# RHS LEVEL 3 ADVANCED CERTIFICATE IN HORTICULTURE
# WRITTEN EXAMINATION

## 2:00pm Tuesday 7th July 2009

# MODULE B

## Principles of Plant Taxonomy, Morphology & Anatomy
## Knowledge of Plant Health
## Processes of Plant Physiology

### Section A – Short Answer Questions

Candidate Number:……

Candidate Name:……

Centre Number/Name:……..

**IMPORTANT – Please read carefully before commencing.**

i) The duration of the papers in Module **B** is **2 hours**.
ii) Answer **ALL** questions in Section **A**.
iii) **ALL** questions in Section **A** carry equal marks.
iv) Write your answers legibly in the spaces provided.
v) Use metric measurements **ONLY**.
vi) Where plant names are required, they should include genus, species and where appropriate cultivar.

## ANSWER ALL QUESTIONS

**MARKS**

**Q1** State the meaning of the specific epithet in **EACH** of the following:

i) *Pyrus salicifolia*;
ii) *Wisteria sinensis*;
iii) *Erica carnea*;
iv) *Pseudotsuga menziesii*. **2**

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**Q2** a) Describe **EACH** of the inflorescence types listed below:

i) raceme;
ii) spike.

b) Name **ONE** example for **EACH** type of inflorescence in part a). **2**

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**Q3** a) Explain the term ‘bolting’.

b) State **TWO** common causes of ‘bolting’ in **NAMED** crop plants. **2**

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**Please see over/…..**

## ANSWER ALL QUESTIONS

**MARKS**

**Q4** a) State the meaning of the following terms:

i) monoecious;
ii) dioecious.

b) Give **ONE NAMED** example of **EACH**. **2**

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**Q5** State the environmental conditions most favourable to the spread of **EACH** of the following pests and diseases:

i) powdery mildew;
ii) two spotted spider mite;
iii) grey mould;
iv) rose black spot. **2**

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**Q6** State **FOUR** factors that can determine the photosynthetic efficiency of plants. **2**

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## ANSWER ALL QUESTIONS

**MARKS**

**Q7** Name the plant tropisms involved when seeds germinate below soil level and relate **EACH** to the stage of root and shoot growth. **2**

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**Q8** Explain, with **NAMED** examples, the terms ‘alternate host’ and ‘alternative host’ as applied to plant pests and diseases. **2**

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**Q9** State **FOUR** factors that can affect water uptake by plants from the soil. **2**

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**Q10** Describe the structure and state the function of the root cap. **2**

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**RHS LEVEL 3 ADVANCED CERTIFICATE IN HORTICULTURE**
**WRITTEN EXAMINATION**

**2:00pm Tuesday 7th July 2009**

# MODULE B

## Principles of Plant Taxonomy, Morphology & Anatomy
## Knowledge of Plant Health
## Processes of Plant Physiology

**Sections B, C & D - Structured Questions**

**IMPORTANT – Please read carefully before commencing.**

i) The duration of the papers in Module **B** is **2 hours**.
ii) Answer **ONE** question from **EACH** of the sections **B**, **C** and **D**.
iii) **ALL** questions carry equal marks.
iv) Write your answers legibly in the answer booklets provided.
v) Use metric measurements **ONLY**.
vi) Where plant names are required, they should include genus, species and where appropriate cultivar.

**Please turn over/…..**

## Section B – Principles of Plant Taxonomy, Morphology & Anatomy

### Answer ONE question only from this section

**MARKS**

**Q11** a) Draw a large, fully labelled, diagram of a typical plant cell. **6**

b) Explain the function of any **FOUR** cell organelles. **8**

c) Describe, how the structure of the following cell types, differs from the typical cell drawn in a):

i) a xylem tracheid;
ii) an upper epidermal cell from a leaf. **6**

**Q12** a) Describe, with the aid of clearly labelled diagrams, the structure of **TWO** distinctly different types of bulb. **12**

b) State, using **NAMED** examples, **FOUR** different ways in which bulbs can be used in the garden. **4**

c) State the name and characteristics of any taxonomic group above the level of genus to which bulbous plants belong. **4**

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**Please see over/…..**

## Section C – Processes of Plant Physiology

## Answer ONE question only from this section

**MARKS**

**Q13** Explain the physiological processes responsible for **EACH** of the following conditions/responses:

i) guttation; **5**

ii) the death of a plant in a water-logged soil; **5**

iii) an increase in plant growth resulting from burning propane gas in a greenhouse; **5**

iv) deterioration of plant quality in a warm greenhouse over winter. **5**

**Q14** a) Describe the processes of diffusion and osmosis. **4**

b) Describe the pathways and mechanism of water movement from the soil to the leaves. **8**

c) Describe the pathways and mechanism of movement of mineral ions from the soil to the stem apex. **8**

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**Please turn over/…..**

## Section D – Knowledge of Plant Health

## Answer ONE question only from this section

**MARKS**

**Q15** a) Describe the characteristics associated with an infestation of **EACH** of the following:

i) mealy bug;
ii) scale insect. **4**

b) Describe the life-cycle and typical host plants for **EACH** of the pests listed in a). **8**

c) Evaluate a range of methods available for the control of **ONE** of the pests listed in a) above. **8**

**Q16** With reference to **EITHER** apple **OR** plum canker:

i) name the causative organism; **2**

ii) describe the life-cycle of the selected canker; **6**

iii) describe the symptoms of infection by the pathogen; **6**

iv) review methods for the control of the selected canker. **6**

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# RHS LEVEL 3 ADVANCED CERTIFICATE IN HORTICULTURE
# WRITTEN EXAMINATION

## 2:00pm Tuesday 7th July 2009

## MODULE B

## Principles of Plant Taxonomy, Morphology & Anatomy, Processes of Plant Physiology, Knowledge of Plant Health.

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|---|---|---|---|---|---|
| **Candidates Registered** | **191** | | **Total Candidates Passed** | 97 | 62.58% |
| Candidates Entered | 155 | 81.15% | Passed with Commendation | 17 | 10.97% |
| Candidates Absent | 29 | 15.18% | Passed | 80 | 51.61% |
| Candidates Deferred | 6 | 3.14% | Failed | 58 | 37.42% |
| Candidates Withdrawn | 1 | 0.53% | | | |

## Section A – Short Answer Questions

**Q1** State the meaning of the specific epithet in **EACH** of the following:

i) *Pyrus salicifolia*;
ii) *Wisteria sinensis*;
iii) *Erica carnea*;
iv) *Pseudotsuga menziesii*.

In almost all cases candidates were able to refer, correctly, to the specific epithet. Answers which attracted marks included:-

i) *Pyrus salicifolia* – having leaves like a Salix (Willow) tree.
ii) *Wisteria sinensis* – originating in or coming from China.
iii) *Erica carnea* – having flesh coloured or pink(ish) flowers.
iv) *Pseudotsuga menziesii* – named after Archibald Menzies or discovered by the same.

*Erica carnea* gave candidates the most difficulty. References which linked *E. carnea* to heathland or acid soils did not attract any marks. Similarly references to red coloured flowers failed to gain marks.

**Q2** a) Describe **EACH** of the inflorescence types listed below:

i) raceme;
ii) spike.

Name **ONE** example for **EACH** type of inflorescence in part a).

Candidate answers indicated a good knowledge of this subject area with many gaining full marks, common errors which did not attract marks included correct information being given but under the wrong heading. Also candidates were too frequently referring to “peduncles” and “petioles” when it should have been pedicels with reference to raceme inflorescences. There was some evidence of lack of preparation and revision when candidates incorrectly described and gave sketches of umbel and capitulum type inflorescences.
Many candidates were able to identify one plant example for each inflorescence correctly but a number of candidates incorrectly gave *Syringa vulgaris* (lilac) as an example of a raceme inflorescence when it is in fact a panicle. Some genera given as examples by candidates contain plants “with spikes or racemes”. The examiner awarded marks for either in these particular cases.

**Q3** a) Explain the term ‘bolting’.

b) State **TWO** common causes of ‘bolting’ in **NAMED** crop plants.

a) This part of the question was correctly answered by most candidates who indicated that ‘bolting’ is a state of premature flowering. Answers attracting marks contained this phrase or other wording which indicated the same.

b) Candidates frequently failed to state two causes of ‘bolting’ and when they did, named crop plants were not given. In these cases marks were not awarded. Marks were awarded only for specific named causes of bolting in named crop plants. Marks were awarded for examples such as:-

- Named brassica plants raised early under protection (or sown early outdoors) and planted out early then exposed to cold (vernalisation) temperatures which triggered premature flowering.
- *Beta vulgaris* (beetroot) cultivars sown too early outdoors and early (advanced) growth subject to low temperature vernalisation and later bolting.
- Named lettuce, spinach or rocket crops subjected to drought water stress problems which induces premature flowering (bolting) and going to seed.

Marks were not awarded for references to irregular watering, dry weather, or high temperature exposure as possible causes of bolting without the link to dry soils or crops experiencing water stress conditions etc.

**Q4** a) State the meaning of the following terms:

i) monoecious;
ii) dioecious.

b) Give **ONE NAMED** example of **EACH**.

Too many candidates did not understand the meaning of these terms and gave answers which confused them with the terms monocotyledon and dicotyledon. Such

answers did not attract marks. Similarly those who described monoecious plants as having male and female parts on the same plant failed to gain marks since this could equally apply to hermaphrodite plants.
Answers attracting marks clearly distinguished monoecious plants as having separate single sex flowers on the same plant eg. *Corylus avellana* and dioecious plants having single sex flowers on separate plants eg. *Ilex aquifolium*. Other correctly named plant examples gained marks.

**Q5** State the environmental conditions most favourable to the spread of **EACH** of the following pests and diseases:

i) powdery mildew;
ii) two spotted spider mite;
iii) grey mould;
iv) rose black spot.

Many candidates were familiar with the main environmental conditions which favour the spread of the disease and pest problems listed and therefore gained marks. In some instances candidates gave confused or contradictory answers necessitating the apportionment of marks to reward the parts of the answers with correct information. For example there were references in the case of two spotted spider mite to hot humid conditions favouring spread. The first part "hot" is correct but the second part "humid conditions" would tend to discourage and help to control the spread. Also candidates were referring to "warm" conditions for the spread of powdery mildew and two spotted spider mite which although not strictly incorrect it would have been better to refer to hot or high temperature conditions. Also some candidates failed to identify the significance of water or drought stress with each of those common problems.
In the case of powdery mildew candidates often failed to recognise the significance of some moisture or humidity to trigger spore germination and many overlooked the need for air currents (wind) to aid the distribution of spores. Many candidates identified that grey mould can spread effectively over a wide temperature range in the presence of atmospheric humidity. Although many answers identified the need for warm humid conditions with rose black spot some failed to identify the need for rain or irrigation splash to scatter spore populations around to infect other plants nearby.

**Q6** State **FOUR** factors that can determine the photosynthetic efficiency of plants.

There was clear evidence of effective teaching and revisionary processes having taken place in the answers given to this question. Most candidates were able to identify four factors involved in the photosynthetic efficiency of plants and gained full marks.
Satisfactory answers identified by candidates included reference to the need for adequate levels of carbon dioxide, water, temperature, light levels, duration and quality, the need for adequate nutrient supply particularly those directly influencing the "greenness" or chlorophyll content of leaves eg. nitrogen, magnesium, and iron etc. Some referred correctly to drought or water stress conditions determining photosynthetic efficiency.
In some answers it would have been helpful if candidates could have clarified them slightly to indicate what it is that is determining photosynthetic efficiency, for example:-

- Waterlogged soil causing root death and lack of water/nutrient uptake.
- Compacted soil preventing adequate take up of water and nutrients.

- Sooty mould on foliage leaves preventing light absorption.

Those failing to gain full marks were mainly those who failed to identify the required four factors.

**Q7** Name the plant tropisms involved when seeds germinate below soil level and relate **EACH** to the stage of root and shoot growth.

Candidates were expected to relate their answers to the seeds' germination stages below soil level, so references to the emerging (emergent) radicle and plumule are required. Candidates should have identified the positive geotropic response of the emerging radicle and the negative geotropic response of the rising plumule. Likewise candidates should have referred to the plumule as it emerges becoming positively phototropic. Candidates who were able to name these positive or negative tropisms and relate them to the seedling development stages were awarded marks. In other cases marks were apportioned to reflect partially correct answers. Those answers referring to hydrotropism and chemotropism did not attract marks as they are unlikely to be relevant at this "seedling stage" of plant development.

**Q8** Explain, with **NAMED** examples, the terms 'alternate host' and 'alternative host' as applied to plant pests and diseases.

This question was found difficult to answer by many candidates who frequently gave confused or conflicting answers resulting in nil marks or at best low marks being awarded. In the case of 'alternate host' candidates were expected to refer to distinctly separate plants between which a pest or disease will shuttle or move between to complete certain stages of their life cycle at different times of the year. For example, the peach potato aphid will overwinter on peach trees (and other woody perennials) as egg or nymphal stages before migrating in late spring and early summer to potatoes and other herbaceous plant types. Other valid examples eg. pear rust which overwinters on *Juniperus sabina* and migrates to pears in summer would also attract marks.
Candidates should have referred to 'alternative host' as being different plants or a range of different plants which can be attacked by an identified pest or disease at a certain stage in its life cycle. For example the peach potato aphid in its summer life cycle stage although found on potatoes can also be found on many alternative herbaceous plant species and Fuchsia rust may be found on *Epilobium* species as an alternative host to *Fuchsia*. Apportioned marks were awarded for partially correct answers. Many candidates failed to gain marks when they did not give examples of host plants and pest and disease examples involved.

**Q9** State **FOUR** factors that can affect water uptake by plants from the soil.

Most candidates were able to identify four factors affecting the uptake of water by plants to gain full marks. Those not gaining full marks, in the main, failed to identify four factors so marks were apportioned accordingly.
Candidates through this question demonstrated a sound and wide-ranging knowledge of this subject area. Some of the answers given by candidates which gained marks included:-

- Relative water potentials between the soil water solution and the water potential inside root cells
- Air and soil temperatures
- Frozen soils
- Waterlogged soils
- Light levels

- Soil borne pest and diseases attacking plant roots
- Wind speed
- Root mycorrhizal association
- Soil pans

Other valid answers attracted marks.

**Q10** Describe the structure and state the function of the root cap.

Insufficient information was given by candidates in answer to this question. In particular the two parts of the question ie. “describe the structure” and “state the function” were either not answered fully or one part was omitted. Therefore a lower number of candidates actually gained full marks.
In describing the structure of the root cap candidates should have identified the apical meristems producing a sheath of parenchyma cells surrounding the tip of the root. Also in stating the function answers should have referred to the outer root cap protecting the inner sensitive meristematic tissue from soil particulate abrasion as the root pushes forward through the soil. Reference to the regenerative nature of the apical meristems in producing apical cap replacement tissue also attracted marks.

## Section B – Principles of Plant Taxonomy, Morphology & Anatomy

**Q11** a) Draw a large, fully labelled, diagram of a typical plant cell.

b) Explain the function of any **FOUR** cell organelles.

c) Describe, how the structure of the following cell types, differs from the typical cell drawn in a):

i) a xylem tracheid;
ii) an upper epidermal cell from a leaf.

AIMS

The aims of the question were to test candidates' ability to draw a clear diagram, to be able to summarise the function of a selection of cell organelles and to be able to describe two types of specialised plant cell.

COMMENTS

The great majority of diagrams were large and fully labelled. It is arguably better for the clarity of the diagram if a small space is left between cell membrane and cell wall. Whether this convention is adopted or not, label lines must end on the structure labelled. It is worth noting that the singular of mitochondria is mitochondrion and of plasmodesmata is plasmodesma, although the use of the plural in labelling one structure was not penalised in the examination.

The functions of chloroplasts and mitochondria were fairly well understood although candidates were not always aware that there were only two marks available for each and described the biochemical processes occurring in them to some length. Otherwise candidates were not very sure as to what constituted an organelle giving descriptions of cell wall, cytoplasm and plasmodesmata. Detail was often lacking for the other organelles eg. the role of the nucleus in the production of mRNA for protein synthesis was rarely mentioned and there were vague statements concerning 'genetic information' instead of chromosomes and DNA.

The tracheid and upper epidermal cell were not described very well. In the case of the tracheid there was much confusion with vessels and sclerenchyma. Most accounts of the upper epidermal cell included a large number of chloroplasts instead of none and many included stomata (if it was clear the answer referred to Nymphaea or similar, then credit was given).

RECOMMENDATIONS

Candidates should try to ensure that the length of their answer reflects the marks allocated to that section.

In all diagrams, label lines should touch the structure labelled.

**Q12** a) Describe, with the aid of clearly labelled diagrams, the structure of **TWO** distinctly different types of bulb.

b) State, using **NAMED** examples, **FOUR** different ways in which bulbs can be used in the garden.

c) State the name and characteristics of any taxonomic group above the level of genus to which bulbous plants belong.

AIMS

The aims of the question were to test candidates' knowledge of the structure, uses and classification of bulbous plants.

COMMENTS

This question was very unpopular. Most candidates were unaware of tunicate and etunicate bulbs and attempted to use corms and tubers as examples of a second type of bulb. Diagrams were not very clear and were almost always unaccompanied by description even though the question specifically asked for it. In fact, the emphasis of the question was on the description (9 marks) supported by diagrams (3 marks).

The use of bulbs was well known in general although non-bulbs were often suggested and common names used.

The classification part of the question was, in general, poorly done. Examples of taxa that would have been acceptable were any relevant family (*Liliaceae*, *Amaryllidaceae*, *Alliaceaea* etc), Monocotyledonae, Angiospermae, Spermatophyta and even Plantae, but very few candidates could suggest even one.

RECOMMENDATIONS

Candidates should be careful to follow the instructions of the question so that if a description is requested, then a description should be provided.

When a plant is mentioned in the answer to a question, it should be given its full botanical name.

Classification should not be viewed in isolation and unrelated to the horticultural use of plants.

## Section C – Processes of Plant Physiology

**Q13** Explain the physiological processes responsible for **EACH** of the following conditions/responses:

ii) guttation;

ii) the death of a plant in a water-logged soil;

iii) an increase in plant growth resulting from burning propane gas in a greenhouse;

iv) deterioration of plant quality in a warm greenhouse over winter.

AIMS

The question was designed to test the candidates knowledge of important physiological processes. The examples i to iv were used to assess the candidates ability to relate the specific plant response to a known physiological process.

COMMENTS

The concept of guttation was explained satisfactorily, however the concept of hydathodes was not fully linked to guttation by many candidates.

The waterlogged soil was well explained in respect of the death of the plant. The actual effect of ethanol on living tissues should be explained in respect to the deterioration of plant material.

Burning propane gas provides additional carbon dioxide (a ratio of 3 kg of $CO_2$ for every 1 kg of propane gas). The increase in plant growth can only be maintained if the other factors of photosynthesis ie light, temperature and water are also increased.

The deterioration of plant quality in a warm greenhouse over the winter months is most likely to be a combination of two factors.

- Low winter light limiting the rate of photosynthesis, relatively high temperatures increasing the rate of respiration so leading to a reduced or negative carbon balance.
- Carbon dioxide may be restricted as natural ventilation may be reduced in periods of cold weather. This will reduce the photosynthetic rate but will have a limited effect on respiration. The result is elongated and often spindly growth. Another example of a negative carbon balance.

RECOMMENDATIONS

The link between major plant processes and the actual plant response is important to understand. Candidates must be able to recognize plant growth characteristics and to relate them to the environmental conditions the plant is growing within.

**Q14** a) Describe the processes of diffusion and osmosis.

b) Describe the pathways and mechanism of water movement from the soil to the leaves.

c) Describe the pathways and mechanism of movement of mineral ions from the soil to the stem apex.

AIMS

The aim of the question was to explore the concept of water and mineral ions movement within the plant. The question was designed also to assess candidates' knowledge of the pathways and the actual named mechanisms of water and mineral ion transportation.

COMMENTS

The definition of osmosis was not fully explained by many candidates. The movement of water was frequently explained as the water flow from a high to a low concentration. This only partly explains osmosis, it is important to relate it to the concentration of water or solute in the solution.

The concept of transpiration pull and water potential needs to be fully understood in order to answer this question.

Active plant absorption through the apoplastic pathway (through the cell wall) and the symplastic pathway (through the cytoplasm) needs to be fully understood by candidates.

Candidates who explained the concept of active transport, with the use of ATP/ADP interconversions, in respect to the uptake of mineral ions gained higher marks owing to the importance of this process within the plant.

RECOMMENDATIONS

Candidates should have a clear understanding of osmosis and must be able to describe this process clearly.

The transfer of mineral ions by active transport needs further study by many candidates in order to fully explain nutrient transportation within the plant.

## Section D – Knowledge of Plant Health

**Q15** a) Describe the characteristics associated with an infestation of **EACH** of the following:

i) mealy bug;
ii) scale insect.

b) Describe the life-cycle and typical host plants for **EACH** of the pests listed in a).

c) Evaluate a range of methods available for the control of **ONE** of the pests listed in a) above.

a) i) Mealy bug
Points were awarded for stating visual identification of a typical infection
Acceptable answers were;
Wax filaments, fluffy white covering, usually in leaf axils or around spines of cacti, honeydew and sooty mould present, heavy infestation weaken plants.

ii) Scale insect
Points were awarded for stating visual identification of a typical infection
Acceptable answers were;
Scales/bumps visible, seen on stems or under leaves, honeydew and sooty mould present, heavy infestation weaken plants.

b) i) Mealy bug
Looking for knowledge and understanding about the lifecycle and acceptable answers were:
Female lays batches of 100-150 eggs under wax, nymphs crawl over plants before settling to feed, sometimes winged males but more often parthenogenesis, egg to adult at 28$^{o}$C about a month, incomplete metamorphosis
Two host plants were required, with examples of accepted typical host were:
Begonias, cacti, Crassula, Hoya.

ii) Scale insect
Looking for knowledge and understanding about the lifecycle and acceptable answers were:
Female lays up to 2000 eggs under scale and then dies, eggs hatch and crawlers disperse and settle to feed on the underside of leaves, females reproduce via parthenogenesis, at 18-25$^{o}$C eggs to adults about 2 months, incomplete metamorphosis
Two host plants were required, with examples of accepted typical host were:
Laurus, Camellia, Citrus, Wisteria.

c) i) Mealy bug
Looking to show knowledge of a wide range of different control measures usable against mealy bug. Acceptable answers were:
Physical removal by cutting out colonies, washing with jets of water or use brush to remove, methylated spirits or similar can be used on a brush but may adversely affect appearance of plant, can use soil drench of systemic insecticide eg imidacloprid but may be phytotoxic to some plants, biological control with Cryptolaemus but needs temperature of 20$^{o}$C during day and may escape through vents, reduction in glasshouse temperature and humidity reduce favourable conditions.

ii) Scale insect
Looking to show knowledge of a wide range of different control measures usable against scale insect. Acceptable answers were:
Usually introduced on plants so carefully examine new acquisitions, wipe scales off leaves with a rag or brush dipped in soapy water (not suitable for flimsy leaves), contact insecticides can be used when crawlers present otherwise systemics eg imidacloprid but may be phytotoxic to some plants, in glasshouses or other enclosed spaces biological control by Metaphycus but temperature must reach 22$^{o}$C for a few hours each day, winter washes for fruit trees.

General comments:
Candidates should be careful to write their answers clearly, read the questions carefully and use the indicated marks as a guideline for their answers. This question was a popular choice amongst candidates and was generally answered well.
Section a) required brief diagnostic notes for identification of the specified pests. Some answers included irrelevant information for this section such as method of feeding, lifecycles and host plants.
Section b) required a description of the major steps in the specified pests lifecycles, also use of the correct terminology for stages in the lifecycle. Two typical host plants were required. This was required for both of the pests specified although some answered for only one.
Section c) To obtain full marks candidates needed to show knowledge of cultural, chemical, and biological methods and describe how these fit into an integrated pest management system. It was necessary to give some indication of appropriate life stages where these control measures may be appropriate.

**Q16** With reference to **EITHER** apple **OR** plum canker:

i) name the causative organism;

ii) describe the life-cycle of the selected canker;

iii) describe the symptoms of infection by the pathogen;

iv) review methods for the control of the selected canker.

| Marks | Apple Canker | Plum Canker |
|---|---|---|
| i) 2 marks | *Nectria galligena* | *Pseudomonas mors-prunorum*<br>*Pseudomonas syringae* pv. *syringae* |
| ii) 6 marks | White pustules in spring/summer<br>Produce conidia<br>Asexual spores<br>Red perithecia in autumn/winter<br>Produce ascospores<br>Sexual spores<br>Both spore types initiate infection<br>Enters via wounds/scars | Bacteria splashed from leaves<br>Enter stem, normally through leaf scars<br>Lesions extend rapidly in spring but die out in summer due to resistance<br>Bacteria to leaves in summer<br>Leaf spots with bacteria by wind or rain splash |

| | | |
|---|---|---|
| iii) 6 marks | Sunken branch lesions develop<br>Often centred on leaf scars or buds<br>Bark can be girdled<br>Creamy pustules in spring/summer<br>Red perithecia in autumn/winter<br>Russeting of fruit | Cankers on branches or crotches of cherry or main stem of plums<br>Shallow depressions<br>Amber coloured gum<br>Dark brown somewhat circular leaf spots<br>May form 'shot-holes'<br>Death of leaves causing withering |
| iv) 6 marks | Some varieties resistant<br>Eg Bramley's Seedling<br>Avoid wet, clayey sites<br>Do not over apply N fertiliser<br>Grass down under trees<br>Prune out lesions and burn<br>Use wound sealent containing fungicide<br>Avoid poplars near by<br>Spray with approved fungicide eg Bordeaux mixture | No plum or cherry resistant<br>Although some susceptible eg Victoria<br>Avoid bark damage<br>Use high-worked resistant roostock eg Myrobalan type plum or F12/1<br>Bordeaux mixture in spring may control leaf spots<br>Difficult to carry out spraying effectively<br>Spraying may lead to phytotoxicity |

General comments:
This was not a popular question amongst candidates. Those few who attempted an answer generally confused the details for the two diseases. Also, candidates should be reminded to read the questions carefully and use the marks awarded as a guideline for their answers.
Section i) Candidates were expected to have the correct Latin name of the pathogen to gain full marks. Few answered this correctly with many answering just fungal or bacterial which was insufficient to gain any marks.
Section ii) Candidates were expected to show knowledge of the different infection stages giving consideration to timings/season. This was generally completed well although candidates needed to have enough detail to account for the points on offer.
Section iii) required the characteristic diagnostic symptoms for either of the named pathogens. Marks were awarded for each of the symptoms.
Section iv) To obtain full marks candidates needed to show knowledge of cultural and chemical methods to eradicate/reduce infection and also preventative measures. It was necessary to give some indication of appropriate timing/season where these control measures may be appropriate.

General Comments for questions 15 and 16:
This was a challenging paper which is highlighted by the fact that only one candidate was able to score the maximum points for their chosen question.