Assessment Schedule – 2019

Agricultural and Horticultural Science: Demonstrate knowledge of horticultural plant management practices and related plant physiology (90924)

Assessment Criteria

Question ONE: Vegetable garden

Achievement	Achievement with Merit	Achievement with Excellence
Describes horticultural plant management practices and related plant physiology and / or growing conditions.	**Links** ideas to **explain** why horticultural plant management practices, or steps within practices, are carried out.	**Applies knowledge** of horticultural plant management practices to given situations. This may involve **comparing and contrasting**, or **justifying** management practices.

N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	**Describes** TWO ideas at Achievement level.	**Describes** THREE ideas at Achievement level.	**Describes** FOUR ideas at Achievement level.	**Explains** THREE ideas at Merit level.	**Explains** FOUR ideas at Merit level.	**Justifies** the given method.	**Fully justifies** the given method by comparing and contrasting.
N0 = No response; no relevant evidence.							

Evidence

Q1	Evidence
(a)	**Describes** (Achievement) actions or steps to prepare a seedbed, and **explains** (Merit) why each action is carried out.

Description (Achievement)	**Explanation** (Merit)
• Remove weeds.	• This reduces competition for light, space, water, and nutrients.
• Cultivate soil (may be several steps in here).	• This is done to loosen the soil, making it easier to plant, and making a level seed bed. This makes soil particles smaller and enables easier root growth and penetration into the soil.
• Add fertiliser or compost.	• This provides nutrients for the new plants to ensure healthy growth.
• Level and contour the soil.	• It is important to keep the soil within the boundaries of the seedbed. It ensures even emergence and prevents water pooling in some areas of the garden, which would have a detrimental effect on germination or seedling growth.
• Wet / water the soil.	• Once the seed has been sown, water is needed for germination to occur.

<table>
<tr><td>(b)</td><td>Describes (Achievement) how fertiliser is applied, and explains (Merit) how it affects plant growth.
Applied by hand, or dissolved in water and applied via a watering can (Achievement).
Increases nutrients available for plant growth or plant processes (Merit), which improves plant health, growth and production (Merit), e.g. nitrogen increases leafy growth (Merit), phosphate improves root, bud and flower development (Merit).</td></tr>
<tr><td>(c)</td><td>Describes (Achievement), explains (Merit), justifies (Excellence) why a grower would use physical methods of weed control over chemical processes.
Physically removing weeds is usually done by pulling them out by hand or using a push hoe (Achievement), whereas chemical methods require using herbicides, either sprayed or painted on (Achievement).
Weeds compete with desired plants for water, light, nutrients, and space (Achievement). Weeds can also be a habitat for pests and diseases (Achievement). Leaving them in the garden will reduce the quantity (Merit) and quality of the vegetable yield (Merit).
<table>
<tr><td>Physical control
Advantages
It can be done selectively around desirable plants, so they are not damaged or killed.
It is effective immediately.
It can ensure all tap roots are removed.</td><td>Chemical control
Advantages
It is quicker.
Herbicides kill the whole plant, whereas physical weeding sometimes pulls only the leaves off, leaving the root to re-grow.</td></tr>
<tr><td>Disadvantages
This is labour-intensive and time-consuming.
Ineffective weeding can result in living parts of the weed re-growing.
It needs to be done regularly.</td><td>Disadvantages
Spray drift can damage desirable plants, or contaminate them for eating.
Application requires calm conditions without imminent rain.
Herbicides can be costly.
Knowledge, safety gear, and training are needed when working with chemicals.
Is slower to take effect.</td></tr>
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Question TWO: Apples

N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	**Describes** TWO ideas at Achievement level.	**Describes** THREE ideas at Achievement level.	**Describes** FOUR ideas at Achievement level.	**Explains** THREE ideas at Merit level.	**Explains** FOUR ideas at Merit level.	**Justifies** the given methods.	**Fully justifies** the given methods.
N0 = No response; no relevant evidence.							

Evidence

Q2	Evidence
(a)	**Describes** (Achievement), **explains** (Merit) how to prune apple trees, and **explains** (Merit) why it should be done in winter. • Use sharp loppers or a pruning saw (Achievement) to ensure that the wound is clean to reduce the likelihood of disease (Merit). • Cut branch off just above an outward-facing bud (Achievement) for outward growth, and to prevent new branches from crossing over each other (Merit). • Cut on an angle away from the bud (Achievement) so water drips away from the bud, which should reduce the chance of rot or disease (Merit). • Remove pruned-off material (Achievement) to stop providing a site for pests and disease (Merit). Removal prevents diseased material re-infecting the plant (Merit). • Prune in winter when there are no leaves (Achievement). Without leaves it is more obvious where to cut (Merit). Pruning should be done just before the plants start to produce new growth (Merit) while the wood is dormant. • Prune in late winter before the plants start to produce new growth (Achievement), as it removes all the previous year's wood and allows the plant to sprout in spring when the sap is rising (Merit).
(b)	**Describes** (Achievement) why mulch is used, and **explains** (Merit) how it improves plant growth and fruit production. • Mulch is used to prevent moisture loss from the soil (Achievement), which means there is more soil water available to be taken up by the roots (Merit) and for plant processes to take place, such as photosynthesis, transpiration, respiration, and cellular turgidity (Merit). • Prevents weeds from growing (Achievement), which prevents them from competing with the trees for water, light, and nutrients (Merit), or could harbour pests and diseases, which would reduce plant growth (Merit). • Sometimes mulch is reflective (Achievement), which increases the light to the plant and increases the rate of photosynthesis (Merit).

(c) **Describes** (Achievement), **explains** (Merit), **justifies** (Excellence) using both the parasitic wasp (biological control) and chemical pesticide to control codling moth.

Parasitic wasp	**Insecticides**
Advantages • Wasp is easily purchased and requires little to no training or labour (Achievement) as it targets a specific part of the lifecycle of the moth (Merit), which means that it will not mature to adulthood (Merit), so cannot produce more eggs and codling worms to re-infect the area or orchard (Merit). • Once set up, there are fewer ongoing costs. It is a one-off labour job (Achievement), which leaves time for other jobs and increases profit (Merit). • No spray residue (Achievement) means a withholding period is not required before harvesting (Merit). • Kills only target insects (Achievement). Beneficial insects are unaffected (Merit).	*Advantages* • Works quickly and is highly effective (Achievement), so less damage to fruit or trees (Merit). • Consistent and kills more, faster (Achievement), so grower has more predictable harvests (Merit).
Disadvantages • Can be expensive initially (Achievement), which can reduce profit (Merit). • Never 100% effective (Achievement). • Not consistent (Achievement).	*Disadvantages* • Has to be repeated several times, over many months (Achievement). • Sprays are weather-dependent (Achievement). • Labour-intensive (Achievement), so reduces profit (Merit). • Pesticides can be costly (Achievement). • Knowledge, safety gear and training are needed when working with chemicals (Achievement). • Withholding period on harvest (Achievement). • Moths could develop pesticide resistance (Achievement). • Insecticides can kill non-target or beneficial insects (Achievement).

Question THREE: Growing flowers

N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	**Describes** TWO ideas at Achievement level.	**Describes** THREE ideas at Achievement level.	**Describes** FOUR ideas at Achievement level.	**Explains** THREE ideas at Merit level.	**Explains** FOUR ideas at Merit level.	**Justifies** the given method.	**Fully justifies** the given method.
N0 = No response; no relevant evidence.							

Evidence

Q3	Evidence
(a)	**Describes** (Achievement) how stopping is carried out, and **explains** (Merit) how it affects the plant. • 'Stopping' is the removal of the terminal bud (Achievement) to make the plant invest more energy into the side shoots (Merit), giving a bushier plant, and increased flower production (Merit).
(b)	**Describes** (Achievement) how water enters and moves through the plant, and **explains** (Merit) the effect it has on plant processes. • Water enters the plant thought the root hairs (Achievement) in a process called osmosis (Achievement). It travels around the plant via the xylem (Achievement). • Water is needed for plant processes such as photosynthesis, respiration, and transpiration (Merit). It is also needed for cell turgidity (Merit).
(c)	**Describes** (Achievement), **explains** (Merit), **justifies** (Excellence) why growing plants in a glasshouse increases production. • Production is increased because the environment can be monitored and controlled (Achievement). This will mean the flowers are less susceptible to environmental impacts, and the quantity and quality of the flowers will be greater (Merit). Flowers can be grown for a longer period of time (Achievement), due to environmental factors being controlled (Merit).

Description (Achievement)	**Explanation** (Merit)
• Carbon dioxide levels can be increased by releasing it into the greenhouse through pipes. • The temperature can be increased by heating water running through pipes, or by pumping in warmer air. • The temperature can be decreased by introducing outside air into the greenhouse through vents in the roof, or on the sides of the greenhouse, or by fans drawing air through the greenhouse. • High humidity can be reduced through ventilation. • Light can be increased by using growing lights placed in the roof cavity above the plants.	• Raised carbon dioxide levels improve the rate of photosynthesis, which increases production. • Raising the temperature increases the rate of plant processes, increasing the rate of growth and production. • If the temperature is too high, the plant can become stressed and this reduces the speed of plant processes, such as photosynthesis and respiration, reducing production. • Lower humidity reduces likelihood of disease outbreaks. It helps maintain the leaf area for photosynthesis so that plant production is maximised. • Supplying higher light levels, will maximise the rate of photosynthesis and increase glucose production for plant growth.

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 6	7 – 12	13 – 18	19 – 24