education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL TECHNOLOGY

NOVEMBER 2008

MEMORANDUM

MARKS: 200

This memorandum consists of 11 pages.

SECTION A

QUESTION 1

1.1 C✓✓✓
1.2 B✓✓✓
1.3 A✓✓✓
1.4 C✓✓✓
1.5 C✓✓✓
1.6 A✓✓✓
1.7 B✓✓✓
1.8 C✓✓✓
1.9 C✓✓✓
1.10 C✓✓✓
1.11 C✓✓✓
1.12 B✓✓✓
1.13 A✓✓✓
1.14 B✓✓✓
1.15 B✓✓✓

[45]

TOTAL SECTION A (15 x 3): 45

SECTION B

QUESTION 2: MATERIALS AND STRUCTURES

2.1 2.1.1 To prevent the sheets from rusting. (Corrosion) (oxidation**)** (protection**)**✓ (1)

2.1.2 Mild steel sheets are cleaned with hydrochloric acid, ✓ then fluxed with zinc-chloride ✓ and dipped into molten tin. ✓ (3)

2.1.3
- In food processing (tinned food, cans) ✓
- For trays ✓

Cups and mugs
Tinned plates (any two) (2)

2.1.4 The process is called oxidation. ✓
Oxidation is the slow process of metal deterioration. ✓This process takes place when pure metals✓ are exposed to oxygen ✓ and water. ✓ (5)

2.1.5
- Electroplating ✓
- Painting ✓
- Galvanising (any two) (2)

Chroming
Polishing

2.2 2.2.1 Concrete starts setting after 1hour, ✓and must not be re-mixed after that period. The concrete will loose its strength , ✓ because the chemical bonding process was stopped. ✓ (3)

2.2.2
- Make sure of the size/measurements of the foundation. ✓
- The mixture of the cement in the foundation. ✓
- Drainage of exess water away from the structure.✓ (3)

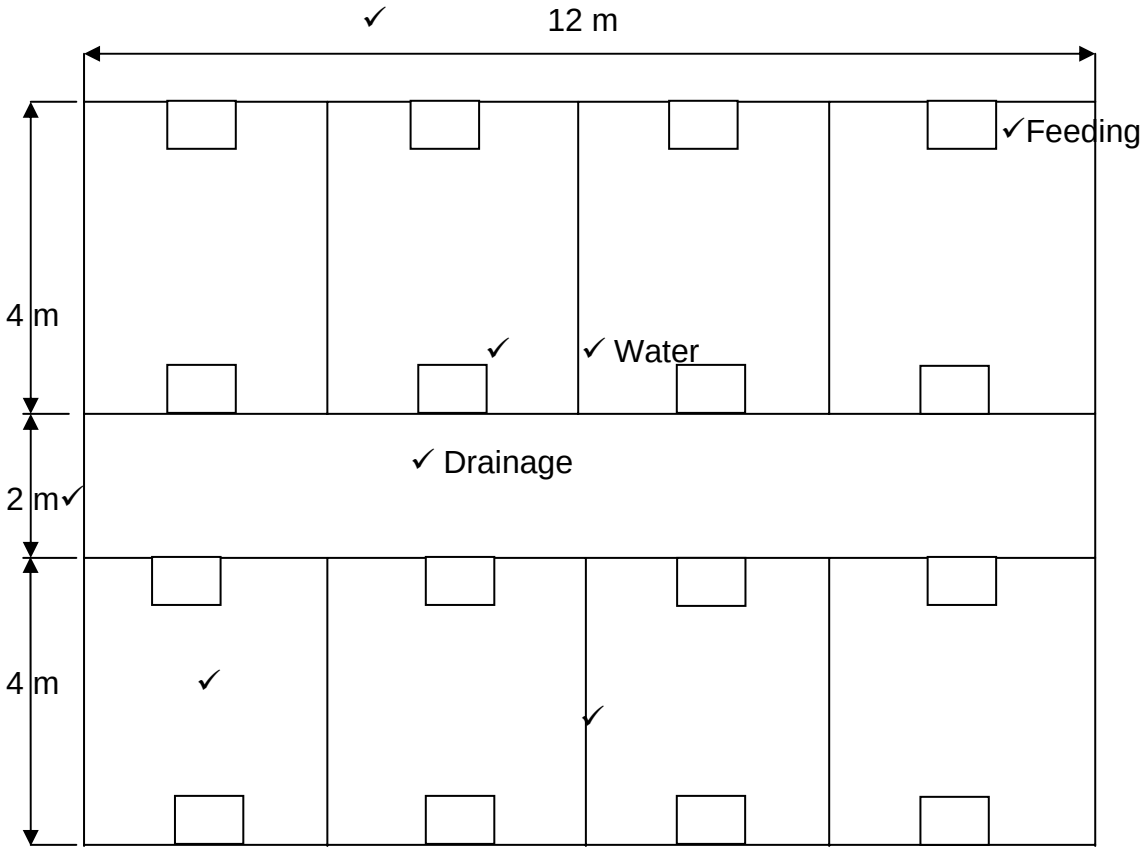
Reinforcement . (Wider and thicker.) (any three)

2.3 2.3.1 Carry stress/load of roof. ✓ (1)

2.3.2 (2) Knock✓
(3) Struts✓
(5) Beam✓ (3)

2.3.3 Triangles because of their specific shape/design are very strong. ✓
It strengthens the construction so that the struts can carry the weight of the roof. ✓ (2)

2.4



(10)
[35]

<u>To the marker</u>
This is the technical process that has been followed and it will differ according to individual learners and their own experience and pre-knowledge.
Identify the criteria during the marking process.
Award the marks according to the criteria.

QUESTION 3: ENERGY

3.1 3.1.1 Solar energy/Sun energy✓/light (1)

3.1.2 Inverter/transformer. ✓(converter) (1)

3.1.3 Yes. ✓
The electric energy produced during daytime ✓can be used to charge a battery that can be used during night time. ✓ (3)

3.1.4
- Sunlight is free. ✓
- Pollution free. ✓
- Low maintenance cost
- Can be used in remote areas where no electricity is available.

(any two) (2)

3.1.5
- Sun energy is not available during the night time. ✓
- A cloudy day makes this energy source ineffective. ✓
- Produce low amounts of energy at low voltage and amperage. ✓
- High installation cost. (any three)

(3)

3.1.6
- Follow the manufacturer's specifications. ✓
- Adhere to national safety standards. ✓

(2)

3.2 3.2.1 Battery/Accumulator. ✓ (1)

3.2.2 A Battery/Accumulator ✓
B Ignition switch✓(key, ignition key, starter switch)
C Ignition coil✓
D Distributor✓
E High tension leads/Sparkplug wires/Secondary conductors✓ (5)

3.2.3 Ignition coil. *I*C✓ (1)

3.2.4 Negatively. ✓ (1)

[20]

QUESTION 4: SKILLS AND CONSTRUCTION PROCESSES

4.1 4.1.1

- Make sure that all rust, grease, dirt and/or any other substances, which can weaken the join has been removed, before starting with the process of joining. ✓
- Remove the surface layer of the metal where the join is to be made. ✓
- Cover the suspect area with white chalk. Vaseline in the cracks will colour the chalk grey or show a wet line.✓
- Mark the line by means of a prick-punch and hammer to prevent the line from disappearing when grinding out the V-groove.✓
- Arc must be a little longer than when welding mild steel. ✓
- Use a pure nickel-welding rod. ✓
- Amperage must be as low as possible. ✓
- It is very important that the casting is kept as cool as possible during the welding process.✓
- Casing should be allowed to cool down slowly after welding. ✓
- Pre-heating of a casing to be welded can help to prevent it from forming new cracks.✓ (10)

4.1.2 It will crack, ✓because of uneven cooling. ✓ (2)

4.2 4.2.1 Filler wire/wire. ✓This wire melts to form the joint between the two metals that you want to join. ✓ (2)

4.2.2 Shielding gas CO_2✓ (1)

4.2.3 The filler wires gets too short. ✓
Use anti-spatter or spatter release. ✓ (2)

4.2.4 MIG contact tip ✓ (1)

4.2.5

- Use a welding helmet. ✓
- Protect your body by wearing a leather apron and gloves. ✓ (2)

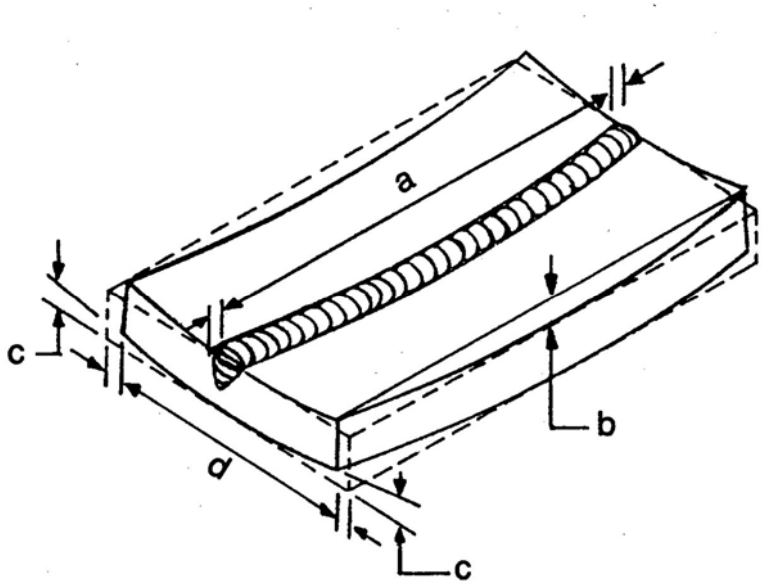
4.2.6 Electricity / CO_2 gas. ✓ (1)

4.3

- Requires a reduced melting pool, big enough to create the wanted penetration.✓
- Done by reducing the size of the flame.✓
- Force of the flame will help to keep the molten metal positioned. ✓ (3)

4.4 4.4.1

a) Longitudinal shrinking✓
b) Angular shrinking longitudinally✓
c) Angular shrinking✓
d) Lateral shrinking✓ (4)



4.4.2

- Clamping ✓
- Patch work ✓
- Make use of short welding runs. (Any two) (2)

4.4.3

- Heating to an acceptable temper temperature. ✓
- Cooling at a controlled temperature. ✓ (2)

4.5

- See that the surface is clean and slightly warm. ✓
- Apply a layer of polish. ✓
- Allow it to dry and rub in.✓ (3)

[35]

QUESTION 5: TOOLS, IMPLEMENTS AND EQUIPMENT

5.1 5.1.1
- Connected to the three-point mechanism of the tractor. ✓
- Top link. ✓
- Connect to the PTO shaft . (3)

5.1.2 PTO / Power take-off✓ (1)

5.1.3 Levelling box. ✓ (1)

5.1.4
- Must appear neat. ✓
- Safeguard the equipment. ✓
- Removed and replaced easily. ✓
- Do not become loose easily.
- Weight saving. (3)
- Keep out all undesired matter. (any three)

5.2 5.2.1 Thermo siphon cooling system. ✓ (1)

5.2.2
A Radiator ✓
B Fan ✓
C Water jacket ✓
D Connecting rubber hose ✓ (4)

5.2.3
- It is based on the principle of circulating water in the cooling system through the rise of heat. ✓
- The water surrounding the cylinders of the engine, heats up ✓and then flows upward to the highest point in the engine block where it exits to enter the radiator through the upper radiator hose into the header tank. ✓ (3)

5.2.4
- Perished rubber seal ✓
- Tension spring that looses its tension ✓
- Water pressure too high inside engine. (overheats) (any two) (2)
- Because of a loose cap.

5.3 5.3.1 A Helical gear ✓
B Straight cut gear ✓ (2)

5.3.2

	HELICAL GEAR	STRAIGHT CUT GEAR
APPLICATION	Gearbox✓ Differential	Final drive✓ Gear box
ADVANTAGE	Lasts a long time. ✓	Can be meshed from the side. ✓ No side thrust.
DISADVANTAGE	Subjected to side thrust under load. ✓	Noisy. ✓

(6)

5.3.3 Cast iron ✓ (1)

5.3.4 Low viscosity oil ✓ (1)

5.4 5.4.1 A is the better one because:✓
- The tension on the clutch plate can be changed. ✓
- A has a universal joint for angular movement. ✓ (3)

5.4.2 Dismantle the slip clutch, clean it ✓and reassemble it but do not put the springs under tension. ✓ (2)

5.4.3 Point on the machine where different parts come into contact that causes friction where you must apply lubrication in the form of grease with a grease gun. ✓ (1)

5.5
- Cut steel, concrete ✓
- Grinding
- Finishing off

(any one) (1)
[35]

QUESTION 6: WATER MANAGEMENT

6.1 6.1.1 A Electrical submersible pump. ✓
B Rotary pump. ✓ (2)

6.1.2
- Purpose of pump or purpose of use.✓
- Required delivery, quantity of water needed.✓
- Water quality has an affect on material of pump. ✓
- Type of power source available. ✓
- Mobility of pump to be used in different locations. ✓
- Simplicity of design for easy/cheaper repairs.
- Maintenance required.
- Self installation. (any five) (5)

6.1.3
- If the motor is not 100% watertight it can be damaged. ✓
- The pump can only be driven by electricity. ✓ (2)
- If the water level drops too low the pump unit can be damaged.
- Plants roots or foreign objects can block valves and sieves.

(any two)

6.1.4 Sieve or grid. ✓ (1)

6.2 6.2.1
- No labourers needed to shift the pipes/system. ✓
- One-man operation. ✓
- Automated watering system/scheduling.
- Pesticides/fertilizers are applied through the system. (any two) (2)

6.2.2 So that the quantity of water that is administered to the crop can be equal ✓from the centre of the land to the outer edge. ✓ (2)

6.2.3 Inner nozzles smaller✓ and further apart than outer nozzles.✓ (2)

6.2.4
- Fertilisers with a high acid content. ✓
  Acid will corrode the galvanized pipes ✓
- Fertilisers with a large particle size. ✓
  Large particles will block the nozzles ✓ (4)

6.2.5 Cell phone **/**two way radio /computer✓ (1)

6.2.6
- Burry deep enough✓so that implements cannot damage it.✓
- Burry in sand ✓so that it can be repaired easily. ✓
- Apply thin layer of lime✓ just above the pipe to serve as an indicator to the operator of the machines that he is near the pipe.✓
- Draw a map of the exact position of the pipeline. (6)

(3 x 2)

6.3 6.3.1 Automatic water supplier/Pipe with small holes. ✓ (1)

6.3.2
- Pressure high enough to satisfy needs.✓
- Prevent spillage. ✓
- Joints must be watertight.
- Removal of spillage water.
- Protection of all the valves.
- Placing of troughs.

(any two) (2)
[30]

TOTAL SECTION B: 155

GRAND TOTAL: 200