



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

AGRICULTURAL TECHNOLOGY

MEMORANDUM

NOVEMBER 2007

MARKS: 200

This memorandum consists of 9 pages.

SECTION A**QUESTION 1**

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

TOTAL SECTION A: 40

SECTION B**QUESTION 1**

- 1.1 1.1.1 a) Remove all resin catalyst and accelerator from skin. ✓ (4)
- b) Wear gloves if skin is sensitive. ✓
- c) Use acetone in well ventilated room. ✓
- d) Handle resin casting carefully, they are brittle. ✓
- * Glass fibre matting has small pieces of fibre that can
- * penetrate the skin or inhaled into your lungs.
- * Don't breath in fibreglass or get it in your eyes.
- * Catalyst and accelerator should always be kept separately.
- 1.1.2 It is a low viscosity fluid that can be transformed to a tough flexible solid✓by adding a hardening agent. ✓ (2)
- 1.1.3 Catalyst✓ (1)
- 1.1.4 They can cause an explosive mixture. ✓ (1)
- 1.2 1.2.1 a) Heating to an acceptable temperature. ✓ (2)
- b) Cooling at a controlled temperature. ✓
- 1.2.2 Carbon. ✓ (1)

- 1.3 1.3.1 **UPVC** ✓ (1)
- 1.3.2 **Galvanized mild steel.** ✓ (1)
- 1.3.3 **UPVC** ✓ (1)
- 1.3.4 **Copper.** ✓ (1)
- 1.3.5 **Galvanized mild steel.** ✓ (1)
- 1.4 1.4.1 Front view. (5)



- 1.4.2 Measurements. (2)

(Any two)

Evaluate the proportion of the measurement. ✓✓

- 1.4.3 Material list. (2)

(Learner use own discretion)

Educator evaluates the strength and effectiveness of the material. ✓✓

- 1.4.4 Scale. (1)

± 1:20 ✓

- 1.4.5 a) **Weld the neck clamp onto the end of the cattle crush.** ✓ (2)
b) **Concrete the base of the clamp.** ✓

- 1.4.6 a) **Safer to use pipe because the animal can be injured by the corners of square tubing.** ✓ (2)
b) **Pipe is stronger than square tubing.** ✓

- 1.5 1.5.1 **Very good, if the correct welding rod are used** ✓ (5)
 1.5.2 **Reshapes with difficulty** ✓
 1.5.3 **Poor (Rusts easy)** ✓
 1.5.4 **Very durable (Does not bend/fracture easily)** ✓
 1.5.5 **Cheaper to manufacture** ✓

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QUESTION 2

- 2.1 2.1.1 a) **Pressure release valve.** ✓ (2)
 b) **Pressure control valve.** ✓
 2.1.2 a) **Overload protector.** ✓ (2)
 b) **Automatic earth leakage protector.** ✓
 2.1.3 **To protect the inhabitants against electrical shock that can occur.** ✓ (1)
 2.1.4 **Cold water enters at the bottom where it is heated. ✓ Hot water rises to the top of the geyser where it can exit.** ✓ (2)
 2.2 a) **Loose connections.** ✓ (3)
 b) **Damaged or cracked insulation.** ✓
 c) **Damaged wires.** ✓
 * **Faulty switches.**
 * **Joints in a bad condition.**
 2.3 2.3.1 **The machine draws too much amperes. ✓ The wire, which is designed for 15 amperes, will heat up ✓ and the circuit breaker will trip because of the overload.** ✓ (3)
 2.3.2 **Install a thicker wire.** ✓ (1)
 2.4 2.4.1 a) **Don't ever play the fool with compressed air. Compressed air is extremely dangerous.** ✓ (3)
 b) **Don't use compressed air to clean dust from your clothes or body.** ✓
 c) **Close tap of compressor after usage.** ✓
 2.4.2 a) **Look on the manufactures nameplate on the motor.** ✓ (3)
 b) **Determine if the cable that leads to the compressor has three or four wires.** ✓
 c) **If the cable that connects the compressor is connected to a three-point plug the current is single phase. If the cable is connected to an industrial four point plug then the current is three phase.** ✓

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QUESTION 3

- 3.1 3.1.1 a) **19mm. ✓** (2)
b) **To ensure a high enough pressure to the shower. ✓**
- 3.1.2 a) **Copper✓** (1)
b) **PVC✓(Polypro)** (1)
- 3.2 3.2.1 a) **Longitudinal shrinking✓** (4)
b) **Angular shrinking longitudinally✓**
c) **Angular shrinking✓**
d) **Lateral shrinking✓**
- 3.2.2 a) **Pre-setting. ✓** (4)
b) **Welding of patchwork. ✓**
c) **Clamping. ✓**
d) **Spot-welding. ✓**
- 3.2.3 **Heat the piece of steel to a red-hot color✓ and then cool it down slowly. ✓** (2)
- 3.3 3.3.1 **It is a welding process by means of which worn parts ✓ can be built up by padding with a wear resistant metal✓** (2)
- 3.3.2 a) **Area to be covered must be free of corrosion, grease or foreign substances by grinding it away. ✓** (5)
b) **Choose the correct welding rod for the specific type of friction that the part is going to be subjected too✓**
c) **Weld up the part until the desired thickness. ✓**
d) **Do not work at too high amperage. ✓**
e) **Use a longer arc. ✓**
- 3.3.3 a) **Metal against metal friction ✓** (4)
b) **Serious jolts or shocks of metal against rock ✓**
c) **Scraping plus jolts and shocks ✓**
d) **Serious scraping ✓**
- 3.4 3.4.1 **Leftward welding technique. ✓** (1)
- 3.4.2 **Used to weld mild steel sheet ✓ up to 5mm✓** (2)
- 3.4.3 **Oxy acetylene welding apparatus. ✓** (1)
- 3.5 3.5.1 a) **Strengthening with reinforcement. ✓ Place reinforcement rods in the cement wall to prevent shifting of the wall. ✓** (4)
b) **Thickness of the foundation. ✓The thickness of the foundation must correlate with the weight of the construction. ✓**
- 3.5.2 a) **Thickness of the supply pipes. ✓** (2)
b) **Height of the dam above the supply point. ✓**

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QUESTION 4

- 4.1 4.1.1 a) Drive belts. ✓ (3)
b) Gears. ✓
c) Drive shafts must. ✓
- 4.1.2 a) Must appear neat. ✓ (5)
b) Safeguard the equipment. ✓
c) Removed and replaced easily. ✓
d) Don't become loose. ✓
e) Weight saving. ✓
• Keep out all undesired matter.
• Must safeguard the person that uses the equipment.
- 4.2 4.2.1 a) When the tractor negotiates a bend all the wheels are (3)
momentarily turning about a common center. ✓
b) The outer wheel on the curve consequently tends to
rotate faster than the inner wheel. ✓
c) This means that the half axle shaft of the outer wheel
revolves faster than that of the inner wheel. ✓
* The difference in speed between these two axle shafts
causes the differential pinions to rotate round their
individual shafts.
* As these little shafts are mounted in the casing, which
in turn is connected to the crown wheel gear, they
revolve with it, but at the same time still drive the rear
wheels, in spite of the fact that they do not revolve at
the same speed.
- 4.2.2 Crown wheel. ✓ (1)
- 4.2.3 Universal joint. ✓ (1)
- 4.2.4 a) Changing direction of rotation. ✓ (3)
b) Speed reduction. ✓
c) Dividing rotational torque equally between the rear
wheels. ✓
- 4.2.5 a) Further reduction in speed. ✓ (2)
b) More torque. ✓
- 4.2.6 Diff lock. ✓ (1)
- 4.3 4.3.1 a) Driving power. ✓ (3)
b) Local availability of parts and service. ✓
c) Rigidity of construction. ✓
* Simplicity of control mechanisms.
* Driver comfort.
* Versatility.
* Proven reliability and durability.
- 4.3.2 All farm implements and tractor spares should comply with (2)
certain requirements ✓ like being interchangeable and easier to
handle. ✓

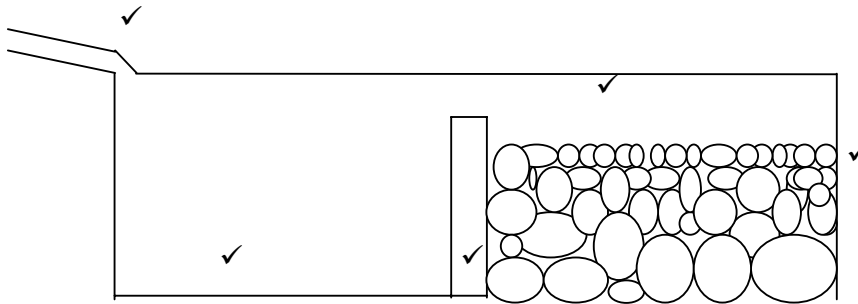
- 4.3.3 a) Any implement can be used on any tractor. ✓ (3)
 b) The same engine and spares can be used on a variety of tractors. ✓
 c) Spares can be purchased from any agent instead of a specific one. ✓
 * Spares can be offered to the farmer relatively cheap, because of mass production.
 * A reduced quantity of spares needs to be kept in stock for maintenance and service purposes.
 * When a farmer decides to purchase a new tractor, he will not have to take a special course on how to maintain it.
- 4.4 a) Engine drive needs to be disengaged when changing gears. ✓ (4)
 b) Drive should be disengaged when the tractor is started. ✓
 c) The clutch is disengaged to allow engine speed to increase and then engaged to give greater torque. ✓
 d) Allows the operator to stop the tractor, belt pulley or PTO shaft without stopping the engine. ✓
- 4.5 4.5.1 Double action hydraulic cylinder. ✓ (1)
 4.5.2 Provides forced movement ✓in both directions. ✓ (2)
 4.5.3 Can be used to provide movement to front loaders/back actors/ploughs/ graters/ planters that are mounted on the tractor. ✓ (1)
- 4.6 4.6.1 Pedestal drilling machine. ✓ (1)
 4.6.2 a) Drilling holes. ✓ (2)
 b) Sanding. ✓
 4.6.3 Chuck. ✓ (1)
 4.6.4 Hold the drill bit when drilling is done. ✓ (1)
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QUESTION 5

- 5.1 5.1.1 Power head. ✓ (2)
 Function is to pump water. ✓
 5.1.2 Belt drive or Flat-belt drive. ✓ (1)
 5.1.3 Clock wise. ✓ (1)

- 5.1.4 a) It is based on the principle of circulating water through the cooling system on the principle of hot water that rises to the top of a container. ✓ (3)
- b) 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 the engine to enter the radiator through the upper radiator hose into the header tank. ✓
- c) When use in a stationary engine a water tank can be used instead of a radiator.
- 5.2 5.2.1 **Electrical submersible pump. ✓** (1)
- 5.2.2 a) If motor is not 100% watertight it can be damaged. ✓ (2)
- b) Pump can only be driven by electricity. ✓
- 5.2.3 a) Purpose of pump. ✓ (4)
- b) Required delivery. ✓
- c) Water quality. ✓
- d) Type of power source available. ✓
- * Mobility of pump.
- * Simplicity of design.
- * Maintenance required.
- * Self-installation.
- 5.3 a) Very light. ✓ (5)
- b) Handle easily. ✓
- c) Coupling is simple. ✓
- d) Do not corrode or rust easily. ✓
- e) Can withstand high pressure. ✓
- 5.4 a) Pressure high enough to satisfy needs. ✓ (5)
- b) Prevent spillage. ✓
- c) Joints watertight. ✓
- d) Removal of spillage water. ✓
- e) Protect all valves. ✓
- 5.5 **Drain the water with a shallow furrow/pipe. ✓** (1)

5.6



Marks are allocated for the following:

5.6.1	Line work.	(1)
5.6.2	Scale	(1)
5.6.3	Neatness.	(1)
5.6.4	Design.	(1)
5.6.5	Correctness.	(1)
		[30]

TOTAL SECTION B: 160

GRAND TOTAL: 200

END