



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

NOVEMBER EXAMINATION

MAINTENANCE MANAGEMENT: FARMING N4

23 NOVEMBER 2016

This marking guideline consists of 7 pages.

QUESTION 1: GENERAL

1.1	1.1.1	B	(5 × 1)	(5)
	1.1.2	D		
	1.1.3	C		
	1.1.4	D		
	1.1.5	B		
1.2	1.2.1	D	(8 × 1)	(8)
	1.2.2	G		
	1.2.3	F		
	1.2.4	E		
	1.2.5	B		
	1.2.6	C		
	1.2.7	H		
	1.2.8	A		
1.3	1.3.1	Pulley gearing	(7 × 1)	(7)
	1.3.2	Lowering handles		
	1.3.3	Pillar/Column		
	1.3.4	Work table lock		
	1.3.5	Base		
	1.3.6	Work table		
	1.3.7	Chuck		
				[20]

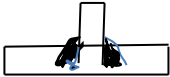
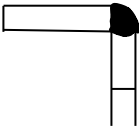
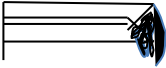
QUESTION 2: VEHICLES AND IMPLEMENTS

2.1	2.1.1	Cylinder block	(5 × 1)	(5)	
	2.1.2	Cylinder head			
	2.1.3	Piston			
	2.1.4	Crank shaft			
	2.1.5	Connecting rod			
2.2	• Crankshaft turns the camshaft. • Cam presses on the cam follower/tappet. • Tappet presses against the push rod. • Push rod presses against the valve rocker. • Rocker rotates on the rocker shaft. • Valve rocker presses against the valve stems and open the valve against the pressure of the valve spring. • When the cam moves away from the cam follower the valve spring closes the valve.			(Any 4 × 1)	(4)

- 2.3
- | FOUR-STROKE PETROL ENGINE | FOUR-STROKE DIESEL ENGINE |
|--|---|
| <ul style="list-style-type: none"> • Spark plugs • Mixture of air and fuel is drawn into the cylinder • The spark plug ignites the mixture of air and fuel • Weaker engine | <ul style="list-style-type: none"> • Fuel injectors • Only air is drawn in • Diesel is injected in air with high temperature • Engine is stronger |
- (4 × 1) (4)
- 2.4
- Quick transfer of heat to the air
 - Prevents the engine from overheating
 - Reduces excessive wear of components
 - Maximises engine fuel efficiency
 - Improves engine performance
 - Reduces air pollution
- (Any 3 × 1) (3)
- 2.5
- 2.5.1 The water or coolant is going to get used up and the cooling system will not work.✓ The engine will overheat and damage the cylinder head because there will be no water or coolant to absorb heat away from the engine where it is generated and take it to the radiator where it will go to the fins and be blown away by air from the fan.✓
- Mr Mtshali will have to spend money, which should have been used for other meaningful ventures on the farm, on repairing the engine. The tractors and trucks will stop functioning which will affect production. Workers such as drivers will lose their jobs if trucks and tractors are not working which will affect their families' lives.✓
- (3)
- 2.5.2
- Check the water in the radiator every morning.
 - Delegate maintenance personnel to check water every morning in all cars.
- (1)
- [20]**

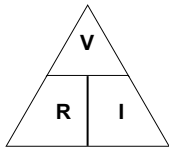
QUESTION 3: WELDING

- 3.1
- | MOTOR GENERATOR | TRANSFORMER |
|--|--|
| <ul style="list-style-type: none"> • Driven by any power (petrol, diesel or tractor) • Moving parts • Generates direct current • Big and heavy • Can weld nonferrous metals | <ul style="list-style-type: none"> • Uses transformer and coils • No moving parts • Generates alternating current • Small and easy to handle • Cannot weld nonferrous metal |
- (5 × 2) (10)

3.2	3.2.1			
	3.2.2			
	3.2.3			
	3.2.4			
	3.2.5			
			(5 × 1)	(5)
3.3	3.3.1	• No root gap • Root opening too small • Angle of V-groove of joint too small • Current too low		
	3.3.2	• High welding current • Arc length too long • Unstable arc • Improper shielding		
	3.3.3	• Moisture in the flux or on the base metal • Poor starting and finishing techniques		
	3.3.4	• Work position cause slag flooding • Incorrect electrode angle • Faulty cleaning before welding the next bead		
	3.3.5	Did not tack weld short run the joint together before welding	(5 × 1)	(5)
				[20]

QUESTION 4: ELECTRICITY

- 4.1 The formula which shows the relationship between voltage, current and resistance in the circuit.



$$V = R \times I$$

$$R = V/I$$

$$I = V/R$$

(5)

- 4.2
- 4.2.1 Resistance
- 4.2.2 Potential difference
- 4.2.3 Current
- 4.2.4 Power

(4 × 1)

(4)

- 4.3
- $$1/R_t = 1/R_1 + 1/R_2 + 1/R_3$$
- $$1/R = 1/5 + 1/12 + 1/20$$
- $$1/R = 12/60 + 5/60 + 3/60$$
- $$1/R = 20/60$$
- $$R/1 = 3/1$$
- $$R_t = 3$$

(5)

- 4.4
- Parallel
 - Components are independent, each have its own switch so when one component stops working others continue to work
 - All component get same voltage and lights produce same brightness
 - Components can be added without changing voltage
 - Simple, safe and reliable

(6)

[20]**QUESTION 5: BUILDING TECHNIQUES**

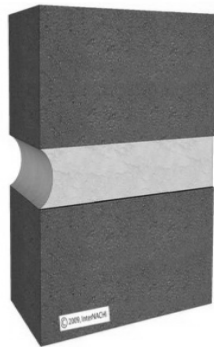
- 5.1
- Main barn
 - Storage
 - Grain room/Silo
 - Hay barn
 - Grain room
 - Feed lots

(Any 5 × 1)

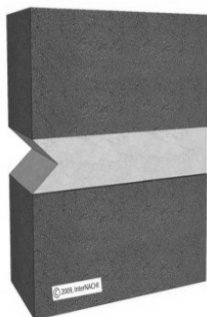
(5)

- 5.2
- Aggregate (sand and stone)
 - Concrete
 - Cement
 - Sand
 - Stone
 - Water
- (Any 5 × 1) (5)
- 5.3 1 : 3 : 6 (1)
- 5.4
- Mix on a large square board on a level area. Pour three parts of sand first. Make an opening in the middle in which the cement is poured.
 - Mix until the sand and cement is one colour.
 - Make an opening in the middle and add stone.
 - Mix until evenly distributed and add a little water at a time.
 - Mix thoroughly until it looks like lumpy porridge.
- (5)

5.1 5.5.1 Concave

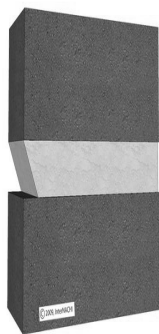


5.5.2 "V"



5.5.3

Struck



5.5.4

Flush



(4 × 1) (4)
[20]

TOTAL: 100