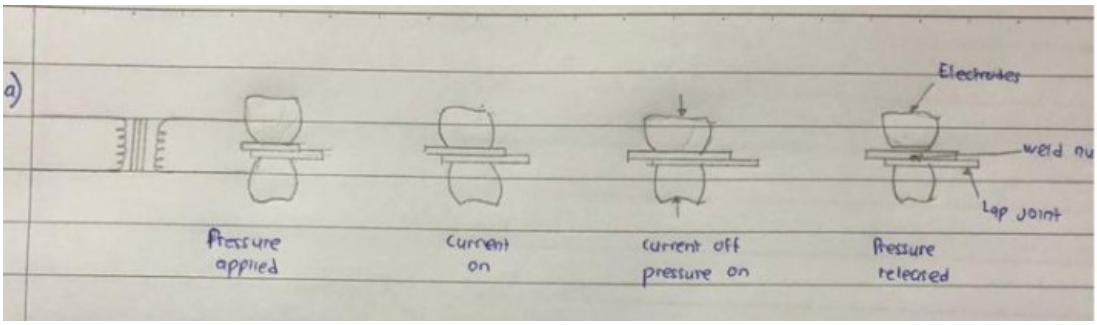
QUESTION 1.

a) Illustrate resistance sport welding process and explain **two** (2) disadvantage of the process.

(5 Marks)



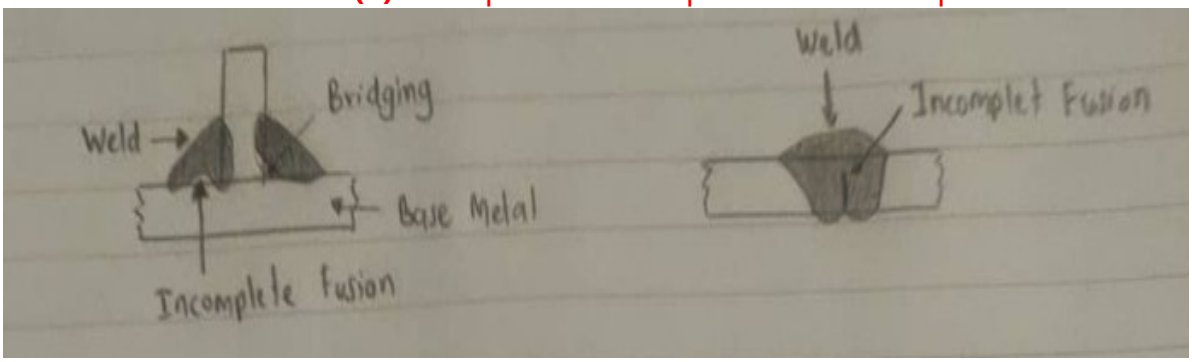
Disadvantages
- installment cost is more
- this type of welding gets deformed.

b) Discuss porosity in welding and provide **two (2)** reasons why this defect occurred.

(3 Marks)

c) Ilustrate and label **two (2)** examples of incomplete fusion and penetration defect and give one (1) solution to overcome this problem.
(4 Marks)

Ilustrate and label **two (2)** examples of incomplete fusion and penetration



one (1) solution to overcome this problem
-Raising the temperature of the base metal.

-Cleaning the weld area before welding.
-Modifying the joint design.
-Providing sufficient shielding gas.

QUESTION 2.

a) Explain the proportion ration of acetylene and oxygen in the gas mixture of **three (3)** types of the flame produced.

(4 Marks)

-at a ratio of 1:1 the flame is neutral

-for greater oxygen supply, it is known as an oxidizing flame

-for insufficient oxygen, the flame is a reducing or carburizing flame

b) Resistance spot welding is the simplest and widely used for thin metals. Explain why resistance spot welding suitable for the applications.

(3 Marks)

why resistance spot welding suitable for the applications

- required pressure is supplied through mechanical or pneumatic means - due to lower thermal conductivity and higher electrical resistance, steel is comparatively easy to spot weld, with low carbon steel being most suited to spot welding

c) Brazing and welding are the methods of joining metal. Compare the differences between brazing and oxy-fuel gas welding.

(3 Marks)

QUESTION 3.

a) Illustrate the crack defect in welding and state **three (3)** causes of the defects.
(4 Marks)

3 causes of defect:
1.Temperature Gradient
2. Hydrogen embrittlement
3. Inability of the weld metal to contact during cooling

b) Weld profile is important because it has significant effects on the weld strength and appearance. Distinguish overlap and undercut of a weld profile.
(3 Marks)

c) Propose any **two (2)** welding defects that can be prevented by modifying the joint design and justify the importance of redesign the joint.
(3 Marks)

QUESTION 4.

a) Some welding process use coated and coated electrode. Explain **four (4)** functions of electrode coatings in welding process.
(4 Marks)

four (4) functions of electrode coatings in welding process

1.Improving the arc stability by providing certain chemicals which have this ability by ionizing the path of arc

2.Protective slag over hot metal

3.Provide flux, which helps to remove oxides and other impurities from the molten metals

4.Slow down the cooling rate of the weld

b) Soldering is one of the metal joining process. Explain the soldering process and provide **one (1)** advantage of the process.
(3 Marks)

Soldering is the method of connecting two metal parts at temperatures below 450 ° C with the aid of appropriate filler material. Or it's a metal joining process at a temperature below 450 ° C.

The advantage is:

- **dissimilar metals can be joined**
- **the soldering can be done at low temperature and low amount of power is required to heat the soldering iron.**

c) Porosity is one of common welding defect. Describe **three (3)** methods to rectify porosity in welding.
(3 Marks)

three (3) methods to rectify porosity in welding.

1.Solution: Clean your metal thoroughly before you weld it.

2.Solution: Use the correct amount of shielding gas.

3.Solution: Store your electrodes in a clean, dry place.

QUESTION 5.

a) Shielding gas is crucial to ensure the welding quality. Give **two (2)** types of welding defects which can be solved by using shielding gas. For each the given defects, explain one (1) root course.
(3 Marks)

two (2) types of welding defects which can be solved by using shielding gas

1. **Undercut**

Cause: Incorrect electrode usage /improper selection of gas shield.

2. **Slag Inclusion**

Cause: for oxide, electrode coating or fluxes trapped.

b) What type of flame is recommended in oxy-fuel gas welding? Briefly describe how to obtain the flame.
(4 Marks)

type of flame
i) Neutral flame
ii) Oxidizing flame
iii) Carburizing flame
• At ratio of 1:1, the flame is neutral
• For greater oxygen supply, it is known as an Oxidizing flame
• For insufficient oxygen, the flame is a reducing, or Carburizing flame .

c) In joining of copper piping in air conditioning system, suggest **one (1)** suitable type of welding method. For the selected process, explain the process operation with appropriate sketch. (3 Marks)

QUESTION 6.

a) In arc welding, an electrode is used to conduct current through a work piece to fuse two pieces together. Determine the purpose of electrode coating.
(4 Marks)

1.stabilize the arc.
2.Generate gases to act as sheild.
3.control the rate at which the electrode melts.
4.act as a flux to protect the weld.
5.add alloying elements to the weld zone to enhance the properties of the joint.

b) Resistance spot welding widely used in assembly body car panel. Explain the advantages of resistance spot welding.
(3 Marks)

the advantages of resistance spot welding.
1.high production rate
2.required little skill to operate the resistance welding process
3.possible to weld dissimilar metal with different thickness

c) Porosity is one of common welding defect. Describe the **three (3)** methods to rectify porosity in welding.
(3 Marks)

three (3) methods to rectify porosity in welding
-proper selection of electrodes and filler metals
-proper cleaning and the prevention of contaminants
-reduced welding speeds