

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2016

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).

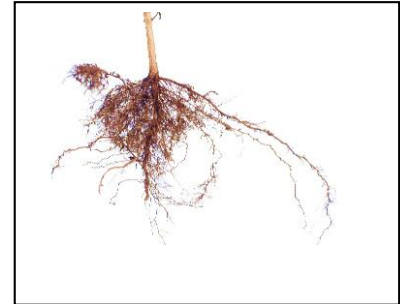
Any one correct sub-section of a part earns 8marks.

1. (a) Name the part of the plant shown in the photograph.

Root

This structure anchors the plant, absorbs water and

Minerals or vegetative propagation or food storage



- (b) Seeds start to grow into young plants in a process called

Germination [accept sprouting]

What gas does the seed need to start this process?

Oxygen or O₂ [accept O]

- (c) Farm animals can spend a lot of time in housing during the year.

An advantage of housing animals is Warmer/ safer/ easier to manage/ faster growth/

easier to check/less damage to land

A disadvantage of housing animals is

Spread of disease / lack of hygiene / waste management/ cost

- (d) Name a modified stem which is widely grown in Ireland as a foodstuff. Potato

What feature shows that it is actually a stem? Eyes or buds

- (e) Name the tree shown in the photograph.

(Silver) birch

Suggest why this tree is often planted in groups.

Greater visual impact/ to fill a gap/ slows growth



- (f) The hard landscape feature shown in the photograph is a Sundial

From what material could this hard landscape feature be made?
Rock/ concrete/ plastic/ metal



- (g) Suggest **two** reasons why imported flowers, fruit and vegetables are still in good condition when they are put on sale in shops.

1. Harvested prior to ripening/ transported quickly/ transported chilled/ stored chilled
2. (any two)

- (h) Flowers, fruit and vegetables are important for our wellbeing and health. Name **two** ways in which flowers **or** fruit **or** vegetables contribute to our wellbeing and health.

1. Vitamins/ minerals/ fibre/ anti-oxidants/ low calories/ relaxing scent/ visual impact
2. (any two)

- (i) The flattening of cereal crops by wind and rain is called lodging

What effect does this flattening have on cereal crops?

Difficult to harvest/ high water content/ crop rots/ reduced yield

- (j) Name a coniferous tree commonly used in forestry in Ireland.

(Douglas) fir/ (lodgepole) pine/ (Sitka) spruce

Why are forests mainly located in upland areas?

Poor agricultural land



(k) Suggest **two** ways in which coniferous and deciduous trees differ from each other.

1. Coniferous vs Deciduous:

Narrow leaves [accept needles] vs broad leaves

Don't lose leaves in winter vs lose leaves

Obvious flowers vs less obvious flowers

2. (any two differences)

(l) Name the weather instrument shown in the photograph.

Rain gauge

Why is the Irish climate very suitable for commercial forestry?

Wet



(m) What does a pH test indicate about soil?

Whether it is acidic, basic, or neutral

In what way does the addition of lime affect the pH of the soil in an area of grassland?

pH is increased/ soil becomes more alkaline

(n) Name the piece of farm machinery shown in the photograph.

(Round) baler

Suggest a reason why hay or silage does **not** rot.

Hay: dry

Silage: preserved by acid (either answer)



(o) Name **two** maintenance tasks to be carried out on a lawn during the growing season.

1. Fertilising/ weeding/ aerating/ mowing/ raking/ top dressing or any valid task

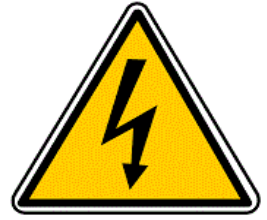
2. (any two)

(p) What danger is indicated by this safety sign?

Electricity/ high voltage

Where on a farm might you see this safety sign?

Pylons/ electricity poles/ appropriate machine/ transformers



(q) Suggest **one** advantage **and one** disadvantage associated with the intensive farming of animals.

Advantage:

Food produced more cheaply/ more profit/ economy of scale/ volume for sale

Disadvantage:

Disease/ stressed animals/ environmental impact/ use of chemicals/ more waste/

increased cost

(r) Identify the piece of farm machinery shown in the photograph.

Slurry tank/ spreader

In what type of weather conditions should this farm machine **not** be used?

Wet/ strong winds/ frost



Answer any 4 questions 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) Phloem is a vascular tissue in plants, which transports *Food/ starch/ sugar* (3 marks)
- (b) Write each statement from column C into column B to match a word in column A. See shaded example.

Column A	Column B	Column C
Sterilise	<i>To kill fungi in soil</i>	Growing plants without soil
Sand	<i>Improves drainage in compost</i> (2 marks)	To kill fungi in soil
Perlite	<i>Retains water in compost</i> (2 marks)	Improves drainage in compost
Hydroponics	<i>Growing plants without soil</i> (2 marks)	Retains water in compost

- (c) New plants can be propagated by a variety of methods. Briefly explain how each of the following propagation methods is carried out.

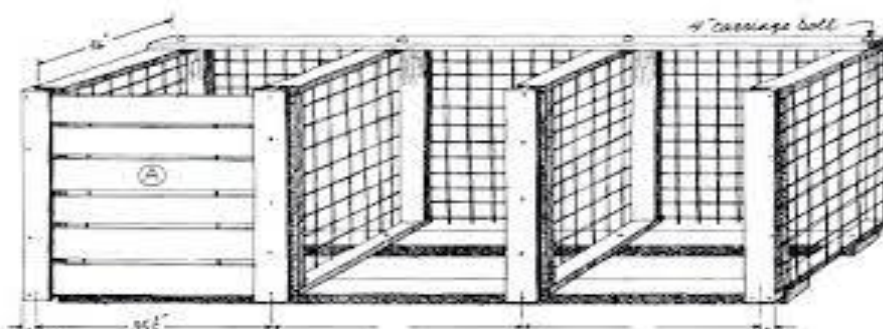
Cuttings. Section of new growth/ cut below the node/ clean cut or use secateurs/ treat with hormone or rooting powder/ plant in sand or free-draining compost/ cover container to reduce water loss

Runners. Pin down runners/ in contact with soil/ with pin or wire/ plantlets develop/ separate plantlets

Dividing. Divide when plant is low/ cool cloudy day/ dig around plant/ dig into plant/ divide into pieces/ each piece having some root and some shoot

(3 + 3 + 2 + 1, with a maximum of two points for any and at least one point from each propagation method)

(d) The diagram shows a design for a garden composter made from wood and wire mesh.



What type of garden waste can be placed into this composter?

Grass cuttings/ hedge clippings/ dead leaves/ rotten vegetables (any two items 2+1 marks)

What type of garden waste should **not** be placed into this composter?

Items treated with pesticides or weed killer/ cat or dog litter/ woody materials/ weeds with underground stems/ items that will not rot

(any two items 2+1 marks)

Suggest **two** advantages of this design for a garden composter.

Advantages. Plenty of air/ easily accessible/ when one section is full another is available compost can be turned easily/ removed easily/ cheap to make

(any two 2+1 marks)

Suggest **two** disadvantages of this design for a garden composter.

Disadvantages. Accessible to vermin/ exposed to rain or to frost/ materials are not

long lasting/ requires a large space/ it is not portable/ no cover (any two 2+1 marks)

3. GARDEN DESIGN

(a) The first step in designing a garden is drawing up a Sketch or plan (3 marks)

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

- A path should always be in the centre of a garden True False 2✓
- Alpine plants are usually grown in a rockery True False
- Raised beds are ideal for older or disabled gardeners True False

(2+2+2 marks)

(c) The picture shows bulbs and corms planted in a pot.



Suggest a reason for planting the bulbs and corms in layers. _____

Bulbs need to be planted at different depths/ bulbs will grow and flower in sequence/ gives

flowers over a longer period of time (any valid point 3 marks)

What does the term 'forcing' mean when growing bulbs?

Allows plant to flower earlier/ keeping bulbs in cold dark conditions/ forces the flower to

develop before the leaves (any valid point 3 marks)

Why do bulbs and corms **not** need fertiliser until after they have flowered?

The bulb is a store of food for the plant/ fertiliser is needed for new bulb development after

the bulb has flowered (any valid point 3 marks)

(d) The photograph below shows a garden surrounded by a high wall.



Suggest whether the design of this garden is formal **or** informal. Formal garden (1 mark)

Give a reason for your answer.

Paths dominate/ symmetrical/ clipped hedges and trees/ walled/ use all year round / neat/ straight lines/ good order (any one point 2 marks)

Give **two** advantages that a walled garden would have over a garden without such a wall.

Shelter/ frost reduced/ micro climate/ privacy/ warmer/ plants safer/ greater variety of plants possible. Any two valid points (2+1 marks)

Suggest a feature that could be placed in the centre of this garden.

Sculpture/ specimen tree/ pergola/ fountain (any valid point 2 marks)

Name a shrub that would make this garden more attractive in winter.

Any named shrub with coloured; foliage/ stems/ berries/ variegation (2 marks)

Name **one** feature of this garden that makes it suitable for elderly or disabled visitors.

Regular layout/ wide paths/ level paths/ confined area (any valid point 2 marks)

4. FLORISTRY, FRUIT & VEGETABLES

- (a) What type of farm produce is promoted by IOFGA? Organic (3 marks)
- (b) Complete the sentences below using the most suitable words from the following list.

List: Potassium Greenfly Weeds Iron Vermin Bee

- An important insect in the pollination of food crops is the Bee (2 marks)
- Flowers, fruit and vegetables need lots of the mineral Potassium (2 marks)
- Herbicides are important in the control of Weeds (2 marks)

- (c) In your study of the production of flowers **or** fruit **or** vegetables you investigated growing, harvesting, transport and retailing.

What methods of investigation did you use to gather information from the flower **or** fruit **or** vegetable producer?

Any two methods of collecting information (2+1 marks)

What did you learn about the harvesting of the flowers **or** fruit **or** vegetables?

Any two valid points relating to the harvesting and packaging (2+1 marks)

How were the flowers **or** fruit **or** vegetables graded?

Size/ shape/ variety/ colour (2+1 marks)

(d) The photographs below show three structures that are used to extend the growing season.



A



B



C

Name the **three** structures A, B, and C.

A. Greenhouse/ glasshouse (1 mark)

B. (Poly)tunnel (1 mark)

C. Cloche (1 mark)

Briefly explain how these structures extend the growing season.

Protect from: wind/ slight frost/ insects/ cold (any similar point 3 marks)

What improvements or additions could be made to the structures shown in photographs A and B above that would provide better protection for plants in very cold weather?

Greenhouse heaters/ lamps which switch on in cold weather/ compost releasing heat/

heatsink e.g. barrel of water/ fleece (or any similar point 3 marks)

Some commercial growers slightly increase the amount of carbon dioxide (CO₂) in the air in some of the above structures. Suggest a reason why this is done.

More photosynthesis (3 marks)

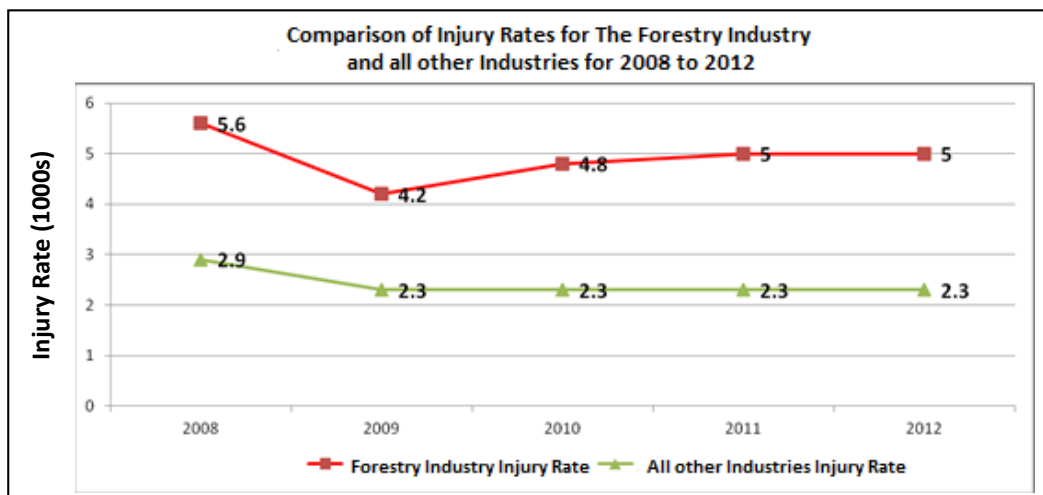
5. FORESTRY

(a) Name a coniferous tree that loses its leaves in winter. Larch (3 marks)

(b) Match each term 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 Girth	a 'Roof' of the forest	1 + c
2 Annual ring	b Outermost layer of the tree trunk	2 + d (2 marks)
3 Canopy	c Circumference of a tree trunk	3 + a (2 marks)
4 Bark	d One light and dark band combined	4 + b (2 marks)

(c) The chart below shows injury rates for the forestry industry (—■—) compared to injury rates of all other industries (—▲—) from 2008 to 2012.



What does the chart show about injury rates for the forestry industry when compared to injury rates for all other industries?

There is a far higher number of accidents in forestry (3 marks)

Suggest a reason why there was a reduction in injury rates in the forestry industry and all other industries in 2009.

Safety awareness campaign/ new safety legislation/ any relevant point (3 marks)

Name **two** pieces of personal protection equipment (PPE) that forestry workers should wear.

Steel capped boots/ safety trousers/ safety gloves/ high visibility jacket/ rip resistant jacket/

safety helmet/ ear muffs/ goggles (2+1 marks)

- (d) In Ireland there are different views as to the role of forestry. From your study of this module comment briefly on each of the following statements.

Forestry should only be there to make as much money as possible from the timber.

Any reasonable comments or points for or against the argument (2+1 marks)

Forests have no amenity value.

Any reasonable comments or points for or against the argument (2+1 marks)

Coniferous forests are not good areas for supporting wildlife.

Any reasonable comments or points for or against the argument (2+1 marks)

Clearfelling of forests has little or no impact on the environment.

Any reasonable comments or points for or against the argument (2+1 marks)

6. GRASS

(a) Grass flowers are pollinated by Wind (3 marks)

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

- The flower part of a grass plant is called a spikelet True False
- Grass plants produce seeds by the process of tillering True False
- The foxglove is a poisonous plant True False

(2+2+2 marks)

(c) The pictures show **three** types of weedkiller for home or farm use.



A



B



C

Picture A shows a **systemic** weedkiller. Explain the term **systemic** in relation to weedkillers.

The weed killer travels throughout the plant killing all parts or similar answer (3 marks)

Picture B shows a **selective** weedkiller. Explain the term **selective** in relation to weedkillers.

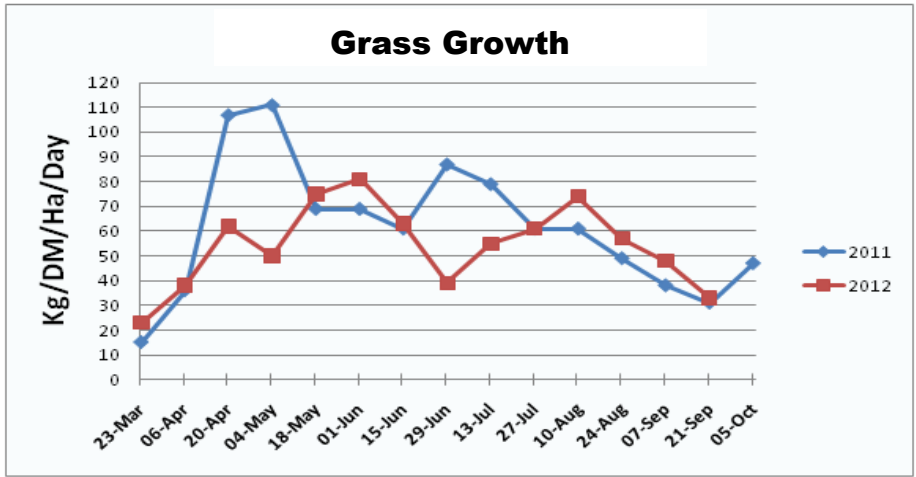
It kills certain weeds and does not affect other plants/ kills broadleaved plants but not grasses or cereals (3 marks)

Picture C shows a **residual** weedkiller.

Suggest a reason why **residual** weedkillers are being phased out for farm use.

Because they poison the soil preventing growth and could stay in the soil for years (3 marks)

(d) The chart below shows grass growth from March to October in 2011 (◆) and in 2012 (■).



Briefly describe the pattern of grass growth from early April to late August in 2011.

Identify at least two alterations in the graph linked with a specific date span

(2+2 marks)

Suggest a reason for the sudden drop in the growth of grass in June 2012.

Wet weather/ cold weather/ drought/ over grazing/ close mowing

(any one point 4 marks)

Which year was the better year for grass growth? 2011 (2 marks)

Give a reason for this answer.

More growth in April and late June/ early July. (2 marks)

7. MILK AND MEAT PRODUCTION

(a) Which vitamin is removed from milk by pasteurisation? Vitamin C (3 marks)

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

Column A	Column B	Column C
1 Slurry	a High iron content	1 + c
2 Red meat	b High fat content	2 + a (2 marks)
3 Milk	c High nitrogen content	3 + d (2 marks)
4 Cream	d High calcium content	4 + b (2 marks)

(c) The photographs show **two** different breeds of cattle.



A



B

Name the breed shown in each of the photographs.

A. Hereford B. Holstein/ Friesian (2+1 marks)

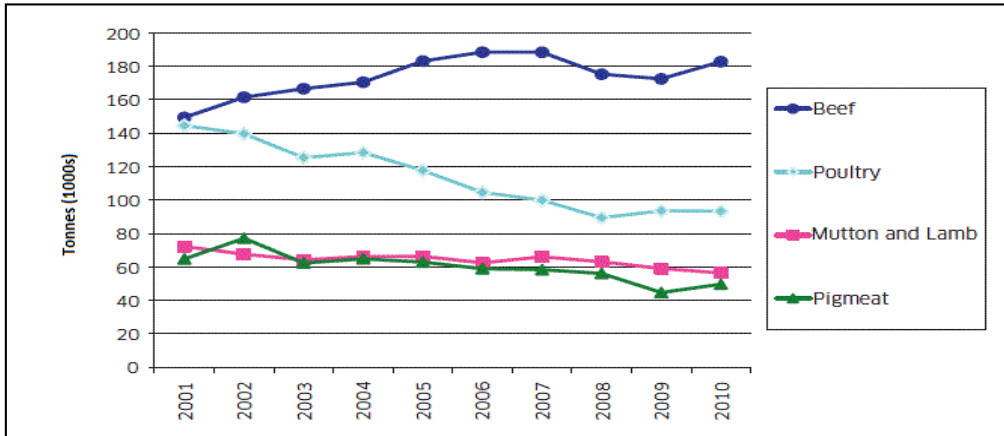
What is meant by a dual purpose breed?

The animal can be used to produce either milk or meat (3 marks)

Suggest a reason why farmers use a dual purpose breed.

It gives farmers flexibility/ can produce store cattle/ produce milk/ cows feed calves/ sell calves (3 marks)

(d) The chart below shows the production of meat from 2001 to 2010.



Suggest a reason for the decline in **poultry** production from 2001 to 2008.

Food scare/ disease/ cheaper imports from abroad/ consumer change to beef/ less profitable for producer (any reasonable point 3 marks)

What controversy was associated with meat products in recent years?

E. coli/ BSE/ horsemeat/ hormones/ salmonella (any one 3 marks)

Why is the use of hormones banned in meat production in the European Union?

Any reasonable point in relation to human health. Hormones banned as a result of consumer demand arising from health scares (3 marks)

Describe the system that is now in place to assure consumers that meat is of a good quality.

Bord Bia quality assurance schemes/ farm and animal traceability scheme ("farm to fork")/ genetic testing of meat products/ strict licencing of processors and all those associated with meat production and processing (any relevant point 3 marks)
