



EXTERNAL INTEGRATED SUMMATIVE ASSESSMENT

EXEMPLAR PAPER 2

VERBAL THEORETICAL ASSESSMENT

MEMORANDUM

CANDIDATE INFORMATION

SURNAME													
NAMES													
ID NUMBER													
EISA REGISTRATION NUMBER													
ASSESSMENT CENTRE													
ASSESSMENT CENTRE ACCREDITATION NUMBER													

QUALIFICATION INFORMATION

QUALIFICATION TITLE	Occupational Certificate: Garden Worker
SAQA ID	99692
NQF LEVEL	02
CREDITS	69
DURATION	2 hours
TOTAL MARKS	90 marks
PASS MARK	80%
DATE OF EISA	

PAPER 2: THEORETICAL VERBAL ASSESSMENT

Time: 2 HOURS

QUESTION 1:

1.1 What type of fertilizer should be applied in the following situations:

1.1.1 Soil that has little depth, and is often waterlogged, and with no organic layer?

Answer: The type of "fertiliser" required for soil that has little depth, is often waterlogged, and has no organic layer is **Organic Matter** (like high-quality compost and/or well-rotted manure). The immediate problem is poor **soil structure and drainage**, worsened by a lack of organic matter, which would normally **hold the soil open and create air pockets**. Waterlogging occurs because the soil is too dense, often high in clay, or heavily compacted, leading to anaerobic conditions where roots die. **3 Marks**

1.1.2 Sandy soil that has too many weeds and stones?

Answer: The best approach for sandy soil that has too many weeds and stones involves applying **organic amendments** (**1 mark**) rather than just a chemical fertiliser, as the goal is to **fix the soil's structure first** and **suppress the weeds long-term** (**1 mark**). A thick layer of Mulch (e.g., wood chips, straw, or bark chips) should be added after manually removing the weeds. **2 Marks**

Total for Q1.1: **5 Marks**

1.2 How would you apply the chosen fertilizer?

Answer: **First aerate the soil using a garden fork** (**1 mark**). **Dig about 15cm** (**1 mark**) into the soil structure and apply the organic compost (e.g., well-rotted compost, aged manure, or peat moss). A **Slow-Release Granular or Organic Granular Fertiliser** (e.g., bone meal, blood meal, or a pelleted organic NPK) (**1 mark**) can be applied as a **secondary nutrient supply** (**1 mark**). Due to the sand's poor nutrient retention, fast-acting chemical fertilisers (like urea) would quickly leach away, wasting money and potentially polluting groundwater. Slow-release or organic options **feed the plants gradually over months** (**1 mark**)

Total for Q1.2: **5 Marks**

1.3 What could happen if too much or too little fertilizer is applied?

Answer: Too much fertiliser would lead to:

- Leaching away of nutrients causing groundwater contamination and a waste of money (**1 mark**)

- Limited results/ persistence of the problem, plus the risk of root burn (1.5 marks)

Too little fertiliser would lead to:

- Insufficient amount of nutrients with limited soil improvements (1 mark)
- Slower improvement and non-lasting results (1.5 mark)

Total for Q1.3: 5 Marks

1.4 What is compost and how do you make it? What should a gardener do to make good compost and prevent it from being contaminated? How often should you treat compost to protect it from contamination?

Answer:

Compost is the result of the natural process of recycling decomposed organic matter. It's a dark, crumbly, nutrient-rich material used to enrich soil and improve its physical properties. (0.25 mark)

Compost is made by managing or controlling 4 key components: the compost recipe:

Brown matter: usually made up of woody materials (branches, stems and roots) that are rich in carbon; Examples: Dried leaves, straw, shredded paper, wood chips, and sawdust (0.25 mark)

Green matter: leaves and other soft organic materials that provide nitrogen and protein for microbial growth; examples: Grass clippings, vegetable and fruit scraps, coffee grounds, and manure. (0.25 mark)

Water (moisture): the compost heap/pile should be consistently moist, like a wrung-out sponge. Water is essential for the microbes to function. (0.25 mark)

Oxygen (air): Essential for aerobic bacteria to thrive, which results in fast, odourless composting. (0.25 mark)

Basic steps to make a compost heap:

a. *Set up the Bin/Pile:* Choose a minimum size of approximately 1m x 1m x 1m to allow the pile to generate sufficient heat.

b. *Layer the Materials:* Start with a 15 cm layer of coarse brown material for aeration and drainage. Then, alternate layers of brown and green materials, aiming for a ratio of roughly 2:1 or 3:1 Brown (Carbon) to Green (Nitrogen) by volume.

c. *Add water/Dampen:* Water each layer lightly as you build the pile until it reaches the correct moisture level. (1 mark)

How often should you treat compost to protect it from contamination?

Aerate/Turn Regularly: Turn the pile with a pitchfork every 1 to 4 weeks. Turning introduces oxygen, controls temperature, and ensures even decomposition. A well-turned pile will heat up to 55°C–65°C. (1 mark)

To avoid Contaminants: Do not add diseased plant material, chemically treated wood, pet/human waste, fatty foods, dairy, meat, or oils. These attract pests and may carry pathogens or toxins that survive composting. The main treatment to avoid contamination is the heating process. This is achieved by turning the pile every 1 to 4 weeks during the active phase. (0.25 mark)

High-Heat Process: Ensure the compost pile reaches and maintains a temperature of at least 55°C (131°F) for several days during the active composting phase. This stage is crucial for killing most weed seeds, pathogens, and insect larvae. Allow the finished compost to enter a curing (maturing) stage for several weeks or months after the heating stops. (0.25 mark)

Total for Q1.4: 5 Marks

- 1.5 You have a garden with 5 sections: Area 1 has a kikuyu lawn, Area 2 has many large trees and shrubs, Area 3 has flowering plants and herbs, Area 4: has fruit trees and some bamboo, Area 5 has a mixture of indigenous trees and bulb plants with flowers. Explain how to water each of these 5 garden sections.

Answer:

Watering a garden with diverse sections requires a different approach for each area to ensure water efficiency and optimal plant health. The important thing is to water deeply and less frequently to encourage strong root systems. (2 marks)

Area 1: Kikuyu lawn area -

Frequency: Water deeply and infrequently (e.g., 2–3 times per week in summer, reducing in cooler months).

Manner: Use sprinklers that provide even coverage (ensuring head-to-head overlap). Apply enough water to penetrate the soil 15 to 20 cm deep.

Timing: Water early in the morning (4:00 AM – 10:00 AM) to minimize evaporation loss and allow the grass blades to dry before nightfall, preventing fungal diseases. (0.5 mark)

Area 2: Large trees/Shrub area

Frequency: Water very deeply and very infrequently (e.g., once every 2–4 weeks during dry periods). Established trees rely on deep root systems.

Manner: Apply water at the drip line (the area under the outer edge of the canopy), not directly at the trunk. Use soaker hoses, drip emitters, or slow application sprinklers for a prolonged period to ensure deep soil penetration (45 to 60 cm). (0.5 mark)

Area 3: Flowering Plants and Herbs

Frequency: Water more frequently than trees/lawns, as they often have shallow roots (e.g., every 1–3 days in hot weather). Check soil moisture first.

Manner: Use drip irrigation or a watering can/hose with a low-pressure wand. Apply water directly to the soil at the base of the plant to avoid wetting the leaves and flowers, which can promote disease (especially for herbs). (0.5 mark)

Area 4: Fruit Trees and Bamboo

Fruit Trees (Moderate to High Water Need): Similar to large shrubs, water at the drip line. Ensure water penetrates deeply, especially when the fruit is developing. They need consistent moisture to prevent fruit drop or splitting.

Bamboo (High Water Need): Requires frequent and copious watering, especially when establishing or during peak summer. Bamboo is sensitive to drying out. Use deep watering methods or sprinklers focused on the rhizome area. (0.5 marks)

Area 5: Indigenous Trees and Bulb Plants

Indigenous Trees: Apply the deep and infrequent method, catering to the specific needs of the species (many are water-wise and require less water than exotics once established).

Bulb Plants (Seasonal):

Growing/Flowering Season: Water consistently to ensure good bloom development.

Dormancy (After flowering): Stop watering completely (or drastically reduce it) once the foliage dies back, as most bulbs will rot if kept wet during their dormant period. (1 mark)

Total for Q1.5: 5 Marks

1.6 Discuss the environmental challenges and issues that you typically encounter in gardening.

Answer:

Water Management and Scarcity

The most common and critical challenge, especially in drier areas, is water scarcity and inefficient use. Gardens often rely on municipal water sources, placing a strain on local supplies, especially during drought or water restrictions. (2 marks)

Challenges:

Evaporation: High loss of water due to surface watering, especially during the day. (1 mark)

Rainwater/watering runoff: Poor soil structure leads to water running off before it can penetrate to the root zone. (1 mark)

Overwatering: Wasteful watering of certain plant types (e.g., indigenous species) that require minimal water. (1 Mark)

Total for Q1.6: 5 Marks

Marks Total marks for Question 1: 30 Marks

Marks Total marks for Question 1, Section 1: 30 Marks

QUESTION 2:

As a gardener your job involves caring for various types of lawns and solving typical gardening problems that you can experience in the cultivation and maintenance of lawns. Types of laws may include a selection of: (i) Kikuyu Lawn, (ii) Broad-Leaf Grass, (iii) Exotic Lawns, (iv) artificial grass and a (v) selection of sports turfs (such as sports fields in a public park or private property).

2.1 What are the various types of problems you can find as a garden worker? Explain how each of these problems can be solved.

Answer:

A garden worker caring for various types of lawns may typically encounter the following problems that could fall into four main categories: Weeds (0.25 mark), Pests and Diseases (0.25), Soil and Environmental Issues (0.25), and Maintenance Errors (0.25). (1 mark in total)

Weeds: mechanical weed removal (avoiding pesticides which could contaminate environment or cause unwanted harm (1 mark)

Pests and diseases: when necessary, use pesticides carefully and sparingly (1 mark)

Soil/environmental issues: apply mechanical treatments (aeration and turning with a garden fork and add nutrients to enhance damaged soils (1 mark)

Maintenance errors: regular checks on tools and equipment (use a checklist), reporting damaged or faulty equipment for repair by the appropriate person (technician) (1 mark)

Total for Q2.1: 5 Marks

2.2 Discuss the best watering practices for each type of lawn in the above given situations.

Answer:

- Kikuyu lawn: water deeply every 2/3 days (reduce frequency in rainy season) (2 marks)
- Broad-leaved grass: water every 3 days like kikuyu. These grasses, typically have slightly different root structures or shade tolerances than Kikuyu, but the watering should be deep and infrequent.
- Frequency: Similar to Kikuyu, infrequent deep soaking when the soil shows signs of drying out.
- Depth/Duration: Water deeply. Due to the broad blade, these lawns may show drought stress slightly sooner than fine-bladed varieties. (2 marks)
- Exotic Lawns: more frequent watering than warm season grasses in summer because they actively grow in spring/autumn but struggle (go dormant or die) in high heat. Water to prevent dormancy during extreme summer heat.

- Depth/Duration: Deep watering is still necessary, but they may need light, temporary watering to cool the canopy during severe heatwaves. (2 marks)
- Artificial grass: no watering is required at all. Water should only be used for cleaning, otherwise it should be kept dry. (2 marks)
- Sports turf: Sports turf maintenance demands very specific and often sophisticated watering to ensure a durable, consistent playing surface.
- Frequency: dependent on climate, grass type, and usage. Typically involves frequent light watering (known as syringing) to cool the turf canopy and prevent drying, followed by deeper, restorative watering to maintain root health (after use).
- Depth/Duration: Controlled via automated irrigation systems (often pop-up sprinklers) that allow for precise zone control and calculated water application based on Evapotranspiration (ET) rates. (2 marks)

Total marks for Q2.2: 10 Marks

2.3 Explain what type of fertilizer should be applied to each of these types of lawns (i – v). Discuss how the fertilizer should be applied.

Category of Lawn	Fertiliser type & Ratio	Application Method & Timing
1. Kikuyu lawn	High Nitrogen (N), moderate Potassium (K) fertiliser (e.g., 5:1:3 or 7:1:3 NPK ratios). (0.5 mark)	Broadcasting: Use a rotary or drop spreader for uniform distribution across the entire lawn surface. Apply in two passes (half rate lengthwise, half rate crosswise) to prevent streaking. (0.25 mark) Fertilise throughout the active growing season (spring to late summer). Water immediately and thoroughly after application to prevent leaf burn. (0.25 mark)
2. Broad-leafed grass	Balanced (equal ratio) NPK or a slightly higher N blend for green-up. These types are sensitive to high-salt fertilisers. (0.5 mark)	Broadcasting: Use a spreader to ensure an even coating. Take care to avoid overlap, as broad-leaf grasses are easily burned by excessive fertiliser salt concentration. (0.25 mark) Timing: During the active growing season (warm months). If using quick-release fertiliser, use a lighter rate than for Kikuyu. Water heavily after application. (0.25 mark)
3. Exotic lawns	Slow-Release Nitrogen fertiliser. (0.5 mark) High levels of Potassium (K) are crucial for winter toughness.	Broadcasting: Use a spreader, calibrating carefully for the slow-release product. Ensure even application to maintain uniform colour. (0.25 mark) Timing: Focus fertilisation on early autumn (to promote root growth) and early spring. Avoid heavy nitrogen application during the intense heat of mid-summer, as it can cause stress and disease. (0.25 mark)
4. Artificial grass	None. This is a synthetic surface that requires no nutrients. The focus is on hygiene and maintenance of the fibres. (0.5 mark)	Cleaning only: The surface may require occasional cleaning with mild, neutral detergent solutions and water. (0.5 mark)

5. Sports turf	Granular Slow-Release/Controlled-Release NPK with high levels of Nitrogen (N) and adequate Potassium (K). Iron application for colour. (0.5 mark)	Precision Spreading: Use highly accurate, calibrated professional spreaders to ensure extremely uniform application. Applications are often spoon-fed (light, frequent doses). (0.25 mark) Timing: Fertilised frequently and year-round (or throughout the playing season) based on soil tests and turf demands (spoon-feeding). Always water in immediately. (0.25 mark)
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Total Marks for Q2.3: 5 Marks

2.4 Explain when and how top dressing should be used on a lawn and why. What are the practices to be avoided and what should be encouraged when applying top dressing?

Answer:

Top dressing is the process of applying a thin, even layer of material—usually a mixture of compost, sand, and soil—over the surface of an established lawn. (2 marks)

When: The best time to apply top dressing is when the grass is actively growing period, ensuring rapid recovery and integration of the material. Summer (e.g. kikuyu): Apply in late spring or early summer, just as the grass is actively growing and after the first heavy mowing of the season. (1 mark)

How: The application method ensures the material works into the turf without smothering the grass blades. (0.5 mark)

Preparation: Mow the lawn slightly lower than usual and remove all clippings and debris. If possible, aerate the lawn first. (0.5 mark)

Material Selection: Use a finely sifted, sterile mixture of sandy loam and high-quality compost (often 70% sand, 30% organic matter). This ensures good drainage and structure improvement. (0.5 mark)

Application: Spread the top-dressing material evenly over the lawn. Use a drop spreader for accuracy, or apply small piles manually across the area. (0.5 mark)

Working In: Use the back of a rake, a stiff brush/broom, or a drag mat to work the material into the base of the turf and the aeration holes. (0.5 mark)

Watering: Water the lawn lightly afterward to help the material settle and filter down to the soil level. (0.5 mark)

What are the practices to be avoided?: *Any two of the following answers:* applying a layer thicker than 1/2 inch(1 cm); Using untested soil, heavy clay, or non-composted manure. These

introduce weed seeds, pathogens, and can severely worsen compaction; Leaving clumps or thick patches. Applying it when the lawn is soaking wet, which makes spreading impossible; Top dressing a stressed, dormant, or extremely wet lawn. (2 marks)

Practices to be encouraged: *Any two of the following answers*: Applying thin, light, and even layers. The grass blades should still be visible through the material; Using sterile finely screened, high-quality material. The texture should match or slightly exceed the current soil for best results; Brushing/Raking the material vigorously until it disappears into the base of the turf; Top dressing a recently mown and actively growing lawn, ideally after aeration. (2 marks)

Total Marks for Q2.4: 10 Marks

Total Marks for Question 2: 30 Marks

Marks Total marks for Question 2, Section 2: 30 Marks

QUESTION 3:

3.1 Identify the different tools that must be used for each of the given lawn conditions. Explain why these tools or equipment were chosen for the job.

Answer:

Picture 3a is a combination of kikuyu lawn and ornamental plant beds, with trees and shrubs on the edges. The learners should be given **1 full mark** for naming any 2 of the following tools and equipment. Half a mark (**0.5 mark**) should be given for explaining the reason.

Tool/Equipment	Reason for Choice	
Heavy-Duty Rotary Mower	Efficiency and Blade Strength: Kikuyu is a vigorous, dense grass that grows quickly and produces a lot of thatch. A robust rotary mower is necessary to handle the bulk and thickness of the grass and prevent stalling.	
Walk-Behind Broadcast Spreader	Uniform Fertilisation: Used for applying granular High-N fertiliser evenly across the large, fast-growing lawn to maintain its deep green colour and density without causing burn streaks.	
Dethatching Rake or Vertical Mower (Verticutter)	Thatch Control: Kikuyu's rapid lateral growth creates a thick, spongy layer of thatch. A verticutter is essential to periodically slice through and remove this layer, which prevents water penetration and harbours pests.	

Picture 3b is a patch of broad-leafed grass (e.g. Buffalo or St Augustine grass) surrounded by pavement/paving.

The learners should be given **1 full mark** for naming any 2 of the following tools and equipment. Half a mark (**0.5 mark**) should be given for explaining the reason.

Tool/Equipment	Reason for Choice	
Lawn Mower (Adjustable Deck)	Precise Height Control: Broad-leaf grasses (like Buffalo or St. Augustine) are typically cut higher than Kikuyu to maintain their health and shade out weeds. An adjustable deck is crucial for following the "one-third rule" at a higher setting.	
Targeted Herbicide Sprayer	Spot Weed Treatment: These grasses are often sensitive to broad-spectrum herbicides. A handheld pump or spot sprayer allows for precise application only on the weeds, avoiding damage to the broad grass blades.	
Leaf/Spring Tine Rake	Gentle Debris Removal: Used for carefully raking up leaf litter and debris without tearing the sensitive, broad stolons (runners) of the grass.	

Picture 3c is a small section of a garden in an urban setting (mix of kikuyu lawn, indigenous and non-indigenous trees) surrounded by wall.

The learner should be given **1 full mark** for naming any 2 of the following tools and equipment. One (**1 mark**) should be given for explaining the reason.

Tool/Equipment	Reason for Choice	
Lawn Mower (Adjustable Deck)	Precise Height Control: Broad-leaf grasses (like Buffalo or St. Augustine) are typically cut higher than Kikuyu to maintain their health and shade out weeds. An adjustable deck is crucial for following the "one-third rule" at a higher setting.	
Targeted Herbicide Sprayer	Spot Weed Treatment: These grasses are often sensitive to broad-spectrum herbicides. A handheld pump or spot sprayer allows for precise application only on the weeds, avoiding damage to the broad grass blades.	
Leaf/Spring Tine Rake	Gentle Debris Removal: Used for carefully raking up leaf litter and debris without tearing the sensitive, broad stolons (runners) of the grass.	
Handheld Brush/Broom	Broom: The garden will have fallen leaves during autumn which must be swept off the pavement and then vacuumed up.	
Hose with Spray Nozzle	Hygiene and watering: Used for watering the lawn, to wash away dust, pollen, and pet waste. A basic hose is used to connect the tap to reach extended sections of the garden.	
Shop Vacuum/Leaf Blower	Debris Removal: Used to easily remove light debris like dry leaves and other particles (twigs) that can accumulate on the lawn.	

Handheld garden Rake	To rake up any fallen leaves and debris on the lawn
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Total Marks for Q3.1:5 Marks

3.2 You have been asked to mow the grounds of the sports fields used for rugby and soccer in a local school. What are the typical hazards that you need to avoid while mowing the school's sports fields. What will you do to ensure that you avoid these hazards while mowing the fields?

Answer:

Learners should be awarded marks as follows for any five (5) of the following correct answers:

NB: other similar correct answers may be provided. The list is not exhausted.

Hazard Category	Specific Hazard	Explanation
Thrown Objects (0.25 mark)	Debris, rocks, balls, equipment left on the field. (0.25 mark)	High-speed mower blades can launch objects with dangerous force, causing serious injury or damaging the mower deck/blades.
Bystanders/Children (0.25 mark)	Students, staff, or the public walking or playing near the fields. (0.25 mark)	This is a high risk on school property. The danger includes direct impact from the machine, being struck by thrown objects, or walking onto the mowing path.
Slips, Trips, and Falls (0.25 mark)	Wet grass, uneven turf, hidden holes/depressions, or obstacles (e.g., irrigation heads, corner flags). (0.25mark)	Can lead to the operator losing control of the equipment, especially on steep banks or near ditches, risking roll-overs (for ride-ons) or contact with blades.
Noise and Vibration (0.25 mark)	Prolonged exposure to engine and blade noise. (0.25 mark)	Can cause long-term hearing damage (Noise-Induced Hearing Loss) and fatigue.
Chemical/Fuel Handling (for petrol mowers) (0.25 mark)	Spillage or inhalation of fuel/exhaust fumes. (0.25 mark)	Risk of fire, explosion, or carbon monoxide poisoning if refuelling is done incorrectly or in enclosed spaces.

To ensure these hazards are avoided while mowing the school sports fields, the following steps must be strictly followed:

1. Pre-Mowing Inspection and Preparation (1 mark)

NB: The learner must explain the need to prepare the area by inspection and removal of any unwanted objects to prevent damage of property/equipment (e.g. flying pebbles, etc.).

Clear the Area: Conduct a thorough pre-mowing inspection of the entire field. Systematically walk the area to remove all debris, sticks, stones, toys, corner flags, netting, or any other loose objects that could be thrown.

Identify Obstacles: Mark or mentally note fixed obstacles such as irrigation sprinkler heads, drain covers, goal post anchors, and uneven areas to raise the deck or avoid them entirely.

Check Conditions: Confirm that the grass is relatively dry. Avoid mowing wet grass as it increases the risk of slipping, compaction, and clogging.

2. Protecting Personnel and Public (0.5 mark)

NB: The learner needs to explain the need for and importance of using PPE.

Establish a Safety Zone: If possible, establish and mark a safety perimeter or boundary using cones or tape, restricting access to the area being mowed.

Communication: Coordinate with school staff or grounds managers to ensure the fields are clear of students and public during mowing hours. Never mow near people, and stop immediately if anyone approaches.

Warning: Use appropriate warning signs around the fields to notify people that mowing is in progress.

3. Equipment Operation and Maintenance (0.5 mark)

NB: The learner only needs to explain the need for safe operation and maintenance of the equipment (mower and brush cutter) to avoid/prevent damage and harm to himself and others or their property.

Personal Protective Equipment (PPE): Always wear required PPE: ear protection (muffs or plugs) to prevent hearing damage, safety glasses/goggles to protect against thrown debris, sturdy safety boots for grip and foot protection, and long pants/sleeves.

Maintain Equipment: Ensure the mower's safety shields and discharge chute guards are fully functional and in place. Never bypass safety features.

Safe Operation:

Mow up and down steep banks (not across) to reduce the risk of rolling over, if using a ride-on mower.

Turn off the engine and wait for the blades to stop before clearing a clog or making any adjustments.

4. Fuel and Chemical Management (0.5 mark)

NB: The learner only needs to explain control of spillage and awareness of the means to prevent it.

Refuel Safely: Always turn the engine off and allow it to cool before refuelling. Refuel outdoors in a well-ventilated area, away from sparks or flames. Store fuel in approved, clearly marked containers.

Ventilation: If operating in or near maintenance sheds, ensure adequate ventilation to prevent the build-up of exhaust fumes.

Total Marks for Q3.2: 5 marks

3.3 Figure 3 shows various types of motorized equipment used in gardening.

Given descriptions (Pictures, videos and vendor manuals) of different types of motorised lawn care equipment. The following can be included:

Roller mowers, Rotary Mowers, Slashers, and Edge cutters. The tools must also be selected from petrol driven, electric driven, manually operated and self-propelled equipment.

Explain how each of the following motorized equipment works:

3.3.1 Petrol Lawn Mower

3 Marks

Answer:

A petrol lawn mower operates using an internal combustion engine, typically a four-stroke engine, to generate mechanical power.

Power Generation: Fuel (petrol) is mixed with air, compressed inside the engine cylinder, and ignited by a spark plug. This controlled explosion forces a piston downward, turning the crankshaft. Power Transfer: The rotational energy from the crankshaft is directly transferred, via a shaft, to the cutting mechanism.

Cutting Action: In a common rotary mower, the shaft rotates a single, horizontal, sharpened blade rapidly beneath the deck. The speed of the blade creates suction that lifts the grass upright, and the blade chops it off at the desired height.

Mobility: The engine provides sufficient power for self-propulsion (in some models) and allows the mower to be operated anywhere without relying on power cords or battery charge. (3 marks)

3.3.2 Electric Lawn Mower

Answer:

An electric lawn mower converts electricity into mechanical energy using an electric motor to turn the cutting blades. Power Source: The motor is powered either by:

A Power Cord: Electricity is supplied continuously from a wall outlet. OR A Rechargeable

Battery: Power is drawn from an onboard lithium-ion battery (cordless model).

Power Conversion: When activated, the electric current flows to the motor to power the

central rotor to spin at high speeds. Cutting Action: This rotational force is directly connected to the horizontal cutting blade (similar to a petrol rotary mower). The blade spins, creating lift and chopping the grass cleanly.

Operation: Electric mowers are generally quieter and require less maintenance than petrol mowers, as they have fewer moving parts. (2 Marks)

3.3.3 Brush Cutter

5 Marks

Answer:

A brush cutter is a heavy-duty, powerful handheld machine designed to clear thick grass, tough weeds, woody growth, and light brush that a conventional lawn mower cannot handle.

Power Source: Typically uses a powerful two-stroke petrol engine mounted on the handle shaft (though heavy-duty electric models exist).

Drive System: The engine's power is transferred down a long, rigid shaft (boom) via a drive cable or solid rod to a gearbox at the cutting head.

Cutting Action: The gearbox steps down the rotation speed while increasing torque, turning a specialized, heavy-duty cutting attachment, which is often a metal blade (like a circular saw blade or a tri-lobe blade).

Function: The rigid blade spins rapidly, providing the inertia and strength needed to cut through dense, woody vegetation by impact and slicing. (5 marks)

3.3.4 Weed Eater

5 Marks

A weed eater is a lighter handheld machine used for trimming grass in tight spaces, edging lawns, and clearing light, wispy weeds (2 marks).

Power Source: Can be powered by a small two-stroke petrol engine, a corded electric motor, or a rechargeable battery motor, typically located near the handle or shoulder-mounted (1 mark).

Drive System: The power is transferred down a shaft (rigid or flexible) to the cutting head.

Cutting Action: The core mechanism is a spool and head that rapidly spins a loop of nylon line (string). The inertia and speed of the spinning line provide the force required to cut the soft cell tissue of grass and weeds through impact and whipping action (1 mark).

Function: It is highly effective for detailed work, such as trimming around obstacles (fences, trees) and creating sharp edges, where a blade would be unsuitable or dangerous. (1 mark)

Total Marks for Q 3.3.4: 5 marks

Total Marks for Question 3.3: 15 Marks

3.4 What are the hazards and risks of using motorized lawn mowers or lawn care equipment? 5 Marks

Answer:

Using motorized lawn care equipment (such as lawn mowers, string trimmers, and brush cutters) involves several significant hazards that can lead to serious injury if proper precautions are not taken.

1. Mechanical Hazards (1 mark)

These relate to the moving parts of the machinery itself.

Hazard	Associated Risk(s)	Explanation
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Direct Contact with Cutting Blades/Line	Severe Lacerations, Amputations, Deep Cuts	The risk occurs when trying to clear a jam, adjust components, or accidentally falling into the path of the moving blade/line while the machine is running or still rotating after being switched off.
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Equipment Malfunction	Loss of Control, Component Failure	Poorly maintained or damaged equipment (e.g., loose bolts, fractured shafts, dull blades) can lead to the machine breaking apart or becoming uncontrollable during use.
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2. Ejection Hazards (1 mark)

These involve objects being thrown by the rapidly rotating blades or line.

Hazard	Associated Risk(s)	Explanation
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Thrown Objects	Eye Damage (Blindness), Bruising, Concussion	Mowers and trimmers can eject stones, sticks, wire, and other debris at very high speeds, posing a significant danger to the operator and any nearby bystanders.
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3. Noise and Vibration Hazards (1 mark)

These affect the long-term health of the operator.

Hazard	Associated Risk(s)	Explanation
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High Noise Levels	Permanent Hearing Loss (NIHL), Tinnitus	The constant, loud engine and blade noise of motorized equipment, especially petrol models, can cause cumulative, irreversible damage to the inner ear over time.
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Excessive Vibration	Hand-Arm Vibration Syndrome (HAVS), Fatigue, Loss of Grip	Prolonged use of equipment like string trimmers or brush cutters causes vibration that can damage nerves and blood vessels in the fingers and hands.
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4. Chemical and Fire Hazards (1 mark)

These relate primarily to petrol-powered equipment.

Hazard	Associated Risk(s)	Explanation
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Hot Engine/Exhaust	Severe Burns	Touching hot components like the engine casing, muffler, or exhaust while the machine is running or shortly after shutdown.
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Fuel Handling	Fire, Explosion	Spilling petrol while refuelling on a hot engine, or improper storage of fuel.
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Exhaust Fumes	Carbon Monoxide Poisoning	Operating petrol engines in poorly ventilated or enclosed spaces (like sheds or garages) leads to the accumulation of toxic carbon monoxide gas.
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5. Ergonomic and Environmental Hazards (1 mark)

These cover the operational environment and physical demands.

Hazard	Associated Risk(s)	Explanation
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Slips and Falls	Broken Bones, Head Injuries	Mowing on slopes, wet grass, or tripping over power cords (electric mowers) can cause the operator to fall, potentially onto the machine.
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Electric Shock (Electric/Corded Models)	Electrocution	Cutting or damaging the power cord, or operating corded equipment in wet conditions where electrical current can escape.
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Back/Muscle Strain	Musculoskeletal Injuries	Handling heavy equipment, especially repetitive lifting and maneuvering required with brush cutters and heavy push mowers.
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Total Marks for Q 3.4: 5 marks

3.5 List all items to be used to prevent damage to your body during lawn mowing or grass-cutting. What could happen if you do not use the personal protective equipment correctly?

Answer:

***NB:** The learner should be given 1 mark for any 10 correct answers from below, provided that the total mark for question 3.5 is 10 marks:*

Protecting yourself while mowing or cutting grass requires the correct use of Personal Protective Equipment (PPE).

Required Personal Protective Equipment (PPE)

The following items should be used to prevent damage to your body during lawn mowing or grass-cutting:

1. **Eye Protection** (Safety Glasses or Goggles): Essential for protecting the eyes from fast-moving debris. (1 mark)
2. **Hearing Protection** (Ear Plugs or Ear Muffs): Necessary to reduce exposure to high decibel levels from the engine and blades. (1 mark)
3. **Foot Protection** (Steel-Toe or Sturdy Safety Boots): Provides puncture and impact protection, and crucial grip for stability. (1 mark)
4. **Hand Protection** (Work Gloves): Protects against vibration, blisters, cuts, and scrapes. (1 mark)
5. **Leg Protection** (Long Trousers/Durable Pants): Guards legs against thrown objects, cuts, and brush. (1 mark)
6. **Head Protection** (Safety Helmet or Cap): Reduces exposure to the sun and provides a minor buffer against overhead debris (less critical for push mowing, more so for brush cutting). (1 mark)

If one does not use the personal protective equipment correctly, the potential consequences can range from minor injuries to permanent physical damage such as:

1. **Eye Protection:** "Permanent Eye Damage or Blindness: Thrown objects (small stones, sticks, wire, glass) can enter the eye at high speed. (1 mark)

2. **Hearing Protection:** Noise-Induced Hearing Loss (NIHL): Cumulative, irreversible damage to the inner ear, resulting in permanent hearing loss or Tinnitus (ringing in the ears). (1 mark)
3. **Foot Protection:** Severe Cuts, Lacerations, or Amputation: The foot can slip under the mower deck, or be struck by heavy dropped equipment. (1 mark)
4. **Hand Protection:** "Hand-Arm Vibration Syndrome (HAVS): Damage to the nerves and blood vessels in the hands and fingers from continuous vibration, leading to numbness, tingling, and pain. Blisters and Cuts from manual handling. (1 mark)
5. **Leg Protection:** Skin Lacerations (deep cuts) and Bruising: Exposed skin is highly vulnerable to being struck by ejected debris or the cutting line of a trimmer. (1 mark)

Total Marks for Question 3.5: 10 Marks

Total Marks for Question 3, Section 3: 30 Marks

TOTAL MARKS FOR PAPER 2 VERBAL ASSESSMENT: 90 MARKS