



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

N990(E)(16)H

NATIONAL CERTIFICATE

MAINTENANCE MANAGEMENT: FARMING N4

(4090524)

16 November 2018 (X-Paper)

09:00–12:00

Nonprogrammable calculators may be used.

This question paper consists of 7 pages.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
MAINTENANCE MANAGEMENT: FARMING N4
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Sketches and diagrams should be labelled and neatly done in pencil.
 5. Write neatly and legibly.
-

QUESTION 1

- 1.1 List FIVE general safety rules when working with electrical equipment and machines. (5)
- 1.2 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.
- 1.2.1 Which component is not part of the lubrication system?
- A oil
 - B sump
 - C pump
 - D battery
- 1.2.2 Which component is not part of the coolant-recovery system?
- A Piston
 - B Expansion tank
 - C Radiator cap
 - D Radiator
- 1.2.3 An unsafe action includes ...
- A unsafe construction or scaffolding.
 - B bad planning.
 - C to take risks.
 - D unsafe or bad housekeeping, dirty or slippery floors.
- 1.2.4 An unsafe condition includes ...
- A working in an unsafe position.
 - B working at an unsafe speed or manner.
 - C badly-lit workshops.
 - D working on machines while they are in operation.
- 1.2.5 Good housekeeping means ...
- A everyone needs to respect each other in the workshop.
 - B there must be a good relationship between worker and employer.
 - C tools and equipment can sometimes be in good working order.
 - D there should be a place for everything in the workshop, for example a table or desk.

1.2.6 The responsibility of the employer includes ...

- A ensuring that workers are always clean and neat at work.
- B ensuring that workers make use of their safety equipment.
- C reporting unsafe conditions and accidents.
- D ensuring and maintaining a safe workshop.

1.2.7 The responsibility of the employee includes ...

- A ensuring a safe work environment without hazards.
- B ensuring no toxic gasses are released into the air.
- C conveying information and instructions.
- D wearing safety and protective clothing.

1.2.8 These components are part of the cooling system:

- A Radiator, oil pump, expansion valve, thermometer
- B Refrigeration, water pump, expansion tank
- C Radiator, water pump, expansion tank, thermostat
- D Radiator, water pump, petrol tank, thermostat

1.2.9 These are examples of oil pumps:

- A Vane and gear oil pumps
- B Gear and spindle oil pumps
- C Vane and spindle oil pumps
- D Rotor and super duplex oil pumps

1.2.10 This is a high-voltage electric device for igniting the air-fuel mixture:

- A Ignition switch
- B Ignition coil
- C Condenser
- D Spark plug

(10 × 1) (10)
[15]

QUESTION 2

2.1 Explain the outlet/exhaust stroke of the four stroke petrol engine and make a neat fully labelled sketch of the outlet stroke to support your explanation.

(10 × 1) (10)

2.2 Explain the valve operation/movement by starting with the movement of the crankshaft turning the camshaft.

(6)

2.3 Make a neat labelled sketch of the 'cam lobe' indicating the lift of the lobe.

(2)

- 2.4 Study FIGURE 1 and label the different components of the engine. Write the answer next to the question number (A–H) in the ANSWER BOOK.

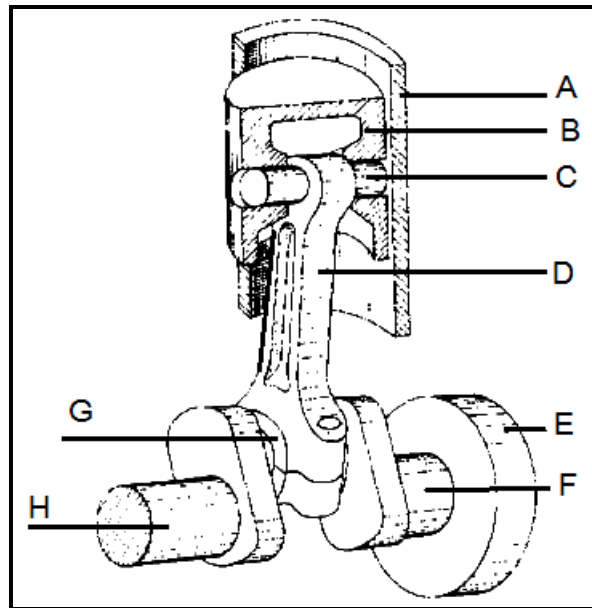


FIGURE 1

(8)
[26]

QUESTION 3

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write 'True' or 'False' next to the question number (3.1–3.7) in the ANSWER BOOK. Correct the statement if it is false.

- 3.1 A dumping site does not have to be fenced.
- 3.2 It is the responsibility of the employee to organise safety courses.
- 3.3 The National Environmental Management: Waste Act (No. 59 of 2008) aims to prevent pollution and ecological degradation.
- 3.4 Long-term water pollution may cause serious illness and finally death to humans.
- 3.5 Flammable gas and non-flammable gas cylinders should be stored separately.
- 3.6 Persons should be allowed to ride in the bucket of loaders as long as they adhere to all safety regulations.
- 3.7 Safety guards should always be in place when operating any piece of machinery.

[10]

QUESTION 4

- 4.1 Name TWO reasons why it is important to use welding gloves when welding. (2)
- 4.2 Make a neat labelled drawing showing how you will counteract the defect of buckling, bending or twisting of a welded joint. (6)
- 4.3 Name the TWO types of currents in which welding can be done. (2)
- 4.4 After welding a work piece, you realise the work piece started to buckle and bend.

What is the cause of internal stress inside the welded joint?

(4)
[14]

QUESTION 5

- 5.1 A water pump is driven by an electrical motor. The motor draws a current of 10 A connected to 230 V. The cost per unit is R3.00 and the pump is operational for 3 hours per day for a 30-day month.

Calculate the following:

- 5.1.1 The total power consumption of the electrical motor in kW.
- 5.1.2 The total operational cost of the pump per month. (2 × 3) (6)
- 5.2 Explain electro-magnetic induction in relation to the electric motor. (6)
- 5.3 You assume there is a problem with the coils inside the electrical motor.

Explain the safety regulations when measuring the resistance of the starter and running coils.

(3)
[15]

QUESTION 6

- 6.1 On a setting-out drawing the scale is 1:100.

Answer the following questions:

- 6.1.1 How many metres on the ground will 50 mm on the drawing represent?
- 6.1.2 How many millimetres (mm) on a drawing will 6,2 meters represent on the ground?

(2 × 2) (4)

6.2 Choose the correct word(s) from those given in brackets. Write only the word(s) next to the question number (6.2.1–6.2.8) in the ANSWER BOOK.

6.2.1 The more water used the (weaker/stronger) the concrete will become.

6.2.2 Larger-sized stones require the (smallest quantities/most) sand and cement.

6.2.3 During the cold weather the curing period for concrete should be (lengthened/shortened).

6.2.4 Galvanised ties (should/should not) be placed over vertical joints.

6.2.5 Two bricks knocked together should give off a (ringing/dull) sound.

6.2.6 Face bricks are normally used for (cavity walls/half-brick walls).

6.2.7 Concrete blocks (should not/should) be moistened before they are laid.

6.2.8 Timber mainly used for roof timbers are (soft wood/hard wood). (8 × 1) (8)

6.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write 'True' or 'False' next to the question number (6.3.1-6.3.8) in the ANSWER BOOK.

6.3.1 Specifications must be set to a standard to catch out the building contractor.

6.3.2 A suitable building site must have a slant or slope of at least 2% to the North.

6.3.3 The wind does not play a role when buildings are placed or grouped.

6.3.4 If the ground is of good quality the foundations can be smaller than indicated on the drawings.

6.3.5 Building sand can contain salt if the salt content is lower than 8%.

6.3.6 Concrete must be placed within one hour after mixing.

6.3.7 A door is right hung when the door opens to the left.

6.3.8 The door frame will be built in with the first layer of bricks. (8 × 1) (8)
[20]

TOTAL: 100