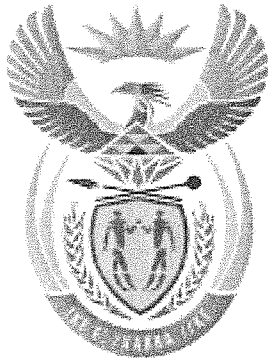
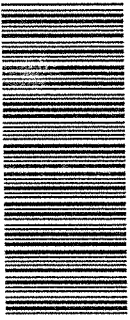


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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

**N940(E)(J7)H
JUNE EXAMINATION**

NATIONAL CERTIFICATE

MAINTENANCE MANAGEMENT: FARMING N4

(4090524)

**7 June 2013 (X-Paper)
09:00–12:00**

This question paper consists of 12 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 neatly done in pencil.
 5. Use only ONE ANSWER BOOK for both sections.
 6. Write neatly and legibly.
-

SECTION A: MOTOR MECHANICS**QUESTION 1: GENERAL**

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 Which component is not part of the spark-ignition system?
- A Battery
 - B Ignition coil
 - C Ignition points
 - D Ignition injector
- 1.1.2 The dwell angle is referring to the following statement:
- A The opening and closing of the breaker points
 - B The amount of teeth on the camshaft drive sprocket
 - C The relation between the crankshaft sprocket and camshaft sprocket
 - D The vacuum advance is directly dependable on the dwell angle
- 1.1.3 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.
- 1.1.4 An unsafe condition includes ...
- A to work in an unsafe position.
 - B to work at an unsafe speed or manner.
 - C badly-lit workshops.
 - D to work on machines while in operation.
- 1.1.5 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 should always be in good working order.
 - D there should be a place for everything in the workshop, for example a table or desk.
- 1.1.6 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 maintain a safe workshop.

- 1.1.7 The responsibility of the employee includes ...
- A ensuring a safe work environment without hazards.
 - B ensuring no toxic gasses get released into the air.
 - C conveying information and instructions.
 - D wearing safety and protective clothing.
- 1.1.8 This circuit includes all of the components and wires operating on low voltage.
- A Secondary circuit
 - B High-tension circuit
 - C Primary circuit
 - D Low-pressure injection circuit
- 1.1.9 This component also serves as a voltage regulator in the electric system.
- A Battery
 - B Ignition coil
 - C Spark plug
 - D Rotor
- 1.1.10 It is a high-voltage electric device for igniting the air-fuel mixture.
- A Ignition switch
 - B Ignition coil
 - C Condensor
 - D Spark plug

(10 × 1) (10)

- 1.2 Choose a description from COLUMN B that matches a/an word/item in COLUMN A. Write only the letter (A–J) next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

COLUMN A		COLUMN B
1.2.1	Two-post hoist	A provides the wheels with constant turning motion or force through the driving system
1.2.2	Four-post hoist	
1.2.3	Ring squeezer	B links the crankshaft and the camshaft
1.2.4	Trestles	C serves as a lever to open the valve
1.2.5	Bearing puller	D allows the air/fuel mixture to enter the cylinder
1.2.6	Cylinder block	E used to remove a gear from the shaft
1.2.7	Rocker	F it holds the pistons
1.2.8	Inlet valve	G used to insert the piston in the cylinder
1.2.9	Crankshaft	H used to support the car when a person is working under it
1.2.10	Timing chain/gear	I used when the car's wheels are removed
		J sometimes used to perform wheel alignment procedures

(10 × 1)

(10)
[20]

QUESTION 2: ENGINE OPERATION

- 2.1 Between which TWO points is the stroke of an engine measured? (2)
- 2.2 Name, in correct sequence, the FOUR strokes of a four-stroke spark-ignition internal combustion engine. (4)
- 2.3 Indicate whether the following statements are PETROL ENGINE or DIESEL ENGINE related. Choose the answer and write only 'petrol engine' or 'diesel engine' next to the question number (2.3.1–2.3.4) in the ANSWER BOOK.
- 2.3.1 Uses a carburettor. (1)
- 2.3.2 The air/petrol mixture is compressed during the compression stroke (1)
- 2.3.3 The combustion chamber is relatively smaller. (1)
- 2.3.4 This engine uses an injector as part of the ignition system. (1)
- [10]**

QUESTION 3: COOLING

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 (3.1–3.5) in the ANSWER BOOK.

- 3.1 The component which ensures rapid warm-up when starting an engine from cold:
- A Radiator
 - B Thermostat
 - C Pressure cap
 - D Water pump
- 3.2 Antifreeze ...
- A causes corrosion.
 - B is a corrosion inhibitor.
 - C is an active electrolyte.
 - D must never be replaced.
- 3.3 A piece of equipment used to check the coolant percentages is the ...
- A pressure tester.
 - B chemical tester.
 - C hydrometer.
 - D multimeter.

3.4 Which ONE of the following four combinations are the THREE methods of heat transfer?

- A Radiation, warmth, convection
- B Convection, radiation, conduction
- C Conduction, light, radiation
- D Induction, capacity, radiation

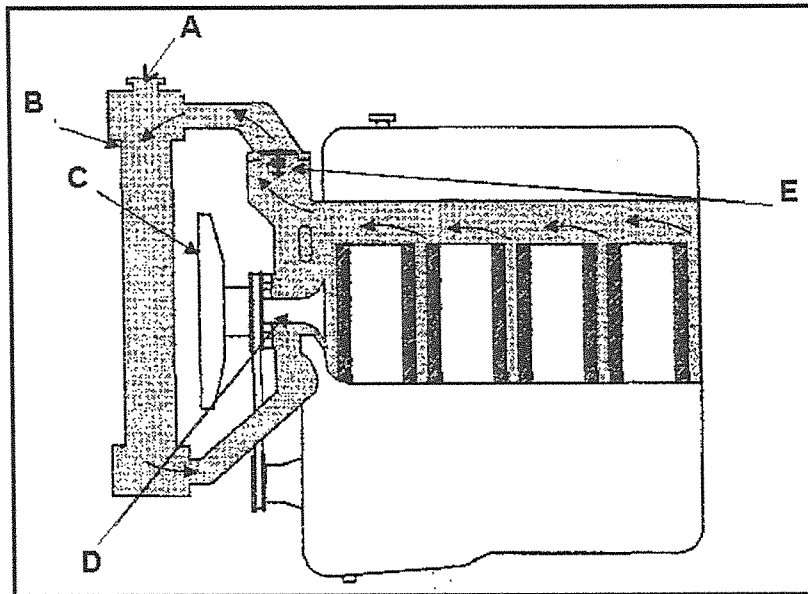
3.5 A pressurised cooling system ...

- A lowers the boiling point.
- B raises the boiling point.
- C maintains the boiling point.
- D never changes the boiling point.

(5 × 1)

(5)

3.6 Label the components of the cooling system. Write only the answer next to the letter (A–E) in the ANSWER BOOK.

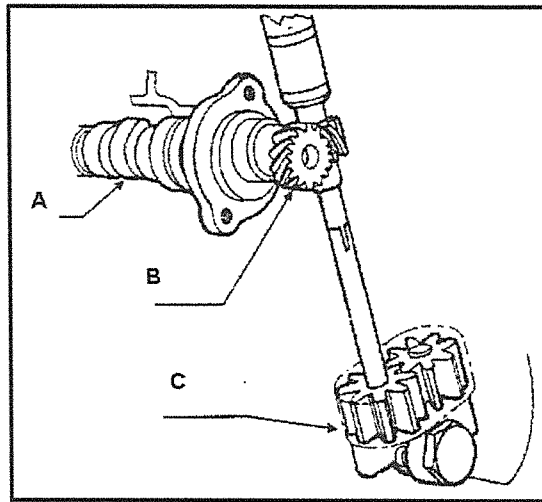


(5 × 1)

(5)
[10]

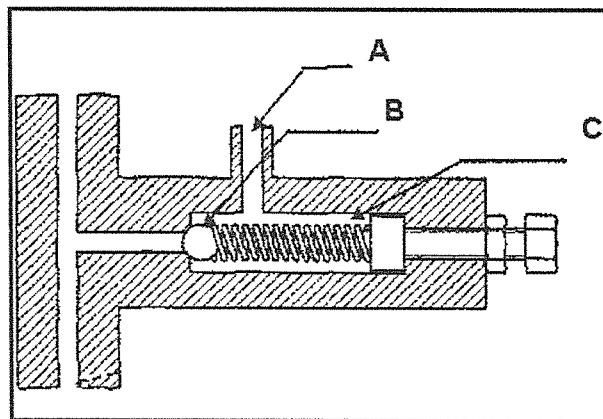
QUESTION 4: LUBRICATION

- 4.1 Name TWO types of oil pumps as used on engines. (2)
- 4.2 State the function of the oil pump in the engine. (2)
- 4.3 Label the components of the oil pump drive. Write only the answer next to the letter (A–C) in the ANSWER BOOK.



(3 × 1) (3)

- 4.4 Label the components of the oil-pressure relief valve. Write only the answer next to the letter (A–C) in the ANSWER BOOK.



(3 × 1) (3)
[10]

TOTAL SECTION A: 50

SECTION B: BUILDING, WELDING AND ELECTRICAL POWER TOOLS**QUESTION 5: GENERAL**

- 5.1 Choose a description from COLUMN B that matches a/an word/item in COLUMN A. Write only the letter (A–E) next to the question number (5.1.1–5.1.4) in the ANSWER BOOK.

COLUMN A		COLUMN B	
5.1.1	Situation plan	A	the most important drawing, showing the general construction
5.1.2	Site plan	B	some detail of the building
5.1.3	Setting-out drawing	C	the project with wider region, roads, farm borders and other buildings
5.1.4	Component drawing	D	showing the different buildings of the project
		E	the municipal drawing

(4 × 1)

(4)

- 5.2 Name THREE site limitations often encountered at building sites. (3)

- 5.3 Name THREE safety precautions when working with an angle grinder. (3)

- 5.4 Name TWO safety precautions concerning the work-piece rest on the bench grinder. (2)

- 5.5 Why should excessive force on the cutting/grinding disc of an angle grinder be avoided? (2)

- 5.6 Indicate whether the following statements are applicable to an ALTERNATING-CURRENT WELDING MACHINE or a DIRECT-CURRENT WELDING MACHINE. Choose the answer and write only 'alternating current' or 'direct current' next to the question number (5.6.1–5.6.4) in the ANSWER BOOK.

5.6.1 Can be used outdoors and is oil-cooled

5.6.2 The polarity can be adjusted.

5.6.3 More moving parts and needs more maintenance.

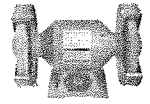
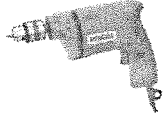
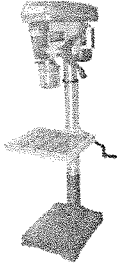
5.6.4 Uses only covered electrodes. (4 × 1) (4)

- 5.7 State TWO advantages of using jigs. (2)

[20]

QUESTION 6: ELECTRICAL POWER TOOLS

- 6.1 Choose a description from COLUMN B that matches a/an word/item in COLUMN A. Write only the letter (A–D) next to the question number (6.1.1–6.1.4) in the ANSWER BOOK.

	COLUMN A	COLUMN B
6.1.1	Hand drill machine	A 
6.1.2	Pedestal drill	B 
6.1.3	Bench grinder	C 
6.1.4	Angle grinder	D 

(4 × 1)

(4)

- 6.2 How would you do the sound test to check if a grinding wheel is defective or not?

(5)

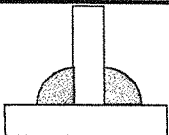
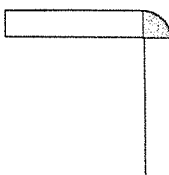
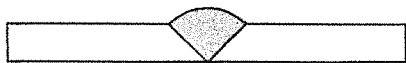
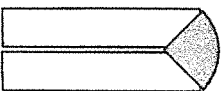
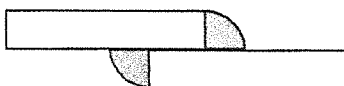
- 6.3 Which component of a pedestal drill is used to hold a taper drill bit?

(1)

[10]

QUESTION 7: SHIELDED METAL ARC WELDING

- 7.1 Choose a description from COLUMN B that matches a/an word/item in COLUMN A. Write only the letter (A–E) next to the question number (7.1.1–7.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
7.1.1	Single-V-butt-joint	A	
7.1.2	Lap-joint	B	
7.1.3	Edge-joint	C	
7.1.4	Corner-joint	D	
7.1.5	T-joint	E	

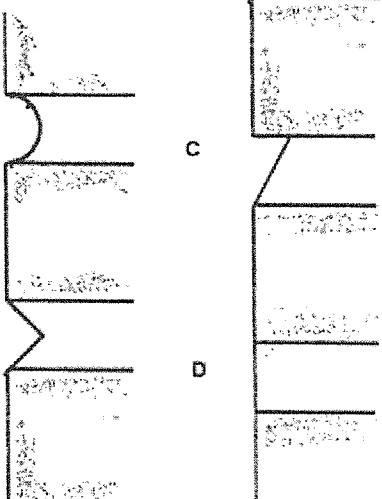
(5 × 1) (5)

- 7.2 Name FOUR common welding defects in butt-joints, due to poor welding habits. (4)

- 7.3 The flux around the electrode gives off a shielding gas when melting. Name the gas. (1)
[10]

QUESTION 8: BUILDING

- 8.1 On a building plan to scale 1 : 100, how many metres are represented on the ground with 75 mm on the plan? (2)
- 8.2 Explain the term *jointing* and also state at which type of walls it will normally be used. (4)
- 8.3 Choose a picture from COLUMN B that matches a word in COLUMN A. Write only the letter (A–D) next to the question number (8.3.1–8.3.4) in the ANSWER BOOK.

COLUMN A		COLUMN B	
8.3.1	V-joint		
8.3.2	Trowel-joint		
8.3.3	Flush-joint		
8.3.4	Concave-joint		

(4 × 1) (4)
[10]

TOTAL SECTION B: 50
GRAND TOTAL: 100