

1. Among the type of carbon steel, identify the type which has got the best weldability.

- (1) High carbon steel (2) Medium carbon steel.
 (3) **Mild steel** (4) Low carbon steel.

Ans: 3

2. With reference to oxyacetylene welding, carburizing flame is one in which there is an excess of

- (1) Oxygen
 (2) **Acetylene**
 (3) Both oxygen and acetylene are in equal measure
 (4) None of the three are correct.

Ans: 2

3. During arc welding, the correct angle of the electrode with the weld line is

- (1) 90 degree (2) 40-50 degree (3) **70-80 degree** (4) 45 degree

Ans: 3

4. The amount of current setting for welding depends upon

- (1) Thickness of plate (2) type of current A.C. or D.C.
 (3) Type of metal to be welded (4) **diameter of electrode used**

Ans: 4

5. The function of filler rod in gas welding is

- (1) to increase the strength of the joint
 (2) **to obtain proper size of weld and to add additional elements**
 (3) to increase the fluidity.
 (4) to obtain good penetration.

Ans: 2

Filler rods

The term filler rod refers to a filler metal used in gas welding, brazing, and certain electric welding processes in which the filler metal is not a part of the electrical circuit. The only function of the filler rod is to supply filler metal to the joint. Filler rod comes in wire or rod form that is often referred to as "welding rod."

6. If oil, paint, grease and rust are not removed from the joining surface, the weld will be

- (1) Ductile (2) out of shape
 (3) weak and brittle (4) with less fluidity

Ans: 3

7. In arc welding the source of heat is

- (1) current (2) arc voltage
 (3) electricity (4) welding transformer.

Ans: 2

8. The little hole produced edge of the crater right under the tip of electrode is called

- (1) Blow hole (2) key hole (3) pin hole (4) root gap

Ans: 3

9. In lap fillet joint the overlap may be kept

- (1) same as thickness of plate to be welded
 (2) half the thickness of plate to be joined
 (3) 2 to 3 times the plate thickness
 (4) half the width of the plate

Ans: 3

10. Excess spatters in welding is due to

- (1) slow speed (2) high speed
 (3) excess current (4) bigger gauge of electrode

Ans: 3

11. For removing the water vapour from the acetylene gas the material used is...

- (1) Filter wool (2) Steel wool (3) Pumic stone (4) Paper filters.

Ans: 3

12. The colour code for identifying a gas cylinder containing oxygen is

- (1) Maroon (2) Black (3) Blue (4) Red

Ans: 2

13. The correct flame for preheating before cutting is

- (1) oxidising flame (2) Neutral flame
 (3) carburising flame (4) slightly carburising flame

Ans: 1

Types of Welding Flames

In oxyacetylene welding, flame is the most important tool. Three distinct types of flames are possible on adjusting the proportions of acetylene and oxygen:

1. Neutral Flame (Acetylene oxygen in equal proportions)
2. Oxidizing Flame (Excess of oxygen)
3. Reducing Flame (Excess of acetylene)

Neutral Flame A neutral flame is produced when the ratio of oxygen to acetylene, in the mixture leaving the torch, is almost exactly one-to-one. The temperature of the neutral flame is of the order of about 5900°F

Neutral flame is used for most welding operations and for preheating during cutting operations. When welding steel with neutral flame, the molten metal puddle is quiet and clear; the metal flows easily without boiling, foaming, or sparking.

The neutral flame is commonly used for the welding of: Mild steel Stainless steel Cast Iron Copper and Aluminum.

Oxidizing Flame: It occurs when the ratio of oxygen to acetylene required for a neutral flame is changed to give an excess of oxygen. This flame type is observed when welders add more oxygen to the neutral flame.

Oxidizing Flame (Acetylene and excess oxygen, 6300°F) For braze welding with Bronze rod. The presence of excess oxygen in this flame creates undesirable oxides to the structural and mechanical detriment of most metals. It is useful for welding copper base alloys, zinc base alloys, cast iron, manganese steel etc.

A reducing flame has an approximate temperature of 5500°F (which is lowest among all the three flames). A reducing flame may be distinguished from a carburizing flame by the fact that a carburizing flame contains more acetylene than a reducing flame. A carburizing flame is used in the welding of lead and for carburizing (surface hardening) purposes. A reducing flame, on the other hand, does not carburize the metal; rather it ensures the absence of the oxidizing condition. It is used for welding with low alloy steel rods and for welding those metals, (e.g. non ferrous) that do not tend to absorb carbon. This flame is very well used for welding **high carbon steel**.

<https://www.cedengineering.com/userfiles/Fundamentals%20of%20Gas%20Welding%20and%20Cutting%20R1.pdf>

14. Heavy coated electrode is normally suitable for

- (1) welding in flat position
 (2) deep groove joint in vertical position
 (3) A.C. welding
 (4) **thick plates in any position**

Ans: 4

15. The type of electrode that will pick up moisture easily is

- (1) Acidic coated electrode
 (2) rutile coated electrode
 (3) **basic coated electrode**
 (4) titanium coated electrode

Ans: 3

Basic coated electrodes **allow welding in all dimensional positions**, mainly with direct current DC+. With additional alloying these electrodes can be used for welding of high strength steels, heat resistant steels and facing welding works.

When containers or packings are punctured or opened, **low hydrogen electrodes** may pick up moisture. A greater amount of moisture in low hydrogen electrodes may cause porosity.

16. Identify the type of electrode that deposit the largest amount of weld metal per unit time

- (1) **Iron powder electrode**
 (2) low hydrogen electrode
 (3) Deep penetration electrode
 (4) heavy coated S.S.electrode

Ans: 1

17. The blow pipe fitted with injector will prevent

- (1) flash back
 (2) **reverse flow of acetylene gas**
 (3) flow of high pressure oxygen
 (4) defects

Ans: 2

There are two types of blowpipes:

- (1) High pressure,
 (2) Low pressure.

The high pressure blowpipe is a mixing device to supply equal volumes of oxygen and acetylene to the nozzle, and is filled with regulating valves to vary the pressure of the gases as required. The blowpipe is made of bronze or brass.

The injector is a device to produce and adjust a suitable oxy-acetylene flame in which the fuel gas is generated at low pressure. The low pressure blowpipe has an injector nozzle inside its body through which the high pressure oxygen streams out. This

oxygen draws the low pressure acetylene into the mixing chamber and gives it the necessary velocity to produce a steady flame.

The injector also helps prevent back-firing. If too much metal is reg. If too much metal is removed from the nozzle it tends to back-fire. The low pressure blowpipe is more expensive than the high pressure blowpipe as it can be used on a high pressure system if required.

18. Nozzles are generally made of copper because

- (1) Rusting will not take place
- (2) Able to get air tight fittings due to its fine threads
- (3) It is cheaper
- (4) It is having higher melting point

Ans: 1

19. If the blow pipe is moved to and fro frequently while cutting, the kerf will

- (1) be more
- (2) of correct size
- (3) be less
- (4) Not be affected

Ans: 1

20. If too little cutting oxygen is supplied

- (1) the metal will be cooled down
- (2) the kerf will be narrow
- (3) the kerf will be wide
- (4) the metal will fail to cut completely

Ans: 4

21. The small metal particles which are thrown out of the arc during welding are called

- (1) Slag
- (2) weld metal
- (3) spatters
- (4) stub

Ans: 3

22. A hair line separation in root or middle or surface of the weld metal or base metal is mainly due to

- (1) Slow cooling
- (2) larger dia electrode
- (3) Long arc length
- (4) lack of preheating and post heating

Ans: 4

Solidification cracks are normally readily distinguished from other types of cracks due to the following characteristic factors:
they occur only in the weld metal

they normally appear as straight lines along the centreline of the weld bead, but may occasionally appear as transverse cracking depending on the solidification structure. Solidification cracks in the final crater may have a branching appearance as the cracks are often 'open', they can be visible to the naked

CAUSES

The overriding cause of solidification cracking is that the weld bead in the final stage of solidification has insufficient strength to withstand the contraction stresses generated as the weld pool solidifies. Factors which increase the risk include:
 insufficient weld bead size or shape
 welding under high restraint
 material properties such as a high impurity content or a relatively large amount of shrinkage on solidification.
 Joint design can have a significant influence on the level of residual stresses.

BEST PRACTICE IN AVOIDING SOLIDIFICATION CRACKING

Apart from the choice of material and filler, the principal techniques for minimising the risk of welding solidification cracking are:
 Control joint fit-up to reduce gaps.
 Before welding, clean off all contaminants from the material
 Ensure that the welding sequence will not lead to a build-up of thermally induced stresses.
 Select welding parameters and technique to produce a weld bead with an adequate depth to width ratio, or with sufficient throat thickness (fillet weld), to ensure the weld bead has sufficient resistance to the solidification stresses (recommend a depth to width ratio of at least 0.5:1).
 Avoid producing too large a depth to width ratio which will encourage segregation and excessive transverse strains in restrained joints. As a general rule, weld beads whose depth to width ratio exceeds 2:1 will be prone to solidification cracking.
 Avoid high welding speeds (at high current levels) which increase the amount of segregation and the stress level across the weld bead.
 At the run stop, ensure adequate filling of the crater to avoid an unfavourable concave shape.

<https://www.twi-global.com/technical-knowledge/job-knowledge/defects-solidification-cracking-044>

23. The suitable filler rod for bronze welding of copper is

- | | |
|---------------------------------|-------------------------------|
| (1) brass filler rod | (2) copper filler rod |
| (3) manganese bronze filler rod | (4) silicon bronze filler rod |

Ans: 2

24. The suitable flux for welding of cast iron is

- (1) sodium borate (2) chlorides and fluorides of potassium
 (3) lithium chloride (4) magnesium chloride

Ans: 1

25. The gap between the plates in butt welding is given to
 (1) control distortion (2) avoid under cut
 (3) control penetration (4) prevent gas pockets

Ans: 3

26. Small diameter pipe end cutting may be done by
 (1) pipe cutter (2) oxy-fuel gas cutting
 (3) arc cutting (4) plasma cutting

Ans: 1

27. The purpose of inserting wire between the edges of pipes while doing butt weld is

- (1) To control distortion (2) to influence penetration
 (3) To maintain uniform root gap (4) to avoid burn through

Ans: 3

28. Purpose of normalising is

- (1) to prevent check (2) to refine coarse, abnormal grain structure
 (3) to control hardness (4) to make welding operation easier

Ans: 2

29. If the sum of one-half and one-fifth of a number exceeds one-third of that number by $7\frac{1}{3}$, the number is:

- 1). 15 2). 18 3). 20 4). 30

Ans: 3

Note: Given: $(\frac{1}{2} + \frac{1}{5})x - \frac{x}{3} = 7\frac{1}{3} \rightarrow x = 20.$

30. Which of the following is NOT a type of cut in a file?

- 1). Single cut 2). Double cut 3). Triple cut 4). Rasp cut

Ans: 3

31. Columbium added electrodes are used for welding stainless to prevent

- (1) Distortion (2) excess penetration (3) spatter (4) weld decay

Ans: 4

32. Porosity in stainless steel weld is due to

- (1) over size electrode (2) small dia electrode
 (3) damp electrode (4) unsterilized stainless steel electrode

Ans: 3

33. Of the four gases used for welding, identify the one that is available in liquid form

- (1) Helium (2) Acetylene (3) Nitrogen (4) Argon

Ans: 3

33. The type of electrode coating that is used to obtain metallurgically clean weld metal is known as

- (1) Arc initiators (2) slag former
 (3) De-oxidizers and de nitriders (4) Gas former

Ans:3

34. Cold cracks during welding are caused due to

- (1) High percentage of carbon (2) high percentage of sulphur
 (3) Effect of hydrogen (4) stopping the arc suddenly

Ans: 3

35. The practice of scratching the live electrode on the parent metal during watching will cause

- (1) Weld spatter (2) Arc strikes (3) Undercut (4) Over lap

Ans: 2

36. In oxyacetylene welding carburizing flame is used for

- (1) welding carbon steel (2) welding aluminium
 (3) for depositing surface metal (4) welding brass

Ans: 1

37. In thermit welding the most important oxide used for oxidation process is that of

- (1) copper (2) chromium (3) nickel (4) iron

Ans: 4

38. Normalizing is done to.....

- (1) reduce hardness of steel (2) improve machinability
 (3) refine grain structure (4) to alloy steel in gots

Ans: 3

39. Identify the type of carbon steel that requires pre heating for welding
 (1) high carbon steel (2) low carbon steel
 (3) mild steel (4) low carbon steel

Ans: 1

40. The steel that has got the best weldability is
 (1) high carbon steel (2) medium carbon steel
 (3) mild steel (4) low carbon steel

Ans: 3

41. The problems involved in welding Aluminium are
 (A) it oxidizes quickly
 (B) it has high thermal conductivity
 (C) it does not change its colour when heated

- (1) only (A), (B) are correct (2) only (A),(C) are correct
 (3) only (C) is correct (4) (A),(B),(C) is correct

Ans: 1

42. The welding that is used for critical components for aerospace application is...
 (1) Plasma arc welding (2) TIG welding
 (3) Electron beam welding (4) Oxy-acetylene welding.

Ans: 2

43. is the most noticed defect in aluminium welds
 (1) solidification cracks (2) hot short crack
 (3) Porosity (4) None of the three are correct

Ans: 3

44. Identify the point that is not a feature of laser cutting
 (1) cut has a wide kerf (2) low thermal distortion
 (3) cut has square edges (4) blind cut can be made

Ans: 4

45. The current to a M.S. Electrode of 4 mm is
 (1) 60 to 90 amps (2) 130 to 170 amps
 (3) 70 to 110 amps (4) 150 to 250 amps

Ans: 2

46. If the main electric supply is not available we can do arc welding with

- (1) motor generator set
- (2) transformer set
- (3) engine generator set
- (4) rectifier set

Ans: 3

47. The weaved beads are necessary

- (1) to join thin sections
- (2) mostly in vertical position welding
- (3) welding deep groove joints
- (4) while welding with transformer

Ans: 2

48. Name the pressure welding process in which the heat is obtained from the resistance offered to the flow of current

- (1) Spot welding
- (2) atomic hydrogen welding
- (3) high pressure oxy-acetylene welding
- (4) TIG welding

Ans: 1

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