



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

AGRICULTURAL TECHNOLOGY

FEBRUARY/MARCH 2011

MEMORANDUM

MARKS: 200

This memorandum consists of 11 pages.

SECTION A**QUESTION 1**

1.1	B	✓✓
1.2	B	✓✓
1.3	A	✓✓
1.4	C	✓✓
1.5	B	✓✓
1.6	A	✓✓
1.7	A	✓✓
1.8	B	✓✓
1.9	B	✓✓
1.10	A	✓✓
1.11	B	✓✓
1.12	A	✓✓
1.13	A	✓✓
1.14	B	✓✓
1.15	A	✓✓
1.16	C	✓✓
1.17	C	✓✓
1.18	A	✓✓
1.19	B	✓✓
1.20	A	✓✓

TOTAL SECTION A: 40

SECTION B**QUESTION 2: MATERIALS AND STRUCTURES**

- 2.1 2.1.1
- Increases resistance against corrosion. ✓
 - Promotes the hardness of steel. ✓
 - Improves strength. ✓
 - Improves resistance to the forming of scale. ✓
 - Improves tensile strength. ✓
 - Decreases magnetism.
 - Most chromium steels can be welded well. (Any 5) (5)
- 2.1.2
- Show the three smaller kraals and the main assembling area. (4)
- Show gates and passages. (1)
- Show measurements. (1)
- Realistic design and workability (4)
- (Any realistic design will be accepted)
- 2.2
- Pressure should be high enough to satisfy needs. ✓
 - Prevent spillage. ✓
 - Joints should be watertight. ✓
 - Removal of spillage water. ✓
 - Protect all valves. (Any 4) (4)
- 2.3 2.3.1
- The soil texture ✓determines the width, thickness and reinforcement of the foundation. ✓ (2)
- 2.3.2
- Pink aerolite✓
 - Foil sheets.
 - Shredded newspaper (Any 1) (1)
- 2.3.3
- Clean with hydrochloric acid.✓
 - Paint a prescribed undercoat. ✓ (2)
- 2.4
- Bonnox✓
 - Jackal proof netting✓
 - Wire mesh✓
 - Chicken mesh
 - Steel wire (Any 3) (3)
- 2.5 **Cohesion:**
- Inherent strength of the adhesive./Force between molecules of the same kind ✓
- Adhesion:**
- Ability of the molecules of an adhesive, to stick to the molecules of other substances. ✓ (2)

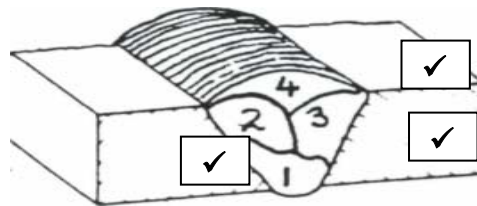
- 2.6 2.6.1 B ✓ (1)
- 2.6.2 When using the method in B the wall will be stronger ✓because of the overlapping of the bricks. ✓ (2)
- 2.6.3 • Make sure of the size/measurements of the foundation. ✓
• The mixture of the cement in the foundation. ✓
• Drainage of excess water away from the structure. ✓ (3)
- [35]**

QUESTION 3: ENERGY

- 3.1 3.1.1
- Sulphuric acid. ✓
 - Distilled water. ✓
- (2)
- 3.1.2
- Lead. ✓
- (1)
- 3.1.3
- Chemical energy. ✓
- (1)
- 3.1.4
- Direct current. ✓
- (1)
- 3.2 3.2.1
- Heat. ✓ Solar/Sun geyser, solar cooker. ✓
 - Electricity. ✓ Solar cell/Photo-electric cells. ✓
- (4)
- 3.2.2
- Non-polluting. ✓
 - Safe. ✓
 - Free. ✓
 - Abundant. ✓
- (Any 4) (4)
- 3.3 3.3.1
- Electricity/Shock/High voltage ✓
- (1)
- 3.3.2
- On a place where everyone can see it clearly. ✓
 - High enough to be safe from vandalism etc.
- (Any correct and acceptable answer will be accepted) (1)
- 3.3.3
- Remove person to a safe place by pulling him by his clothes/insulating medium. ✓
 - Make him comfortable and warm. ✓
 - Apply emergency treatment ✓
 - Switch off the current and remove lead. ✓
 - Call for help ✓
- (5)
[20]

QUESTION 4: SKILLS AND CONSTRUCTION PROCESSES

- 4.1 4.1.1 Oxidised flame ✓ (1)
- 4.1.2 Add more oxygen than acetylene to the flame ✓ (1)
- 4.1.3 Lap joint ✓ (1)
- 4.2 4.2.1 Start at the bottom of the joint and weld upwards ✓ (1)
- 4.2.2 • 60° ✓ (1)
- 4.2.3 • By regularly flicking the torch to the side (Zig Zag movement) ✓ and allowing the puddle to cool slightly.
• Decrease the force of the flame slightly. ✓ (2)
- 4.3 4.3.1 • Show the two pieces of metal with the four welding runs. (1)
• Show the sequence of runs 1 to 4. (2)
• Correctness and neatness will be taken into consideration. (1)



- 4.3.2 • Increase the welding speed. ✓
• Change the angle of the electrode. ✓
• Decrease the amperage slightly. ✓ (3)
- 4.3.3 • Pipe welding ✓
• Overhead welding ✓
• Vertical up/down welding.
• Welding of cast iron.
• Welding of aluminium. (Any 2) (2)
- 4.4 4.4.1 • MIG welder ✓
• CO₂ gas ✓ (2)
- 4.4.2 • High alloy steel (stainless alloys) ✓
• Aluminium ✓
• Mild steel ✓ (3)

- 4.4.3
- High welding speed/Faster ✓
 - Important savings in materials and weight ✓
 - High mechanical properties of welding joints. ✓
 - Neat and smooth seam surface ✓
 - Guaranteed welding strength for root and layer welding.
 - Safety against cold shuts and cracks.
 - Welding in all positions, vertical up, down and overhead.
 - Excellent fusion and penetration.
 - Operation requires less manual skills.
 - Welding area is easier to see.
 - No heavy slag to control or to chip away, compressed gas seals the weld pool.
 - Potentially cheaper.
 - Welds a wider range of thickness.
 - Welding wire runs from a spool and need not to be replaced regularly.
- (Any acceptable correct answer can be accepted) (Any 3) (3)
- 4.4.4
- No inflammable materials nearby. ✓
 - Special welding screens should be in place. ✓
 - Good ventilation is essential. ✓
- (Any correct answer will be accepted) (3)
- 4.5 4.5.1
- Arc-welding machine. ✓ (1)
- 4.5.2
- Transforms the low voltage alternating current into high voltage direct current ✓ (1)
- 4.5.3
- Mild steel. ✓
 - Cast iron. ✓ (2)
- 4.6 4.6.1 Alternating current (AC) ✓ (1)
- 4.6.2 Aluminium. ✓ (1)
- 4.6.3
- Compact, light. ✓
 - Electricity consumption is very low/Uses low current. ✓ (2)
- [35]

QUESTION 5: TOOLS, IMPLEMENTS AND EQUIPMENT

- 5.1 5.1.1
- Ensure that all electrical connections are tight. ✓
 - Check for loose wires. ✓
 - Make sure that there is no damage to the extension wire.
 - Check that the earth wire is connected.
 - Switches must work properly.
 - Make sure that the wires are correctly connected inside the 3-point plug. (Any 2) (2)
- 5.1.2
- V-belts do not easily slip off pulleys. ✓
 - V-belts draw tighter round pulleys when tension increases.
 - Lubrication is never necessary. ✓
 - V-belts are relatively strong, and under normal circumstances do not easily break. ✓
 - Cold, moist conditions, age or use do not cause V-belts to stretch or shrink. ✓
 - V-belts last longer than flat belts. (Any 4) (4)
- 5.2 5.2.1
- It has a bale shape mechanism that tightly rolls the hay into a round bale. ✓
 - Baling chamber is initially small but enlarges gradually as the hay is fed into the chamber. ✓
 - A tensioning system of pulleys, belts and chains keeps the tension of the bale constant while it is turning around. ✓
 - If the bale is large enough ropes are bounded around the bale and then ejected. ✓ (3)
- 5.2.2
- Remove all plant material from the baling chamber. ✓
 - Clean the baler properly. ✓
 - Drain and replace all oil. ✓
 - Release the tension on all drive belts. ✓
 - Remove all chains, clean and oil them, and replace them. ✓
 - Dismantle all slip clutches, clean them and reassemble them but do not put the springs under tension. ✓
 - Reduce bale chamber tension completely. ✓
 - Cover all unpainted areas with a thin layer of grease. ✓
 - Grease all grease nipples.
 - Store the baler in a dry place under cover. (Any correct answer will be accepted) (Any 8) (8)
- 5.2.3
- One-man operation ✓
 - Low rope consumption ✓
 - Simplistic working ✓
 - Can bale until rain starts ✓ (Any 2) (2)

- 5.3 5.3.1
- Fuel level✓
 - Water level✓
 - Oil level✓
 - Tyre pressure✓
 - Any liquid leaks. Oil, water or fuel. ✓
 - Any repairs needed. (Electrical etc.)
 - Loose electrical wires
 - Battery
- (Any correct answer will be accepted) (Any 5) (5)
- 5.3.2
- Soil resistance. ✓
 - Forward speed of the tractor. ✓
 - Ploughing depth. ✓
- (3)
- 5.4 5.4.1
- Removes all impurities from the air. ✓
 - Have sufficient capacity so that intervals between cleaning are of reasonable length. ✓
 - Let enough air through for engine to work effectively. (Any 2) (2)
- 5.4.2
- The filter must collect dust, ✓to prevent it to mix with the oil ✓in the sump to form a grinding paste. ✓
(Any relevant explanation can be accepted) (3)
- 5.5 5.5.1
- It must be installed in such a way that it can be handled with ease.✓
 - It must be placed in a well-ventilated area. ✓
 - Fodder must be off loaded next to the hopper. ✓
 - Hammer mill should be placed near the feed mixer/silo to reduce labour. ✓
- (Any practical relevant explanation can be accepted) (4)
- 5.5.2
- Regular lubrication. ✓
 - Hammers should be replaced with the correct type. ✓
 - Hammer mill must be correctly mounted. ✓
 - Power take-off shaft coupling must be done correctly. ✓
 - Clean after each job.
 - Sieves and screens must be inspected on a regular basis.
- (Any 4) (4)
- [40]**

QUESTION 6: WATER MANAGEMENT

- 6.1 6.1.1
- The bottom of the trench is loosely packed with large stones. ✓
 - It is then covered with smaller stones. ✓
 - Finally it is covered with gravel and soil. ✓
- (3)
- 6.1.2 Herringbone ✓ (1)
- 6.2
- A layer of Lime must be approximately 200 mm above the pipe, to indicate the pipe line in future for safety purposes. ✓
 - Bury deep enough not to be damaged by implements. ✓
 - Bury in sand. ✓
 - Couplings must be firm and watertight.
- (Any acceptable correct answer will be accepted) (Any 3) (3)
- 6.3 6.3.1 Even distribution of water over the required area. ✓ (1)
- 6.3.2
- Galvanised metal. ✓
 - Brass. ✓
 - Plastic.
- (Any 2) (2)
- 6.3.3
- Aim. ✓
 - Rate of flow. ✓
 - Quality of water. ✓
 - Availability of power/electricity. ✓
 - Mobility of pump. ✓
 - Simplicity of construction. ✓
 - Attention needed.
 - Cost and availability of parts.
 - DIY installation.
- (Any 5) (5)
- 6.3.4
- The pump must be driven from the surface with a shaft. ✓
 - Direction of revolution must always be maintained to prevent the shafts from becoming unscrewed. ✓
- (2)
- 6.4 6.4.1
- When the available water is scarce. ✓
 - Surface gradient (steep) leads to erosion. ✓
 - Infiltration tempo not constant. ✓
 - Drainage problems.
- (Any 3) (3)
- 6.4.2
- Minimum labour costs. ✓
 - Low pump costs. ✓
 - Low maintenance. ✓
 - Durable. ✓
 - High second hand value. ✓
 - Connected to cellphone/computer.
 - Accurate scheduling can be done
- (Any other correct answer will be accepted) (Any 5) (5)

6.5	6.5.1	<ul style="list-style-type: none">• Not be too high. ✓• Not be too deep. ✓• Not be too wide. ✓• Build in such a manner as to prevent the animals to get their feet wet. ✓• Easy to clean.• Not be able to defecate in the water.• Animals should not be able to climb in. <p>(Any acceptable answer will be accepted)</p>	(Any 4)	(4)
	6.5.2	<ul style="list-style-type: none">• Ball valve. ✓		(1) [30]
			TOTAL SECTION B:	160
			GRAND TOTAL:	200