - a. 75% argon/25% CO₂ mix commonly referred to as C25
 - b. Pure argon
 - c. Argon/helium/CO₂ mix commonly referred to as tri-mix
 - d. Pure helium
14. Which of the following are advantages of TIG welding over other processes? (Select all that apply)
 - a. Any material can be welded with the same equipment, only different filler rod is required
 - b. It produces zero spatter
 - c. It can weld poor-fitting joints well
 - d. With practice, it produces very aesthetically pleasing welds