basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

AGRICULTURAL TECHNOLOGY

MAY/JUNE 2026

MARKS: 200

TIME: 3 hours

This question paper consists of 18 pages.

Copyright reserved

INSTRUCTIONS AND INFORMATION

1. GENERAL INSTRUCTIONS AND INFORMATION

    1.1 This question paper consists of TWO sections, namely SECTION A and SECTION B.

    1.2 BOTH sections are COMPULSORY.

    1.3 Answer ALL the questions in the ANSWER BOOK.

    1.4 Number the answers correctly according to the numbering system used in this question paper.

    1.5 You may use a non-programmable calculator.

    1.6 Show ALL calculations.

    1.7 Write neatly and legibly.

2. SECTION A: SHORT QUESTIONS

    2.1 This section consists of THREE questions.

    2.2 Follow the instructions when answering the questions.

3. SECTION B: STRUCTURED LONG QUESTIONS

    3.1 This section consists of FIVE questions.

    3.2 Start EACH question on a NEW page.

SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, e.g. 1.1.11 D.

1.1.1 Which ONE of the following is NOT a preventative action when working with implements hitched to a tractor?

A Install tractor rollover protection.
B Make sure that shields and guards are in place.
C Apply grease to a power take-off shaft while it is turning.
D Make sure that all the implements are hitched properly.

1.1.2 Tractor roll-overs are often caused by …

A turning right at a stop street.
B driving on gravel roads.
C working on a steep hill.
D carrying loads too low on the front-end loader.

1.1.3 You must first open the valve of the … cylinder when you want to use the MIG welding machine.

A oxygen
B argon
C acetylene
D compressed-air

1.1.4 … is used to generate electricity where a strong water current is available.

A Wind
B Solar power
C A nuclear power station
D A hydro-electric power station

1.1.5 Which ONE of the following is NOT recommended when you want to improve the cohesion properties of an adhesive?

A Apply a thick layer of adhesive if the surface is very porous.
B Apply a thick layer of adhesive between the areas to be joined.
C The molecules of the adhesive must stick to both surfaces.
D Apply adhesive to both surfaces.

1.1.6 The contact tip of a MIG welding torch that guides the welding wire is made of …

A copper.
B aluminium.
C steel.
D brass.

1.1.7 What is the drive ratio of a pulley assembly if the drive pulley has a diameter of Ø 240 mm and the driven pulley has a diameter of Ø 80 mm?

A 1 : 3
B 2 : 8
C 3 : 1
D 4 : 2

1.1.8 The combine harvester uses blowers, hammers and … to separate the grain from the chaff.

A augers
B blades
C sieves
D sickles

1.1.9 … is a by-product of running engines and can be very harmful to people.

A Carbon monoxide
B Nitrogen
C Hydrogen
D Methane

1.1.10 According to the Road Traffic Act, 1989 (Act 29 of 1989), all farm trailers must be equipped with … to the sides and back to make them more visible to other road users at night.

A yellow reflector tape
B red reflectors
C yellow paint
D red triangles (10 x 2) (20)

1.2 Change the underlined word(s) in each of the following statements to make the statements TRUE. Write only the appropriate word(s) next to the question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK, e.g. 1.2.6 Tractor.

1.2.1 The portable sprinkler irrigation system is ideal for using when irrigating a large circular field of cotton because of its low labour requirements and the ability to irrigate a large area effectively.

1.2.2 The slip clutch facilitates the power take-off shaft to operate at an angle.

1.2.3 The hopper of the hammer mill determines the size of the final grounded product.

1.2.4 A laser is a modern technological device that farmers use to determine a specific location on the farm.

1.2.5 Electroplating is the process where a steel product is covered with a zinc coating. (5 x 2) (10)

1.3 Choose a word/term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–H) next to the question numbers (1.3.1 to 1.3.5) in the ANSWER BOOK, e.g. 1.3.6 K.

COLUMN A		COLUMN B	
1.3.1	Material used to manufacture the drawbar pin of a tractor	A	copper
1.3.2	Material that is used to manufacture heavy tractor engine blocks	B	high-tensile steel
1.3.3	Material that is used to manufacture freeze-resistant water taps for dairies	C	brass
1.3.4	Material used to manufacture centre-pivot irrigation pipes because it is lightweight and resistant to corrosion	D	aluminium
1.3.5	Material used to manufacture milk tanks due to its hygienic properties	E	PVC
		F	stainless steel
		G	cast iron
		H	bronze

(5 x 2) (10)

TOTAL SECTION A: 40

SECTION B

QUESTION 2: MATERIALS AND STRUCTURES

Start this question on a NEW page.

2.1 The following questions are applicable to different metals that are used on a farm in various manufacturing processes.

2.1.1 Name a suitable alloy element that can be added to stainless steel to give it a fair amount of toughness at low temperatures. (1)

2.1.2 What is the percentage of copper and zinc in brass? (2)

2.1.3 Explain how the internal stress in brass is relieved without losing its properties. (4)

2.1.4 Under which circumstances will you use bronze hammers? Explain why this is necessary. (2)

2.1.5 Explain why bronze wool is preferred to steel wool for woodworking applications. (1)

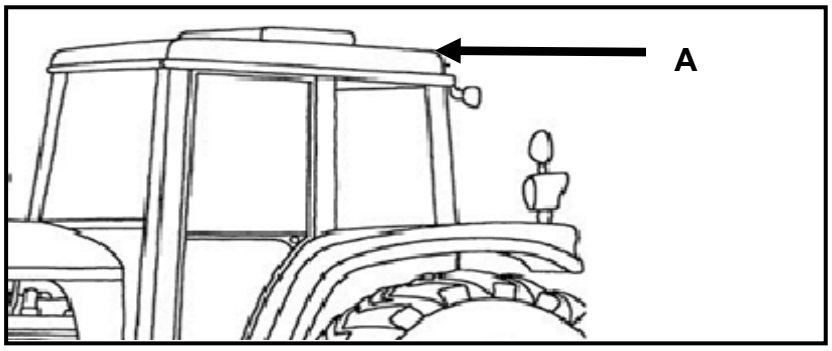
2.2 Study the picture below of a silicon-based adhesive that can be used on a farm and answer the questions that follow.



2.2.1 Name TWO properties of an adhesive. (2)

2.2.2 State TWO ways to improve the cohesion properties of this silicon. (2)

2.3 Study the picture of a tractor cab and answer the questions that follow.



2.3.1 Give TWO reasons why fibreglass would be used instead of metal for the manufacturing of part **A** of the cab. (2)

2.3.2 Name TWO precautionary measures to follow when working with fibreglass. (2)

2.3.3 The cab of the tractor was accidently damaged. State the steps to follow when repairing the crack in the fibreglass cab. (3)

2.4 The use of synthetic materials on the farm has increased rapidly in the past ten years.

2.4.1 Give TWO reasons for the use of Vesconite rather than white metal when manufacturing bushes. (2)

2.4.2 Explain why Vesconite is safe to use in the manufacturing industry. (3)

2.4.3 Describe TWO electrical properties of Teflon. (2)

2.4.4 Give THREE reasons why Vesconite is the best material for the manufacturing of bushes. (3)

2.5 The picture below shows a component used in an electric fence.



2.5.1 Identify the component shown in the picture above. (1)

2.5.2 Name TWO suitable materials from which this component can be manufactured. (2)

2.5.3 State ONE property of the materials named in QUESTION 2.5.2. (1)
[35]

QUESTION 3: ENERGY

Start this question on a NEW page.

3.1 The picture below shows a wind turbine.



3.1.1 Name TWO factors to consider before installing a wind turbine. (2)

3.1.2 Tabulate TWO advantages and TWO disadvantages of wind turbines. (4)

3.1.3 Can the energy produced from this turbine be used during windless days? Motivate your answer. (2)

3.2 Briefly discuss the manufacturing process of biodiesel. (2)

3.3 Name TWO plants from which ethanol can be made. (2)

3.4 The solar hot-water system shown below is used to heat water without using electricity. Study the picture and answer the questions that follow.



3.4.1 Explain what is meant by *solar power*. (2)

3.4.2 Describe the working of the solar hot-water system shown above. (4)

3.4.3 Give TWO reasons why a solar hot-water system is regarded as a popular choice to heat water. (2)

[20]

QUESTION 4: SKILLS AND CONSTRUCTION PROCESSES

Start this question on a NEW page.

4.1 The picture below shows an earth clamp used on a MIG welding machine.

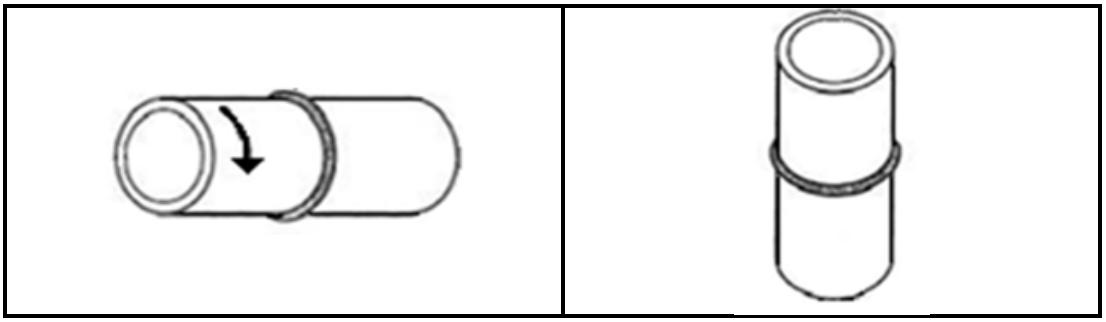


4.1.1 Name the TWO surfaces to which the earth clamp can be attached to complete the welding circuit. (2)

4.1.2 Name TWO factors that can cause a lack of contact between the welding clamp and the work piece. (2)

4.1.3 Name TWO important factors that should be remembered when welding thinner metals with the MIG welding machine. (2)

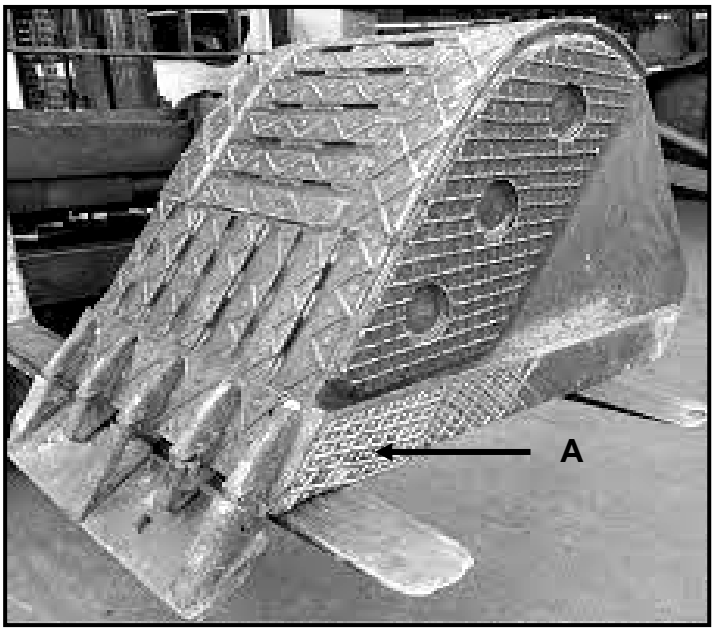
4.2 Name the following pipe-welding positions, as shown in pictures **A** and **B**.



A **B** (2)

4.3 Describe the overhead arc-welding position. (4)

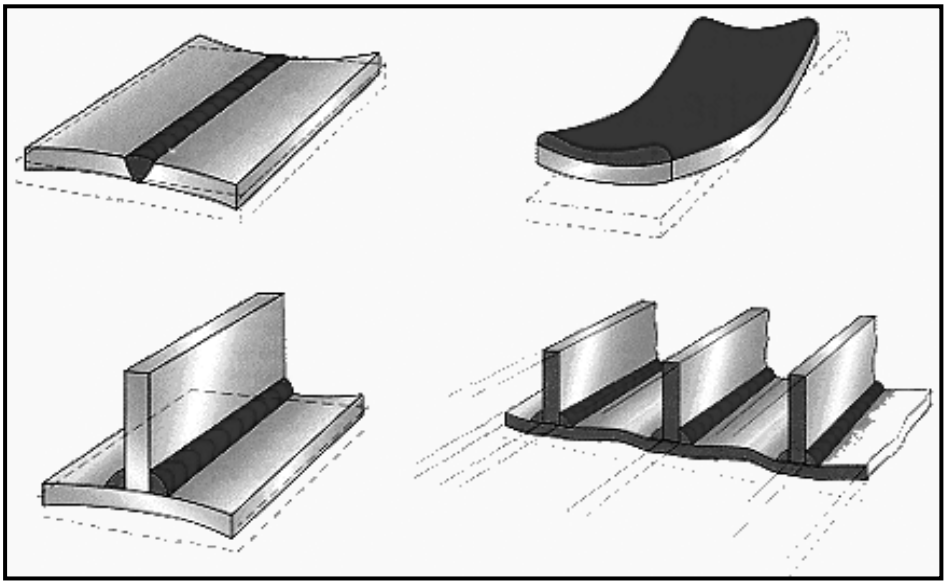
4.4 The picture below shows the bucket of a front-end loader used on a farm to do soil excavation.



4.4.1 Identify the welding process shown by arrow **A**. (1)

4.4.2 Name THREE steps that must be followed by the welding operator to prepare the welding surface before the welding process starts. (3)

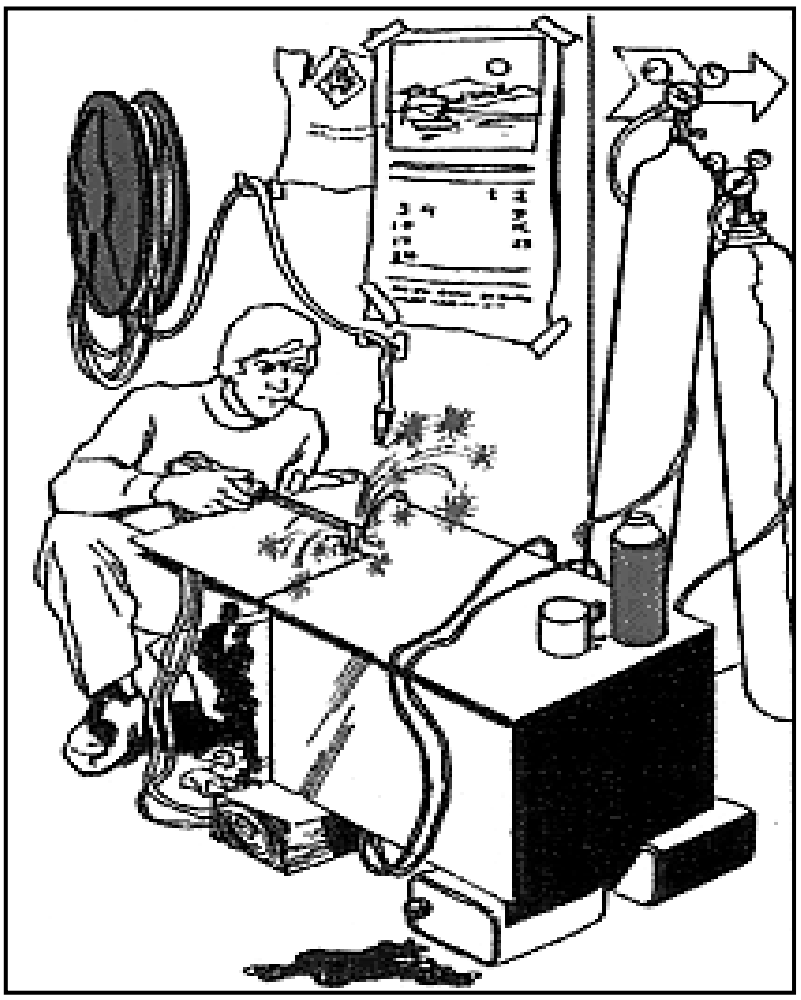
4.5 Study the picture below and answer the questions that follow.



4.5.1 Name TWO factors that cause metal to distort during the welding process. (2)

4.5.2 Name TWO ways of controlling metal distortion caused by the welding heat. (2)

4.6 The picture below shows an operator using an oxy-acetylene welding set.



4.6.1 Identify THREE safety measures that are being ignored by the operator. (3)

4.6.2 Describe the possible outcome if the gas cylinders were to topple over. (2)

4.6.3 Name TWO types of metal that can be cut with an oxy-acetylene welding set. (2)

4.7 The metal structure of a centre-pivot irrigation system is covered with a zinc coating to prevent corrosion.

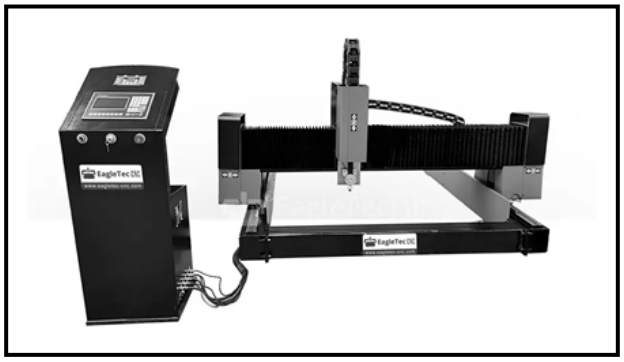
4.7.1 What is this process called? (1)

4.7.2 Why is it recommended to NOT weld directly on the zinc coating? (1)

4.8 Study the pictures below of TWO different plasma-cutting machines and answer the questions that follow.



A



B

4.8.1 Identify plasma-cutting machines **A** and **B**. (2)

4.8.2 State TWO factors that should be considered when choosing the correct plasma-cutting machine. (2)

4.8.3 What should be kept in mind when operating a plasma-cutting machine in the overhead cutting position? (2)
[35]

QUESTION 5: TOOLS, IMPLEMENTS AND EQUIPMENT

Start this question on a NEW page.

5.1 Study the picture of a baling machine below and answer the questions that follow.



5.1.1 Name TWO advantages of using a round baler on a farm. (2)

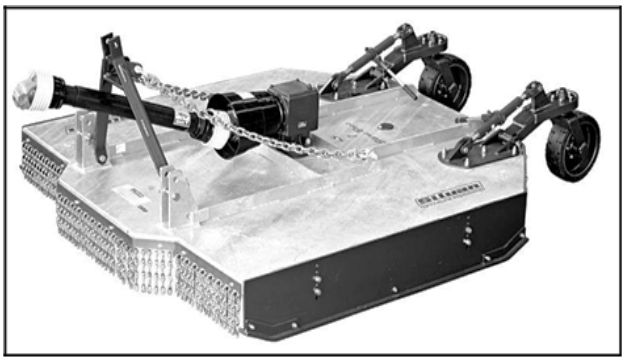
5.1.2 List FOUR procedures to follow when a baler is being prepared after not being used for a long time. (4)

5.1.3 Name the TWO types of expenses associated with a round baler and give ONE example of EACH. (4)

5.1.4 State TWO functions of a shear bolt found in the drive system of a baling machine. (2)

5.1.5 Name THREE safety measures that should be considered when attaching the drive shaft of a baling machine to the power take-off shaft of the tractor. (3)

5.2 Study the picture of a rotary cutting machine below and answer the questions that follow.



5.2.1 Discuss THREE safety hazards that must be considered when working with the rotary cutting machine shown above. (3)

5.2.2 Name TWO advantages of installing a bearing on the drive system of a rotary cutting machine. (2)

5.3 Study the picture of a hammer mill below and answer the questions that follow.



5.3.1 List THREE factors that a farmer must consider before purchasing a hammer mill. (3)

5.3.2 State FOUR points to consider when installing a hammer mill. (4)

5.3.3 State ONE function of EACH of the following components of a hammer mill:

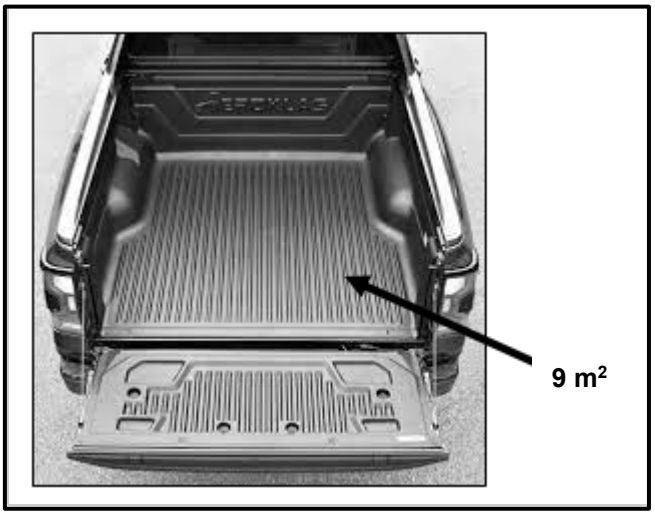
(a) Hopper (1)

(b) Cyclone (1)

5.4 A bakkie loading bin, with a surface area of 9 m², needs to be painted.

Use a rust preventative paint with a covering ability of 3 m² per litre. TWO coats of paint are required for the loading bin.

Calculate, in litres, the amount of paint required. Show ALL calculations.



(5)

5.5 Give a solution for the following problems associated with the hitching of implements:

5.5.1 The front of the tractor lifts up when pulling a plough. (1)

5.5.2 The implement works at an incorrect cross angle in relation to the tractor. (1)

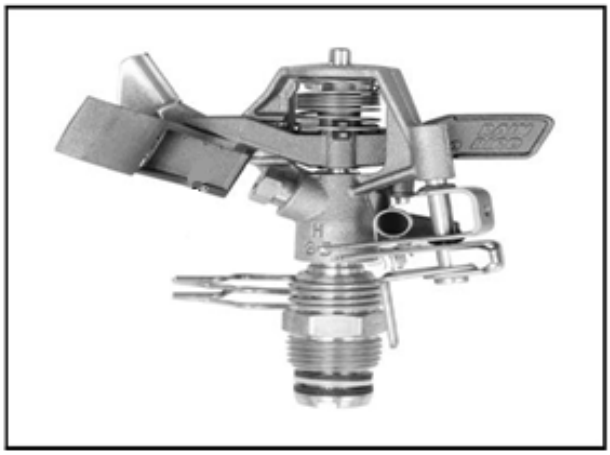
5.5.3 The rear end of the implement does not penetrate the soil. (1)

5.6 Name THREE factors that have an influence on the depth-control system of a tractor. (3)
[40]

QUESTION 6: WATER MANAGEMENT

Start this question on a NEW page.

6.1 The picture below shows an irrigation sprinkler.



6.1.1 Give FOUR reasons for using irrigation sprinklers instead of a flood irrigation system to water crops. (4)

6.1.2 List the FOUR primary parts of a sprinkler irrigation system. (4)

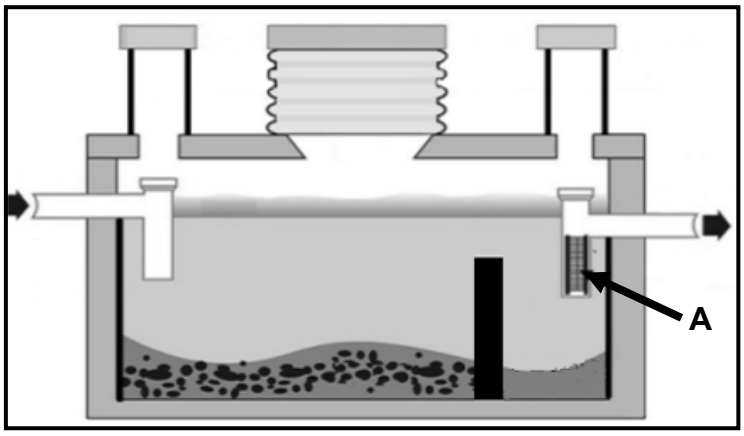
6.1.3 Name THREE types of irrigation systems that use the sprinkler shown in the picture above. (3)

6.2 The following questions are based on drainage systems used in maize fields:

6.2.1 Give a reason why a farmer sometimes needs to drain a maize field. (1)

6.2.2 Name the FOUR types of drainage systems. (4)

6.3 Study the picture of a septic tank below and answer the questions that follow.



6.3.1 What is the function of the sieve, shown by arrow **A**, on the outlet side of the septic tank? (2)

6.3.2 Describe the working of a septic tank from the moment waste water enters the tank from the inlet, to the moment the treated water exits the outlet. (3)

6.4 Complete the table below regarding different irrigation systems. Write only the answer next to the question numbers (QUESTIONS 6.4.1 to 6.4.4).

NAME	EXPLANATION/FUNCTION/WORKING	MATERIAL
6.4.1	Sprinkler irrigation consisting of several segments of pipe joined together and supported by trusses, mounted on wheeled towers with sprinklers positioned along its length, turning around a common centre	Aluminium and galvanised pipes
Garden sprinkler irrigation	A system utilising permanently installed sprinklers	6.4.2
Travelling sprinkler gun	6.4.3	Polyethylene tubing and steel drum
6.4.4	A series of pipes, each with a wheel of about 1,5 m in diameter. Sprinklers along its length with an engine installed at the middle of the pipe system for driving the system	Coupled aluminium pipes on steel wheels

(4)

6.5 Name the function of EACH of the following parts of an irrigation system:

6.5.1 Sand filter (1)

6.5.2 Irrigation timer (1)

6.5.3 Neutron moisture probe (1)

6.5.4 Solenoid valve (1)

6.5.5 One-way valve (1)
[30]

TOTAL SECTION B: 160
GRAND TOTAL: 200

Copyright reserved