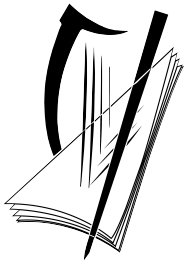

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2018

Marking Scheme

Agricultural Science

Ordinary 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.

Introduction

General points

- The marking scheme is a guide to awarding marks.
- Examiners must conform to this scheme, and may not allow marks for answers outside the scheme.
- In many cases only key phrases are given in the marking scheme. These points contain the information and ideas that must appear in a candidate's answer in order to merit the assigned marks.
- The descriptions, methods and definitions given in the marking scheme are not exhaustive and alternative valid answers are acceptable.
- If an examiner determines that a candidate has presented a valid answer, and where there is no provision in the scheme for accepting that answer, then the examiner must first consult with his/ her advising examiner before awarding marks. In general, if an examiner is in any doubt whether a particular answer is correct he/ she should consult their advising examiner before awarding marks.
- The detail required in any answer is determined by the context, the phrasing of the question, and by the number of marks assigned to the answer in the examination paper. This may vary from year to year.
- Words, expressions or statements separated by a solidus (/) are alternatives which are equally acceptable for a particular point. A word or phrase given in brackets is an acceptable alternative to the preceding word or phrase. Note, however, that words, expressions or phrases must be correctly used in context and not contradicted and where there is evidence of incorrect use or contradiction, the marks may not be awarded.
- In general, names and symbols/ formulae of elements/ compounds are equally acceptable. However in some cases where a name is specifically asked for, the symbol/ formula may be accepted as an alternative. This will be clarified within the scheme.

Cancelled answers

- If the only answer offered is cancelled ignore the cancelling and mark as usual.
- If an answer is cancelled and a second version of the answer is given, you should accept the cancellation and award marks, where merited, for the un-cancelled version only.
- If two un-cancelled versions of an answer are given to the same question or part of a question, mark both and accept the answer that yields the greater number of marks. You may not, however, combine points from both versions to arrive at a manufactured total.

Surplus answers

- In Section One, a surplus wrong answer cancels the marks awarded for a correct answer.

  e.g. Question: Choose two dairy breeds from the following list of cattle breeds:

  List: Charolais Friesian Simmental Jersey Hereford

  Marking scheme: Friesian/ Jersey/ Simmental **Any two 2(1)**

  Answer: Friesian, Jersey, and Hereford.

  The surplus answer (Hereford) is incorrect,
  Therefore the candidate scores 2 – 1 = 1 mark.

Conventions

- The mark awarded for an answer appears in the marking scheme next to the answer on the right hand side.
- Where there are several parts in the answer to a question, the mark awarded for Each part appears as e.g. **3(4)** marks. This means there are three parts to the answer, each part allocated 4 marks.
- Award unit marks separately;
  e.g. if an answer merits three 3-mark units, write: 3
  3
  3 in the first column in the right-hand margin of the answer book.
- The answers to subsections of a question may not necessarily be tied to a specific mark e.g. there may be three parts to a question - (i), (ii), (iii) and a total of 12 marks allocated to the question. The marking scheme might be as follows: **6 + 3 + 3**. This means that any first correct answer is awarded 6 marks and each subsequent correct answer is awarded 3 marks.
- Square brackets and/ or *italics* are used where the examiner's attention is being drawn to an instruction relating to the answer or to some qualification of the answer.
- The total mark for each question should be written beside the question number, and circled.
- The cumulative total should be written in the bottom right-hand corner of each page on which a question total appears.
- All blank pages should be marked to indicate they have been inspected.

Section One

Question 1. 10 + 6 + 4(1)

(a)	(i) S*oil component at A:* Humus **or** organic matter **or** living organisms (or named example e.g. earthworm) (ii) *Principal soil particle type in B:* Clay (iii) 1. *Type of drainage:* Good 2. *Explanation:* Large amount of sand
(b)	*Reasons for poor drainage:* High clay content or low sand content/ impervious parent material/ iron pan (or hard pan or plough pan)/ soil compaction/ poor soil structure/ poaching damage ***Any two***

Question 2. 10 + 6 + 4(1)

	Pig	*Sheep*
Length of gestation	3 months, 3weeks, 3days (or 110 – 120 days)	5 months (or 145 – 155 days)
Mass of offspring at birth (kg)	1 – 1.5 kg	3 – 5 kg
Slaughter mass (kg)	75 – 90 kg	35 – 50 kg

Question 3. 8 + 7 + 5(1)

(a)	*Liver fluke's primary host:* Sheep
(b)	*Secondary host:* Mud snail (or freshwater snail or *Limnaea truncatula*) [*allow* snail]
(c)	*Practices to reduce liver fluke incidence:* Drainage/ fencing off wet areas/ remove livestock from risky areas/ apply lime/ ducks and-or geese/ molluscicides/ dosing/ injection or vaccination or pour on ***Any three***
(d)	*Endoparasite:* A parasite that feeds on the inside of the host (or named host) **or** an organism that harms another living organism
(e)	*Another example of endoparasite:* Roundworm **or** stomach worm **or** lungworm **or** Babesia **or** tapeworm **or** potato bight

Question 4. 12 + 8(1)

(a)	*Parts of stomach:* *A:* Rumen *B:* Reticulum *C:* Omasum *D:* Abomasum
(b)	*Role of A:* To digest cellulose **or** to digest roughage (or named roughage) **or** to store food **or** contains bacteria **or** makes vitamins **or** makes protein **or** mixes food *Role of D:* Produces gastric juice **or** produces enzymes (or named enzyme e.g. pepsin) **or** digests protein **or** produces (hydrochloric) acid **or** lowers pH of food **or** chemical digestion (of food) **or** digestion similar to true stomach
(c)	*Farm animals with ruminant stomach:* Sheep/ cattle/ goats/ deer ***Any two***
(d)	*Advantage of ruminant stomach:* Animal can digest bulky foods (or named bulky food) **or** animal can digest roughage (or named roughage) **or** animal can digest cellulose **or** animal can make (essential) amino acids **or** animal can make protein

Question 5. 5(3) + 5(1)

(a)	*Cotyledons store food in seeds*	T
(b)	*Grasses in family Compositae*	F
(c)	*Earthworms are parasites*	F
(d)	*Resazurin solution used to test hygienic quality of milk*	T
(e)	*Vena cava takes blood away from heart*	F
(f)	*Granite is an igneous rock*	T
(g)	*Aphids (greenfly) spread viral diseases*	T
(h)	*Respiration is loss of water vapour from stomata of leaves*	F
(i)	*Footrot is a notifiable disease*	F
(j)	*Hereford is a dairy breed of cattle*	F

Question 6. 8 + 6 + 3(2)

(a)	*Parts of grass flower:* *A:* Filament [*allow* stamen] *B:* Stigma [*allow* carpel] *Role of C:* To make pollen **or** to make male gamete (or sperm) **or** pollination
(b)	*Features of grass flowers suitable for wind pollination:* Anther (or stamen) hangs outside flower/ stigma (or carpel) hangs outside flower/ stigma feathery/ large anther/ pollen light/ pollen smooth/ large amount of pollen/ large stigma ***Any two***

Question 7. *Scientific reasons* **8 + 6 + 3(2)**

(a)	*Finding soil pH before sowing:* Determines if pH at optimum level for crop **or** determines if lime required **or** determines amount of lime required
(b)	*Adding white clover to seed mixture:* Nitrogen fixation **or** rich in protein **or** rich in minerals (or named mineral) **or** ground cover **or** weed control **or** increases palatability **or** increases productivity (of sward) **or** high digestibility
(c)	*Topping pastures:* Increases tillering **or** promotes leafy growth **or** removes stemmy growth **or** weed control **or** increases grass growth **or** increases yield of grass
(d)	*Using mineral licks:* Provides mineral (or named mineral) **or** prevents mineral deficiency (or named mineral deficiency disease) **or** to supplement poor diet
(e)	*Isolating sick animals:* Prevents spread of disease **or** facilitates treatment of sick animal **or** ease of access to sick animal **or** can check sick animal easily

Section Two

Question 8.

(a)	(i) *Differences between composition of slurry and FYM:* *Slurry* — *FYM* More water — Less water No straw — Contains straw More N — Less N Less P — More P Liquid — Solid Low in organic matter — Rich in organic matter ***Any two***	**2(4)**
	(ii) *Steps to reduce water pollution by slurry:* Correct application rate/ do not spread during wet weather/ do not spread on frozen ground/ do not spread close to waterways/ covered slurry tank/ store slurry in leak-proof tanks/ use injection system of application ***Any two***	**2(4)**
(b)	(i) *Elements in 18-6-12:* Nitrogen Phosphorus Potassium [*allow symbols* i.e. N P K]	**3(4)**
	(ii) *Advantage and disadvantage of artificial fertilisers:* *Advantage:* Specially formulated for each crop **or** farmers knows the amount of nutrient(s) that has been applied to crop **or** fast-acting **or** may have a combination of fast and slow acting ingredients **or** easily absorbed by crop **or** less bulky **or** easy to transport **or** easy to apply **or** less odour *Disadvantage:* Expensive **or** may burn crop if too much applied **or** may cause pollution **or** easily washed out of soil	**4**
	(iii) *Role of one element in 18-6-12:* *Nitrogen:* Formation of chlorophyll (or green colour) **or** prevents chlorosis **or** increases yield **or** protein formation **or** promotes leafy growth **OR** *Phosphorus:* Necessary for cell division **or** for energy transfer in cells **or** seed germination **or** promotes root growth **or** enhances seed formation **OR** *Potassium:* Necessary for protein formation **or** helps in disease prevention **or** promotes healthy growth **or** promotes early ripening **or** enhances fruit quality	**4** **4**
(c)	*Experiment to measure % water content in soil:* Mass of empty (evaporating) basin (or dish) [*allow* place soil in basin]/ find mass of dish + (fresh) soil/ subtract to find mass of soil/ place basin + soil in oven at 80 – 100 °C (or place basin in oven for 24 hours)/ re-weigh to find mass dry soil/ repeat until constant mass/ subtract to find loss in mass/ calculate % water content using: $\frac{\text{mass of water}}{\text{mass of (fresh) soil}} \times \frac{100}{1}$ / repeat to obtain average ***Any five*** [*Some or all marks may be obtained from labelled diagram(s)*]	**5(4)**

Question 9.

(a)	(i) *Maincrop potato varieties:* Rooster/ Kerr Pink/ Golden Wonder/ Record/ Cara/ Maris Piper/ Pentland Dell ***Any two*** (ii) *Growing potatoes* 1. *Soil preparation:* Plough/ rotavate or soil cultivator named/ harrow/ remove stones/ create beds/ create drills or ridges ***Any two*** 2. *Fertiliser use:* Soil test **or** FYM **or** 10-10-20 (or 7-6-17) **or** 7-6-17 produces more floury potato **or** broadcast fertiliser **or** fertiliser applied beside seed using potato planter **or** amount fertiliser depends on soil test results **or** avoid over-application of N 3. *Weed control:* Spraying **or** herbicide **or** mechanical (or explained e.g. hoeing) **or** remove by hand **or** burning **or** shading action **or** rotation **or** earthing-up **or** use of plastic 4. *Blight control*: Spraying **or** fungicide **or** certified seed **or** rotation **or** avoid groundkeepers **or** harvest all tubers **or** isolate potato dumps **or** resistant varieties **or** use dessicant before harvest **or** earthing up **or** remove infected tubers	**2(4)** **2(4)** **4** **4** **4**
(b)	*Why use certified seed potatoes:* True-to-type/ free from viruses/ free from diseases or named disease/ graded to uniform tuber size/ higher yields ***Any three***	**3(4)**
(c)	*Experiment to estimate yield of potato crop:* Measure out area of field (in m^2) **or** calculate area of potato ridge (in m^2)/ harvest potatoes inside plot (or from ridge)/ remove soil from potatoes (or wash and dry potatoes)/ weigh/ calculate mass of potatoes per m^2/ repeat for same size plot/ find average/ calculate yield of potatoes using: (average) mass of potatoes per m^2 X 10,000 ***Any five*** [*Some or all marks may be obtained from labelled diagram(s)*]	**5(4)**

Question 10.

(a)	(i) *Parts of cell during mitosis:* *A:* Chromatid (or chromosome) *B:* Spindle (fibre) (ii) *Stage of mitosis shown:* Metaphase (iii) *Stage before metaphase:* Prophase	 **3** **3** **3** **3**
(b)	(i) *Clone:* A group of genetically identical organisms [*allow* a single organism genetically identical to original organism] (ii) *Crop that may be produced by cloning:* e.g. Potatoes **or** strawberries	 **3** **3**
(c)	*Cross 1:* Genotypes of parents: (RR) × (rr) Gametes: (R) × (r) Genotype of offspring: (Rr) Phenotype of offspring: <u>Round</u>	 **2(3)** **2(3)** **3** **3**
(d)	*Cross 2:* Genotype of parents: (Rr) × (Rr) Gametes: (R) (r) × (R) (r) Genotypes of offspring: (RR) (Rr) (rr) Phenotypes of offspring: <u>Round</u> <u>Wrinkled</u>	 **2(3)** **4(2)** **3(2)** **2(2)**

Question 11.

<table>
<tr><td>(a)</td><td>Spring barley v. Winter barley

<table><tr><td></td><td>Spring barley</td><td>Winter barley</td></tr><tr><td>Month of sowing</td><td>Feb. – May</td><td>Sept. – Nov.</td></tr><tr><td>Month of harvest</td><td>Aug. – Oct.</td><td>July – Aug.</td></tr><tr><td>Yield (tonnes/ ha.)</td><td>5 – 7</td><td>6 – 9</td></tr></table></td><td>2(4)
+
4(2)</td></tr>
<tr><td>(b)</td><td>Differences between cultivation and harvesting of feeding and malting barley:
More care (or avoid damage to grain) at harvesting for malting barley/ less nitrogen in fertiliser for malting barley/ different varieties/ winter barley not suitable for malting/ malting barley requires well drained soil (or more suited to sandy loam soils) (or different soil types) Any two</td><td>2(2)</td></tr>
<tr><td>(c)</td><td>Features that show barley is ready for harvest:
Grain (or seed) becomes hard/ moisture content drops to 16 – 18% (or grain becomes dry)/ ear (or seed-head) and-or straw turns a golden (or yellow or bleached) colour/ seed-head bends over (and lies parallel to stem)/ flag leaf withers/ grain starts to fall off stem Any two</td><td>2(2)</td></tr>
<tr><td>(d)</td><td>(i) Click beetle larva: Wireworm
(ii) Crane fly larva: Leatherjacket
(iii) Cereal disease and prevention:
Disease: Leaf smut or rust or (powdery) mildew or Rhyncosporium or barley yellow dwarf virus or leaf blotch (or Septoria) or leaf stripe or Fusarium or take-all or eyespot
Prevention: Spraying or fungicide or crop rotation or certified seeds or resistant varieties or aphid control</td><td>4
4

4

4</td></tr>
<tr><td>(e)</td><td>Experiment to find % germination of barley seeds:
100 seeds (or count seeds)/ soak seeds (for 24 hours)/ seed tray (or suitable container)/ cotton wool (or suitable growing medium)/ warm place or regular watering/ leave for suitable time/ count number of sprouted seeds/ calculate % germination using:
<u>number of seeds germinated</u> X <u>100</u> / repeat/ average Any five
original number seeds 1
[Some or all marks may be obtained from labelled diagram(s)]</td><td>5(4)</td></tr>
</table>

Question 12.

<table>
<tr>
<td>(a)</td>
<td>(i) Paddock grazing system
Drawing to show:
Means of access to paddocks (e.g. roadway or pathway) and at least 10 paddocks
Labels:
(Permanent) roadway/ water (supply)/ fencing/ gates/ paddocks showing re-growth or recovery/ indication of direction of movement of livestock/ number of paddocks labelled (e.g. 20 -25 paddocks) Any three
(ii) Advantage of paddock grazing system:
Fresh grass each day or controlled grazing or 21-day rotation or time for grass to recover or reduced incidence of parasitic worms or paddocks can be fertilised when animals move or more efficient use of grass (or less wastage or less trampling of grass) or less time spent walking or (highly) palatable grass always available or grass more digestible or maximum production from animals or some paddocks can be closed off for silage (or hay) or low labour input
(iii) Disadvantage of paddock grazing system:
Expensive to set up or each paddock must have a permanent water supply or fencing for each paddock or can be difficult to cut silage (or hay) if paddocks are small or poaching damage is possible (in certain weather conditions)</td>
<td>6, 3, 0

3(2)

3

3</td>
</tr>
<tr>
<td>(b)</td>
<td>Making good quality hay

<table>
<tr><th>Step taken</th><th>Reason</th></tr>
<tr><td>Use good quality grass variety (or named grass variety e.g. PRG)</td><td>Hay of better quality or more digestible or higher yield</td></tr>
<tr><td>Cut grass at correct growth stage</td><td>Hay of better quality or more digestible or easier to dry</td></tr>
<tr><td>Control weeds</td><td>Hay of better quality or prevents poisoning (of livestock)</td></tr>
<tr><td>Cut or mow grass in dry weather</td><td>Easier drying (or allows grass to dry) or lowers risk of weather damage</td></tr>
<tr><td>Allow grass to wilt or dry</td><td>Lowers moisture content</td></tr>
<tr><td>Ted (or turn or shake) grass</td><td>Faster drying or lets air through grass</td></tr>
<tr><td>Rake (or gather) into rows</td><td>Easier to bale</td></tr>
<tr><td>Bale hay</td><td>Easier to handle or to transport or to store</td></tr>
<tr><td>Store hay in (leak-proof) shed or under cover</td><td>Keeps hay dry or prevents rotting</td></tr>
</table>
</td>
<td>3(3) Steps + 3(3) Reasons</td>
</tr>
</table>

Question 12, continued.

(c)	*Good quality silage:* Use good quality grass variety or named grass (e.g. PRG)/ close off field 6 – 8 weeks before cutting (or close off early)/ apply fertiliser/ control weeds/ cut at leafy stage/ cut grass in sunny weather (or cut at midday)/allow grass to wilt/ avoid contamination/ fill pit quickly/ roll grass (or exclude air from grass in pit)/ use additive if necessary/ cover pit with black plastic (or bale silage)/ seal tightly (or weigh down plastic)/ tighten plastic again after 2 – 3 weeks ***Any three***	**3(3)**

(d)	*Tests to determine silage quality, and their purpose:* ***Any three***	**3(3) Tests + 3(2) Purposes**

Test	*Purpose*
Leaf-to-stem ratio	Too much stem indicates poor quality (or more leaf indicates high quality)
Squeeze silage (or dry matter or DM test)	A large amount of water produced indicates low quality (or little water produced indicates high quality)
pH of silage	pH > 5 indicates poor quality (or pH < 5 indicates high quality)
Colour of silage	Dark green (or brown) colour indicates poor quality (or yellow-green colour indicates high quality)
Smell of silage	Putrid smell indicates poor quality (or sharp (acidic) smell indicates high quality)
Taste of silage	No sharp (or acidic taste) indicates poor quality (or sharp acidic taste indicates high quality)
Feel of silage	A slimy feel indicates poor quality (or a soft but firm texture indicates good quality)

Question 13. Any two from (a), (b), (c), (d)

(a)

(i) *Lowland sheep breeds:*

Suffolk/ Texel/ Galway/ Hampshire Down/ Border Leicester/ Charollais/ Beltex/ Blueface Leicester/ Belclare Improver/ Oxford Down ***Any two*** **2(3)**

(ii) *Terms used in sheep production:*

Term	*Explanation*	*Reason for procedure*	
1. *Flushing*	Moving ewes from a low plane of nutrition to a high plane of nutrition (or to better grazing) before mating	Increases fertility **or** increases number of eggs released (from ovary) **or** more twins **or** more regular heat periods **or** safer implantation **or** fewer returns to service **or** higher conception rates **or** increase in BCS	**2(2)**
2. *Scanning*	Using ultrasound (or scanner) to find if ewe is in lamb	To determine if ewe is pregnant **or** to determine how many lambs the ewe is carrying **or** to determine how much meal to feed pregnant ewe **or** to see if ewe is barren	**2(2)**
3. *Steaming up*	Practice of feeding (increasing amounts of) concentrates in late pregnancy	To prevent twin-lamb disease **or** to get stronger lamb(s) **or** reduces mortality **or** to increase milk production in ewe **or** to help ewe produce high-quality colostrum	**2(2)**
4. *Vaccination*	Injection used to prevent diseases (or named disease) **or** to stimulate antibody production **or** for immunity	To reduce mortality **or** (if none of the following has already earned marks for explanation) to prevent diseases (or named disease) **or** to boost antibody production **or** for immunity	**2(2)**
5. *Creep feeding*	Using a creep feeder to allow lambs, but not ewes, access to concentrates **or** use of creep gates to allow lambs, but not ewes, access to grazing	Improved growth rates in lambs **or** earlier weaning of lambs **or** lambs have choice of best grass **or** better parasite control	**2(2)**
6. *Shearing*	Clipping off wool (or removal of wool)	To prevent animal over-heating **or** to prevent flystrike **or** to sell the wool **or** prevents sheep “going on their back”	**2(2)**

(b)	(i) *Gas produced in photosynthesis:* Oxygen (or O_2)[*allow* O]	**3**
	(ii) *Factors necessary for photosynthesis:* Carbon dioxide (or CO_2)/ water/ chlorophyll/ light ***Any two***	**2(3)**
	(iii) *How photosynthesis helps reduce climate change:* CO_2 is absorbed during photosynthesis	**3**
	(iv) *Testing a leaf for starch:* Boil leaf (for 1 minute)/ place in hot alcohol (for 10 minutes)/ removes chlorophyll (or green colour)/ rinse leaf in water/ place on white tile/ cover leaf with iodine/ blue-black (or black) indicates presence of starch ***Any six*** [*Some or all marks may be obtained from labelled diagram(s)*]	**6(3)**
(c)	*Management of dairy calves* (i) *Care at birth:* Have experienced person at hand/ close supervision/ remove mucus from nasal area (or ensure calf breathing)/ dry calf (or ensure cow licks calf)/ iodine on navel/ clean bedding/ colostrum (or ensure cow suckles calf)/ keep calf warm/ tag calf/ vaccinate ***Any two***	**2(3)**
	(ii) *Housing:* Straw (or dry) bedding/ good ventilation/ draught free/ walls and floor disinfected (or good hygiene)/ feeding area available/ fresh water/ adequate space/ adequate lighting ***Any two***	**2(3)**
	(iii) *Disease prevention:* Isolate cow prior to calving (or cow in calving box)/ house is disinfected (or maintain good hygiene)/ navel is disinfected/ calves are vaccinated/ colostrum/ equipment is disinfected/ disposable gloves if assisting calving process/ call vet if necessary/ correct feeding techniques/ disinfect boots ***Any two***	**2(3)**
	(iv) *Introducing hay into their diet:* Introduce hay in first 7 – 10 days/ hay contains fibre/ scratch factor/ helps rumen to develop/ introduces microbes into rumen/ earlier weaning/ more suitable roughage (than silage)for young calves ***Any two***	**2(3)**
	(v) *Use of milk replacer:* Calves weaned off cow's milk/ milk replacer cheaper than cow's milk/ powder is mixed with either cold or warm water/ fed in buckets or ad lib/ feed at correct temperature/ mix powder thoroughly ***Any two***	**2(3)**

(d)

(i) *Molar tooth labelled diagram*

Diagram to show: Tooth with broad top surface and two roots **4, 2, 0**

Labels: Enamel/ dentine/ pulp (cavity)/ crown/ root/ jaw bone/ cement/ blood vessel/ nerve ***Any three*** **3(2)**

(ii) *Function of incisor:*

To cut (or bite or slice) food **3**

Function of molar:

To chew (or grind or crush) food **3**

(iii) *Two other teeth:*

1. Canines **3**
2. Pre-molars **3**

(iv) *Dental formula*

Pig:

Incisor	Canine	Pre-molar	Molar
3	1	4	3
3	1	4	3

OR

Sheep:

Incisor	Canine	Pre-molar	Molar
0	0	3	3
3	1	3	3

OR

Incisor	Canine	Pre-molar	Molar
0	0	3	3
4	0	3	3

4(2)

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