Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2015

Marking Scheme

Agriculture / Horticulture

Common Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

Section One **(120 marks)**

Question 1. This is made up of eighteen parts i.e. (a) to (r).
Any 12 parts must be answered. All parts carry equal marks (10 marks each).

1. In all parts (a) to (r) any one correct point earns 6 marks and a second correct point earns 4 marks.

(a) Name the type of plant shown in the photograph.

Grass or *cereal* [accept named varieties or species]

This plant is pollinated by

Wind

(b) Plants use sunlight to produce food in a process called

Photosynthesis

What gas do plants **use** during the **night**?

Oxygen

(c) The dark-coloured material in soil formed by the decay of plants and animals is called

Humus

Give **one** reason why this organic material is important in soil.

Holds moisture/ (provides) nutrients or minerals/ neutralises pH/ improves porosity/ improves aeration/ helps to make the plant grow Any valid

(d) In designing a garden the term 'aspect' means

The direction (in which the garden is facing)

Suggest **one** reason why large trees are **not** suitable for small gardens.

Too much shade/ absorb most water/ absorb most nutrients/ potential damage to structures/ take up too much space

(e) Name the tree shown in the photograph, which provides colour in winter.

Holly

Name **one** other plant which provides colour in winter.

Haw/ sloe/ rose hip/ Any valid

(f) The common lawn weed shown in the photograph is called

Plantain

Name **one** other weed commonly found in lawns in Ireland.

Daisy/ dandelion/ chickweed/ speedwell/ Any valid

(g) Why do some shops use a mist spraying system on their fresh flower, fruit and vegetable displays?

Makes them look fresh

Suggest **one** reason why the price of flowers, fruit or vegetables can vary throughout the year.

Local v. imported/ scarcity or abundance or seasonality/ special events

(h) The structure shown in the photograph, used for the commercial production of flowers, fruit and vegetables, is called

(Poly)tunnel/ greenhouse/ hothouse

Name **one** plant care system that is automated in such a structure.

Watering/ humidity/ mineral supply/ temperature/ CO_2

(i) Give **two** ways the environment can be affected by spraying plants with insecticides.

1. *Pollution*/ poison/ fumes/ *kill 'non-target species'/ any one consequence of such killing e.g. fewer pollinators/ balance of nature disturbed*
2. Any two valid

(j) Name **one** career or job you investigated as part of your Agriculture/ Horticulture course.

Any valid career or job associated with Agriculture/ Horticulture

State **one** skill associated with the career or job referred to above.

Any valid skill associated with the career or job referred to above

(k) Suggest **two** ways in which accidents can be avoided when working in forestry.

1. *Training/ personal protective equipment (PPE)/ clear undergrowth/ maintain machinery*

2. *no unauthorised personnel/ do not work alone* Any two valid

(l) Name the tree whose seeds are shown in the photograph.

Sycamore [accept *maple*]

A tree that has black buds in winter is

Ash

(m) Name a variety of grass commonly used in silage production in Ireland.

(Italian) ryegrass

Suggest **one** reason why clover is valuable in grassland.

(Adds) nitrogen/ clover is high in nitrogen

(n) Name the poisonous plant shown in the photograph.

Ragwort/ buachalán

What is the best way of controlling this plant in grassland?

Ploughing/ pulling/ cutting/ chemical control [accept *spray/ weedkiller*]

(o) Name a notifiable disease of milk or meat producing animals.

Brucellosis/ bluetongue/ foot and mouth/ TB Any valid

Give **one** symptom of the disease referred to above.

Any symptom matching the disease referred to above

(p) This warning symbol, found on many chemical containers, means

Harmful or Irritant

Give **one** precaution you should take when working with chemicals marked with this symbol.

Wear gloves or mask or goggles/ do not eat or drink

(q) What is meant by a 'dual purpose' breed of farm animal?

Can be used for both milk and meat production

Name a dual purpose breed of farm animal.

Cattle: *MRI/ Freisian/ Simmental/ Jersey/ Dexter* Any valid

Sheep: *Californian red/ Cormo* Any valid

(r) The photograph shows a field shelter which may be used in a particular type of meat producing enterprise.

In which **type of enterprise** might such a shelter be used?

Organic or free-range [accept *pigs or calves or sheep or chickens*]

State **one** benefit of the **type of enterprise** referred to above.

No contaminants (e.g. antibiotics) in the meat / meat tastes better/ better for the environment/ better rearing conditions for animal/ less animal stress [accept *preferential feeding for juveniles*]

Section Two **(120 marks)**

Answer <u>any 4 questions</u> from the following 6 questions, which are based on the modules you have studied. All questions carry equal marks (30 marks each).

2. BASIC HORTICULTURE

(a) For seeds to germinate successfully they need a suitable temperature, water and *Oxygen* or *air* (3)

(b) Write each description from column C into column B to match an item from column A.
See shaded example.

Column A	Column B	Column C
Rake	*To gather dead leaves*	**To make holes for plants**
Secateurs	*To prune plants* (2)	**To remove weeds**
Hoe	*To remove weeds* (2)	**To gather dead leaves**
Dibber	*To make holes for plants* (2)	**To prune plants**

(c) State the purpose of **each** of the following additives in a potting compost:

Vermiculite. *Improves aeration* or *retains moisture* or *retains nutrients* (3)

Sand. *Improves drainage* or *improves aeration* or *aids root development* (3)

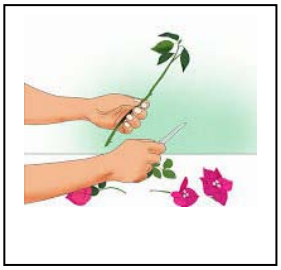
Slow release fertiliser. *Provides nutrients over a long period of time* [accept *it helps plants to grow*] (3)

(d) The pictures A, B, C and D below show steps in the taking of a stem cutting but they are not in the correct order.

A

B

C



D

Write the above letters in the correct order for the taking of a stem cutting.

Step 1. *B* (1) Step 2. *D* (1) Step 3. *A* (1) Step 4. *C* (1)

Describe in detail how to take a stem cutting by describing what is happening in each of the steps shown.

Step 1. *Cut off side shoot at an angle* or *at new growth* or *where non-woody* or *10 to 15cm long* (2)

Step 2. *Remove all lower leaves/ remove dead leaves or remove buds or remove flowers*

[*accept cut stem at angle* if not relied on above] (2)

Step 3. *Dip stem in water/ tip some powder out of container/ dip cut end in rooting powder/ tap off excess powder* (2)

Step 4. *Cover with plastic/ to stop water loss* (2)

3. GARDEN DESIGN

(a) Garden shrubs provide colour using their flowers, foliage and *Stems* or *buds* or *fruit* (3)

(b) Indicate whether the following statements are true or false, by ticking ✓ the correct box in each case.

- Formal gardens have a symmetrical design True ✓ False ☐ (2)
- A patio is a hard landscape feature True ✓ False ☐ (2)
- Trees or flower beds should never be in the centre of a lawn True ✓ or False ✓ (2)

(c) The photographs below were taken before and after the planting of a tree.

Before planting **After planting**

Write a brief description of each of the following steps in the planting of a tree.

Digging and preparing the hole. *Dig hole deep enough/ dig hole wide enough/ loosen soil in the base and sides of the hole/ add in fertiliser or compost/ water in the hole* (3)

Preparing the root ball. *Gently remove pot, plastic or sacking/ soak root ball in water* ***or*** *do not allow root ball to dry out/ loosen large roots/ do not break up root ball* (3)

Supporting the tree. *Place the tree in the hole/ drive a stake into the ground beside the tree/ fill in the remaining spaces with soil or compost/ firm in carefully/ tie the tree to the stake/ using flexible ties/ leave a space between tree and stake* (3)

(d) This photograph, taken at mid-day, shows a house with most of its garden to the front.

Identify **two** problems with this garden layout and suggest how the layout might be improved in **each** case.

Problems. *Trees too close to house/ blocking the light/ central path un-interesting/ path splits garden, restricting use/ most of garden to the front of the house/ lacks features*

Any two valid (2 + 2)

Suggested improvements. *Cut or trim trees/ remove trees/ vary path layout/ add features/ extend garden to back*

Any two valid (2 + 2)

In what direction is the front of the house facing?

West (2)

Indicate, by placing an **X** on the photograph, the best place to locate a patio and barbecue area.

Most of letter X must be in the sunny spot (1)

Give a reason why you have chosen this location for the patio and barbecue area.

Aspect/ convenience/ sunny/ privacy (1)

4. FLORISTRY, FRUIT & VEGETABLES.

(a) A beer trap is used for the organic control of *Slug* or *snails* [accept *pests*] (3)

(b) Complete the sentences below using the most suitable terms from the following list.

List: **Hose** **Cloche** **Less than 7** **Fungicide** **Mulch** **More than 7**

- An early crop can be grown using a *Cloche* (2)
- Most crops are grown in soil whose pH is *More than 7* (2)
- Weeds in crops can be controlled using a *Mulch* (2)

(c) In your study of Floristry**,** Fruit and Vegetables you looked at ways in which flowers **or** fruit **or** vegetables can contribute to our health and wellbeing.

Describe **three** ways in which flowers **or** fruit **or** vegetables can contribute to our health and wellbeing.

Any three valid points referencing contribution to our health and wellbeing of flowers or fruit or vegetables (3 +3 + 3)

Hobbies such as gardening or preserving or arranging/ herbal medicines/ fragrances/ part of diet/ aesthetic appreciation/ supply vitamins or minerals/ low fat/ fibre/ "five-a-day"

(d) The table below gives information on the value of flower, fruit and vegetable production between 2004 and 2007.

Sector	2004 € millions	2007 € millions	Change from 2004 to 2007
Mushrooms	114.5	97.4	- 15%
Field vegetables	56.7	63.3	+12%
Protected crops	36.8	45	+ 22%
Fruit crops	8.9	8	- 10%
TOTAL	**216.9**	**213.7**	**- 1.5%**

Suggest **two** reasons for the decline in total value between 2004 and 2007.

1. *Higher energy costs/ lower prices or cheaper/ higher labour costs/ lower margins/ imports or increased competition*

2. *Weather/ fewer people buying them/ people grow their own* Any two (2 +1)

Suggest **two** reasons for the increase in the value of 'Protected crops' between 2004 and 2007.

1. *Extension of the growing season/ higher yields/ all year round production/ weather/ independent of weather for production or for maintenance or for harvesting* Any two (2 + 1)

Identify **one** challenge to the continued growth in the production of flowers, fruit and vegetables in Ireland.

Climate change/ pests or diseases/ high production costs/ cheaper imports/ higher labour costs/ availability of labour/ lack of opportunity to rotate crops/ weather (3)

Why is a healthy bee population important to the floristry, fruit and vegetable industry?

Pollination (3)

5. FORESTRY

(a) A coniferous tree which sheds its leaves in winter is the _____ *Larch* _____ (4)

(b) Match each word in column A with a description from column B to give an answer in column C. **See shaded example.**

Column A	Column B	Column C
1 Evergreen	**a Uppermost branches and leaves of a tree**	**1 + c**
2 Trunk	**b The circumference of a tree trunk**	*2 + d* (3)
3 Crown	**c Does not lose all its leaves in winter**	*3 + a* (3)
4 Girth	**d Main woody stem of a tree**	*4 + b* (3)

(c) Identify the weather recording instruments shown in the photographs below.

A

B

C

A. *(Campbell-Stokes) sunshine recorder* [all candidates who attempt Q.5 get the marks here]

B. _____ *(Wet and dry bulb) thermometer* _____

C. _____ *(Aneroid) barometer* _____ (5,3,1)

Give **one** reason why Ireland is a good place for the growth of coniferous forests.

Mild or moist or temperate or suitable climate/ not too cold/ longer growing season

(than competitors)/ coniferous trees grow quickly in Ireland _____ (4)

(d) Seeds of some trees from different parts of the world will only germinate if they are exposed to certain environmental conditions.
Suggest four such environmental conditions that might be necessary for these seeds to germinate.

Suggested environmental condition 1. *(Very) high temperatures* (1)

Suggested environmental condition 2. *(Very) cold temperatures* (1)

Suggested environmental condition 3. *(Very) bright light* (1)

Suggested environmental condition 4. *(Very) wet conditions* (1)

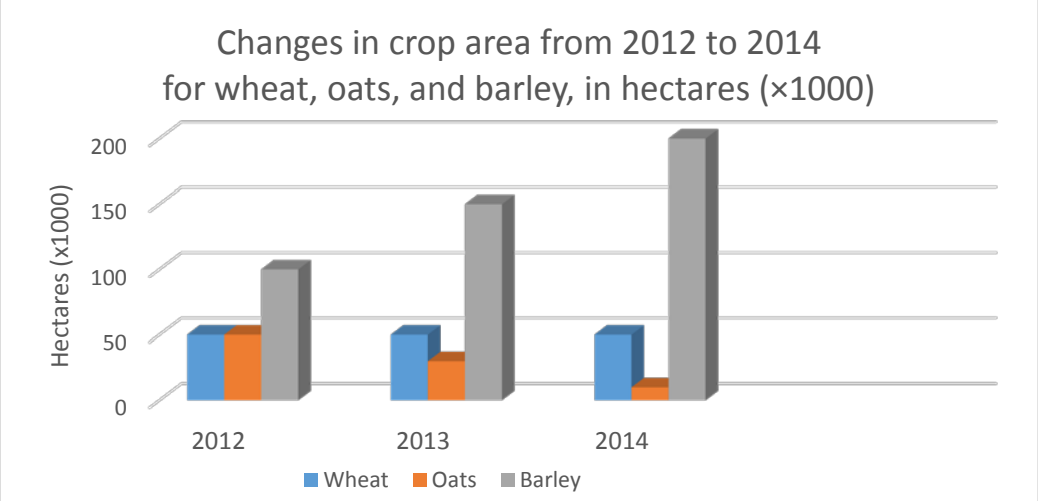
6. GRASS

(a) Name a method used to drain grassland. *Mole drain* or *gravel drain* or *piped drain* or *open drain* (3)

(b) Indicate whether the following statements are true or false, by ticking ✓ the correct box in each case.

- The buttercup plant is important for healthy grass — True ☐ False ☑ (2)
- Acid is often used in the conservation of grass — True ☑ or False ☑ (2)
- Scutch grass is a weed — True ☑ False ☐ (2)

(c) The chart below shows changes in crop area for wheat, oats, and barley from 2012 to 2014.



Use the above chart to answer the following questions.

Which crop shows the **greatest increase** in crop area over the time period shown? *Barley* (3)

Which crop shows the **greatest decrease** in crop area over the time period shown? *Oats* (3)

Suggest **two** reasons why crop area decreases for some crops.

Reason 1: *Decreased demand for the crop/ fall in profits/ crop less suited to changing climate/ farmer switches to a different crop*

Reason 2: Any two (2 +1)

(d) The photograph below shows a machine used in the conservation of grass.

This machine is called a ___(*Forage* or *silage) harvester* (1)

What does this machine do in the conservation of grass?

Cuts grass/ chops grass/ blows grass into trailer or picks up grass/ monitors grass or silage quality or yield Any two (1 + 1)

_____

Name **two** other pieces of machinery used in conserving grass and describe what each one does.

Names of pieces of machinery. *Mower/ rotor rake or tedder or turner/ round baler/ square baler/ bale wrapper/ bale transporter/ loader* Any two (2 + 2)

Work done. Correct points to match the named pieces of machinery (1 + 1)

_____

Name of piece of machinery 2. _____

Work done. _____

_____

Give **two** safety precautions you should take when working with these machines.

1. *Machine maintenance/ all guards in place/ PTO shaft covered/ no overloading/ no unauthorised personnel/ reversing siren/ earplugs/ masks/ PPE/ tie up hair/ pull up sleeves*

2. Any two valid (2 + 1)

7. MILK AND MEAT PRODUCTION

(a) Red meat is rich in the mineral *Iron* or *zinc* (3)

(b) Match each animal in column A with its description in column B to give an answer in column C. **See shaded example**

Column A	Column B	Column C
1 Calf	**a Young pregnant female**	**1 + d**
2 Bullock	**b Young female**	*2 + c* (2)
3 Springer	**c Young castrated male**	*3 + a* (2)
4 Heifer	**d Newborn**	*4 + b* (2)

(c) The photograph shows an animal housing unit being built.

What structure is visible in the foreground (front part of the photograph)?

Slatted slab/ slurry pit (2)

What is the purpose of this type of structure in an animal housing unit?

Slurry storage/ cleanliness/ slurry removal can be mechanised or automated/ more environmentally friendly/ low maintenance/ fewer hoof problems Any two (2 + 1)

Give **one** danger associated with this type of structure. *Slat failure or could fall in/ harmful gas (H_2S)/ foot gets caught/ foot slips through* (2)

How should a farmer deal with this danger? *Regular inspection/ timely repairs/ good design/ good materials/ agitate slurry in windy weather or with house empty or with all doors and vents open/ close lids* (2)

(d) During your study of the Milk and Meat Production module you visited a farm. Describe what you learned during your visit, using the following headings as a guide.

Good design of animal housing.

Spacious cubicles/ sloping cubicle floor/ cubicle raised from the passage way/ good headroom/ good ventilation/ large feed troughs/ easily accessible feed troughs/ no sharp edges or corners/ good natural or artificial light/ gas or fire alarm system

(3)

Arrangements for feeding animals.

Spacious cubicles/ sloping cubicle floor/ cubicle raised from the passage way/ good headroom/ good ventilation/ large feed troughs/ easily accessible feed troughs/ no sharp edges or corners/ good natural or artificial light/ use a diet feeder/ feed at same time each day.

(3)

Hygiene and the prevention of disease.

Check purchased animals are free from disease or *quarantine bought-in animals/ take care with animal transport/ limit wild animals and vermin/ proper fencing/ isolate sick animals/ cleaning method/ cow mats/ cow shoes/ good management practices/ limit access by people/ use boot or foot baths at entrances* (3)

Breeding good quality animals.

Importance of research/ maintain good records/ high quality feed/ use of AI/ use of embryo transfer/ good quality replacements (3)