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Comps A2

Assignment I

Welding Shop

CO4: Comprehend the process of PCB making, layout of house wiring & electric arc welding.

Q1)

A) d) 70-100 V

B) a) Current should increase voltage remains same.

C) c) Both AC or DC

D) c) Mortise Joint

Q2) What is welding electrode? Why electrodes are coated with flux?

Ans) Welding electrode is a piece of wire or rod, which can be of metal/alloy & has a flux with or without flux & carries an electric current to obtain sufficient heat for welding. At one end, it is fastened to a holder & an arc is established at the other end.

Electrodes are coated with metal flux (metal mixture) which gives off gases as it decomposes to prevent contamination, introduces deoxidizers to purify the weld, causes weld-protecting slag to form, improves the arc stability & provides alloying elements to improve weld quality.

Flux is a material which is essential to promote the fusion of metals & is employed in welding. The primary function being to prevent oxidation of the base & filler materials during welding.

Q3) what does arc welding mean? List types of Arc welding.

Ans) Arc welding is a welding process where we use an electric arc to generate heat to melt ~~two~~ and join metals. A power supply creates an electric arc between the consumable ~~or~~ or non consumable electrode & the base material using either ~~an~~ direct (DC) or Alternating current (AC).

The different arc welding techniques are:

- i) Gas metal arc welding (GMAW)
- ii) Flux-cored arc welding (FCAW)
- iii) Shielding metal arc welding (SMAW)
- iv) Gas Tungsten arc welding (GTAW)
- v) Plasma arc welding (PAW)
- vi) Submerged arc welding (SAW)

Q4) with circuit diagram, explain working principle of Arc welding process.

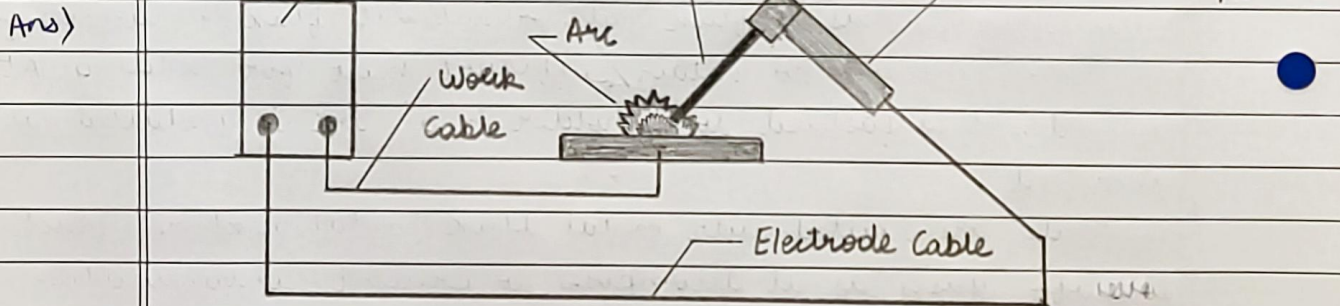


Fig: Arc welding Circuit Diagram

An AC or DC power source is fitted with whatever controls may be needed, is connected by work cable to the workpiece & by an electrode cable to the electrode holder of some type which then makes electric contact with the welding electrode. An arc is connected across the gap when this energised circuit & touches the tip of electrode touches the workpiece and is withdrawn yet still in close contact. The arc produces a temperature of about 6500°C at its tip.

The heat melts both the base metal & the electrode producing a pool of molten metal, sometimes called as the creator. The creator solidifies behind the electrodes as it is moved along the joint. This result is a fusion bond.

Q5) What are the advantages & dis-advantages of Arc welding?

Ans) The advantages of using arc welding are:-

- i) Low price: Arc welding is a low-cost method which means one can carry it out with a limited budget & there is no expensive machinery involved in the process.
- ii) High welding performance: Arc welding has high heat concentration which allows us to complete the process rapidly. It welds two parts smoothly, therefore saving up on a lot of time.
- iii) Portability: These materials are very easy to transport.
- iv) Shielding gas isn't necessary: Processes can be completed during wind or rain and spatter isn't a major concern.

The disadvantages of using arc welding are:

- i) Lower efficiency: Arc welding generates more waste than any other technique, which is why it may raise projects costs.

- ii) Not ideal for long runs: This technique can have difficulty following along with long seams, where slight variance can ~~also~~ defeat the end product.
- iii) High skill level: operators need a high level of skill of training.

Q6) What safety precautions are to be taken while performing arc welding.

- i) Protect eyes, skin, ears. Keep your head out of fumes. Don't breathe the fumes. If inside, ventilate the area or extractor at the arc to remove welding fumes of gases.
- ii) Protect from flying sparks & hot metal. wear approved face shields or safety goggles wear proper body protection to protect against
- iii) Protect against fire / explosives. Don't weld while flying sparks can strike flammable material. Remove such material from within 10m of the welding arc area. Insulate other equipments.
- iv) Prevent electric shocks. Don't wrap cables around body. Turn off all equipments when not in use. Do not touch live electric parts. Insulate yourself from work ground using dry insulating. When making input connections, attach proper grounding conductor first.
- v) Be familiar with owners manual, warning labels and relevant codes.
- vi) Pacemaker wearers should keep away from arc welding equipments.