



Province of the
EASTERN CAPE
EDUCATION

DIRECTORATE SENIOR CURRICULUM MANAGEMENT (SEN-FET)

HOME SCHOOLING SELF-STUDY WORKSHEET ANSWER SHEET

SUBJECT	WELDING & METALWORK	GRADE		DATE	20 MAY 2020
TOPIC	JOINING METHODS	TERM 1 REVISION	(Please tick)	TERM 2 CONTENT	(√)

QUESTION 1 JOINING METHODS (WELDING INSPECTION)

1.1 Non-destructive tests:

- Liquid dye penetrant test
- X-Ray test
- Ultrasonic test

1.2 Nick-break test:

- Make a hacksaw cut through the centre of the weld.
- Cut should be about 6,5 mm deep.
- Place the saw-nicked specimen on two steel supports.
- Use a sledgehammer to break the specimen by striking it in the zone where you made the saw cuts.
- The weld metal exposed in the break should be completely fused and should be free from slag inclusions and contain no gas pockets greater than 1,6 mm.
- There should be not more than one pore or gas pocket per square centimetre. (ANY 5)

1.3 Factors of a good arc:

- The surface condition
- The travel speed
- The welding current
- The arc voltage
- The angle of the torch/electrode/shroud (ANY 4)

1.4 Welding defects:

- Incomplete penetration
- Lack of fusion
- Porosity
- Undercutting
- Distortion
- Cracks
- Spatter
- Slag inclusion (ANY 4)

1.5 Methods to reduce stress:

- Peening
- Controlled heating, followed by controlled cooling

1.6 Welding spatter:

- It is the little droplets of molten material that are generated at or near the welding arc.

It is generally regarded as a nuisance and is a critical factor to consider when developing an application.

1.7 Cause of spatter:

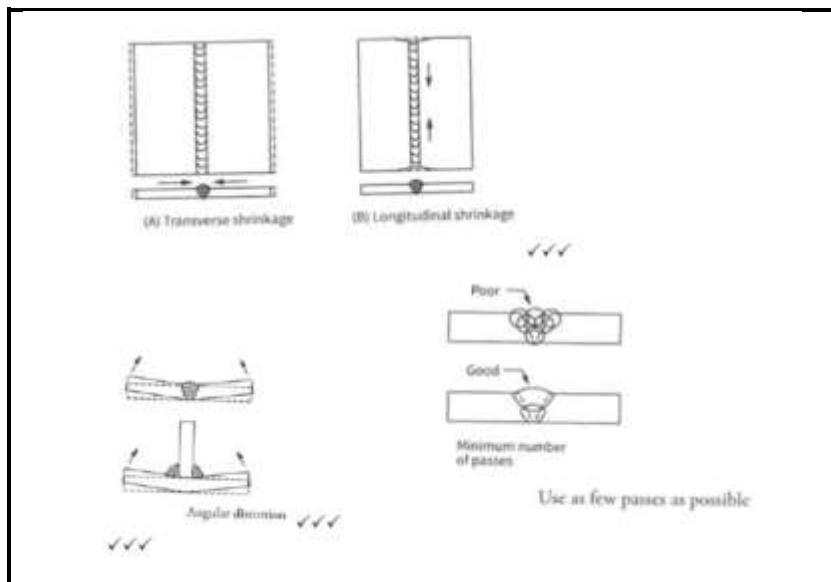
- A disturbance in the molten weld pool during the transfer of wire into the weld, caused by voltage being too low or amperage being too high.

1.8 Oxy-acetylene mild steel flame:

- Neutral flame

QUESTION 2 JOINING METHODS (STRESSES AND DISTORTION)

2.1



2.2 Types of cracks:

- HAZ stands for: (Heat affected zone) cracks
- Centre line cracks
- Crater cracks
- Transverse cracks

2.3 Criteria for free bend test:

- It measures the ductility of the weld deposit and the heat affected area adjacent to the weld.
- It is used to determine the percentage of elongation of the weld metal.

2.4 Advantages of liquid dye over X-ray or ultra-sonic test:

- Good for ferrous and non-ferrous metals
- Low cost
- Easy to apply and interpret
- Minimal training required (Any 3)