



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

MAINTENANCE MANAGEMENT: FARMING N4

(4090524)

**22 October 2020 (X-paper)
09:00–12:00**

Nonprogrammable calculators may be used.

This question paper consists of 11 pages.

291Q1B2022

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. Start each section on a new page.
 5. Use only a black or blue pen.
 6. Write neatly and legibly.
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QUESTION 1

1.1 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 (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 Used to loosen and tighten bolts and nuts of less torque:

- A Power bar
- B Open and ring-end spanner
- C Sliding handle
- D Water pump pliers



1.1.2 Used to loosen and tighten bolts and nuts with considerably more torque:

- A Hacksaw
- B Tin snip
- C Engineering pliers
- D Ring spanner

1.1.3 Used to scribe right angles and parallel lines and to measure angles:

- A Pin punch
- B Chisels
- C Combination square set
- D Stock die



1.1.4 A heavy-duty hammer:

- A Ball-pein hammer
- B Club hammer
- C Rubber hammer
- D Shifting spanner

1.1.5 A multipurpose adjustable wrench for bolts and nuts:

- A Shifting spanner
- B Valve-spring compressor
- C Piston ring expander
- D Pipe wrench



1.1.6 Used to clamp piston rings into piston grooves:

- A Valve-spring compressor
- B Cylinder hone
- C Piston ring compressor
- D Thread gauge

1.1.7 Used to expand piston rings to be fitted on the engine piston:

- A Valve-spring compressor
- B Cylinder hone
- C Piston ring compressor
- D Piston ring expander

1.1.8 Used to smooth out the thread effect caused by a rebore cutting tool:

- A Speed handle
- B Cylinder hone
- C Allen keys
- D Piston ring expander



1.1.9 Used to remove gears, seals, pulleys and other components:

- A Tap holder
- B Pullers
- C Vernier
- D Trolley jack

1.1.10 Used to lift heavy equipment, parts or machinery:

- A Trestle
- B Micrometer
- C Block and tackle
- D Pullers



(10 × 1) (10)

1.2 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.2.1–1.2.5) in the ANSWER BOOK.

1.2.1 The hand drilling machine might have a reverse action to loosen screws or small nuts/bolts.

1.2.2 The pedestal drill machine uses sleeves to use tapered shank drills.



1.2.3 The bench grinder can be held at angles to cut different profile steel sections.

1.2.4 The grinding wheel dresser (dressing tool) can also sharpen drill bits.

1.2.5 The tool rest on the bench grinder should not be more than 3 mm set from the stone.

(5 × 1) (5)

1.3

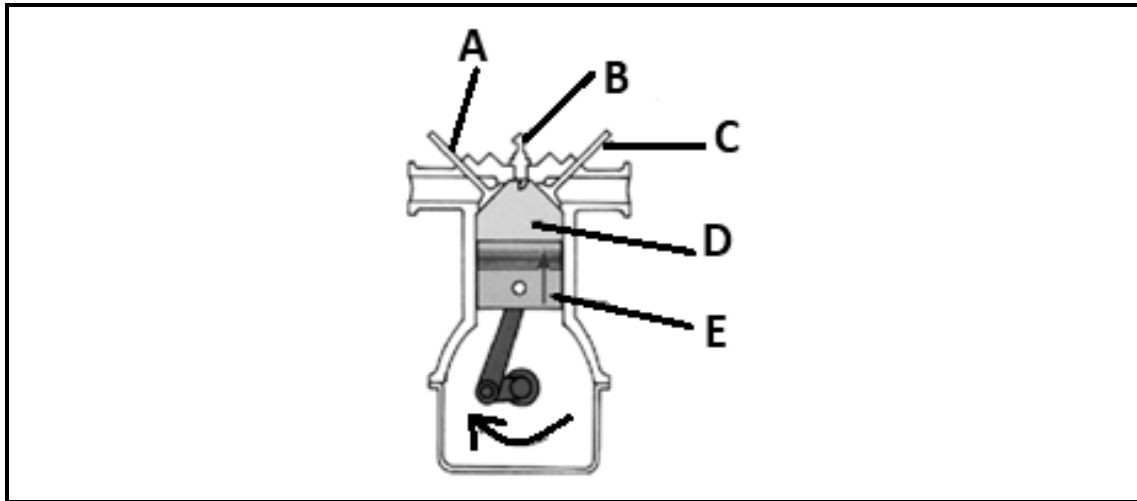
[Source: www.google/images.co.za]

- 1.3.1 Label the parts by writing only the answer next to the letter (A–C) in the ANSWER BOOK. (3 × 1) (3)
- 1.3.2 Explain TWO safety rules applicable to part B. (2) [20]

QUESTION 2

- 2.1 Explain each of the following mechanical factors that relates to a four-stroke internal-combustion engine:
- 2.1.1 Pressure
- 2.1.2 Friction
- 2.1.3 Heat
- 2.1.4 Expansion
- 2.1.5 Wear
- (5 × 2) (10)

2.2

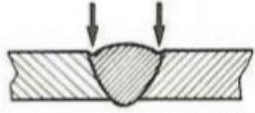
[Source: www.google/images.co.za]

- 2.2.1 Label the parts by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)
- 2.2.2 Explain the stroke cycle shown in the picture. (3)
- 2.2.3 How many degrees did the crankshaft rotate to reach this stroke? (1)
- 2.2.4 Name the stroke cycle shown in the picture. (1)

- 2.3 Give FIVE guidelines to inspect the cooling system of a four-stroke internal-combustion engine. (5)
- [25]

QUESTION 3

- 3.1 Choose a term from COLUMN B that matches a welding defect shown in COLUMN A. Write only the letter (A–F) next to the question number (3.1.1–3.1.6) in the ANSWER BOOK.

COLUMN A	COLUMN B
3.1.1 	A lack of penetration B slag inclusions C cracks D undercut E porosity F lack of fusion
3.1.2 	
3.1.3 	
3.1.4 	
3.1.5 	
3.1.6 	

(6 × 1)

(6)

- 3.2 Complete the following sentences by writing only the missing word or words next to the question number (3.2.1–3.2.5) in the ANSWER BOOK.

3.2.1 The ... Health and Safety Act (OHS Act) regulates health and safety in a workshop.

3.2.2 Two responsibilities of the ... are to provide safety equipment and a safe workplace.



3.2.3 Two responsibilities of the ... are to wear safety equipment and keep the workplace neat and tidy.

3.2.4 Leather ... protect hands against heat and arc rays during SMAW.

3.2.5 Leather ... protect safety boots against sparks and hot metal during SMAW.



(5 × 1)

(5)

- 3.3 List FOUR factors affecting the weldability of steel.

(4)

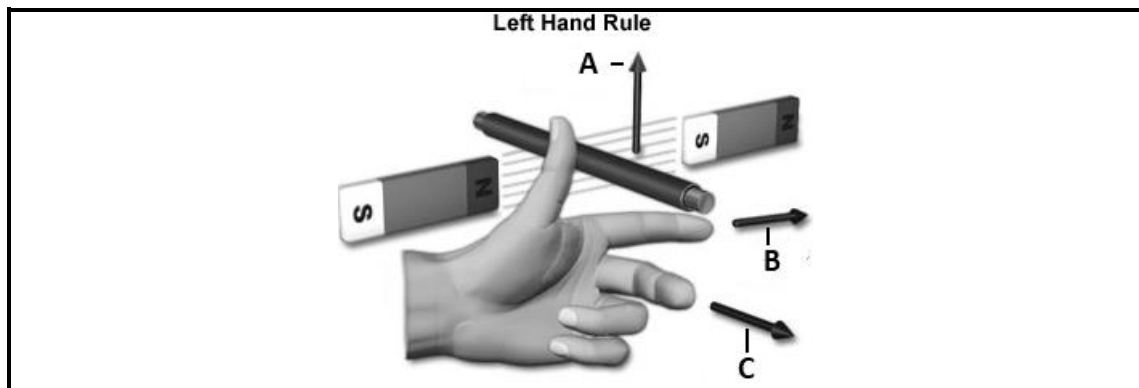
[15]

QUESTION 4

- 4.1 Name the act that governs the control of waste on a farm. (2)
- 4.2 List FOUR steps contained in a policy on waste control on a farm. (4)
- 4.3 Give FOUR types of agricultural waste on a farm. (4)

**[10]****QUESTION 5**

5.1

[Source: www.google/images.co.za]

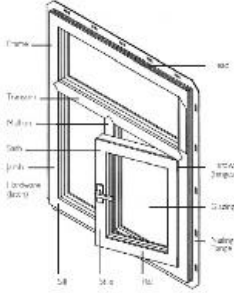
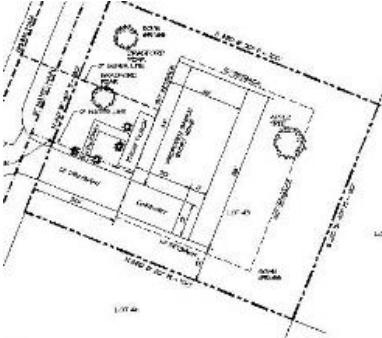
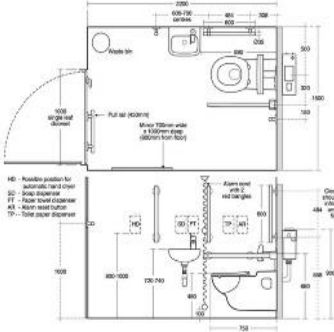
Label the sketch by writing only the answer next to the letter (A–C) in the ANSWER BOOK. (3 × 1)

- 5.2 Explain the phenomenon called *electromagnetic induction*. (3)
- 5.3 List FOUR factors on which the strength of the induced current inside a conductor depends. (4)

[10]

QUESTION 6

6.1 Choose a term from COLUMN B that matches a picture in COLUMN A. Write only the letter (A–F) next to the question number (6.1.1–6.1.4) in the ANSWER BOOK.

COLUMN A	COLUMN B
6.1.1 	A locality plan B site plan  C setting-out drawing D component drawing E detail drawing F sectional drawing
6.1.2 	
6.1.3 	
6.1.4 	

(4 × 1) (4)

6.2 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (6.2.1–6.2.5) in the ANSWER BOOK.

6.2.1 The homestead should be located near an access road but not so near that dust and noise become a problem.



6.2.2 The farmhouse should face north and be the first building to see when entering a farm.

6.2.3 Buildings on a farm that may cause unpleasant odours, flies or noise must, according to regulations, be situated near the homestead, working and living quarters, taking into consideration the prevailing winds.



6.2.4 Buildings or work areas where supervision of labour is required should rather not be visible from the farm office.

6.2.5 Wind directions are not very important when setting out a farm stall.

(5 × 1) (5)

6.3 Complete the following sentences by writing only the missing word or words next to the question number (6.3.1–6.3.5) in the ANSWER BOOK.

6.3.1 Cement is supplied in sacks of ... kg, but can also be supplied in small silos near big building sites.



6.3.2 Building sand must be free from dust, ... , salt or organic material.

6.3.3 The ... possible size of stone should be used when mixing concrete.

6.3.4 The ... water used the weaker the concrete will be.

6.3.5 Do not mix more concrete that can be placed within ... minutes.

(5 × 1) (5)

- 6.4 Choose a term from COLUMN B that matches a welding description in COLUMN A. Write only the letter (A–I) next to the question number (6.4.1–6.4.6) in the ANSWER BOOK.

COLUMN A		COLUMN B	
6.4.1	Wall as wide as the width of a single brick 	A	lap
6.4.2	Wall as wide as the length of a single brick	B	cavity wall
6.4.3	Two rows of bricks in stretcher bond with an opening of 50 mm between them	C	jointing
6.4.4	Distance that a brick, within a row, overtakes the vertical joints in the rows above	D	half-brick wall
6.4.5	Mixture of cement, sand and water	E	bond
6.4.6	Pushing of mortar in between joints	F	mortar
		G	junctions 
		H	concrete
		I	one-brick wall

(6 × 1)

(6)
[20]**TOTAL: 100**