



# Coimisiún na Scrúduithe Stáit State Examinations Commission

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*Marking Scheme*      *Leaving Certificate Examination, 2005*

*Agricultural Science*      *Ordinary Level*

## Leaving Certificate Agricultural Science Ordinary Level Marking Scheme

Section One (120 marks)

Answer **six** questions

1. (a) Earthworm (worm) 4  
 (b) Annelida 4  
 (c) Male and female 4  
 (d) Mixes soil/adds organic matter/ adds nutrients/ aerates soil/ improves drainage  
any two 2(4)

2. Any **eight** correct answers 6(3) + 2 (1)

	CATTLE	SHEEP	PIG
Length of gestation period (approx)	280 – 288 days 9.3 – 9.6 months	145 – 150 days 5 months	112 – 117 days 3.5 – 4 months
Weight of offspring when born (in approx. kg)	40 - 50	2 - 5	1 – 1.5
Normal age of animal at slaughter (approx)	2 - 3 years	3 – 6 months	5 - 6 months
Weight of animal at slaughter (in approx. kg)	500 – 700 kg	40 – 45 kg	80 – 85 kg

3. 5(4)

Part of the body	Where it is found
Retina	Eye
Rumen	Stomach/alimentary canal/digestive system
Renal artery	Kidney
Rings of cartilage	Trachea/windpipe/bronchus/lungs/breathing organ
Rectum	Alimentary canal/intestine/digestive system

4. 5(4)

- (a) (perennial) ryegrass/ (Italian) ryegrass  
 (b) proportion of dry matter kept by animal after digestion  
 (c) 70 – 85%  
 (d) bacteria or named bacteria  
 (e) molasses/acid/ sugars/ inoculants/enzymes

5. 5(4)

- (a) cytoplasm/ nucleus/ membrane/ mitochondrion/ ribosome/etc.  
 (b) cell wall/ chloroplast/ chromoplast/ (large) vacuole/leucoplast  
 (c) nucleus/chromosome/ mitochondrion  
 (d) (cell) membrane  
 (e) iodine/ methylene blue/aniline sulphate/ potassium iodide/etc.

6. 4(5)
- (a) reduces pests/ avoids disease/ improves soil structure/ balanced uptake of minerals/rests land
  - (b) stops sunlight getting at tubers /and causing greening (oxalic acid)/ prevents blight/ improves yield/ controls weeds/ supports stem
  - (c) kills weeds / reduces competition/ eases harvesting/ improves yield
  - (d) better parasite control/ better use of grass/ sheep eat around dung pats/ sheep grazing increases tillering/ higher output from grass/ weed control

7. 5 (2 + 2)

Machine	Label	Used on the farm for
Elevator Digger	<b>A</b>	<b>Harvesting potatoes</b>
Combine Drill	<b>C</b>	<b>Seeds ( and fertilises) / sowing</b>
Plough	<b>B</b>	<b>Turns over top layer of earth/ ploughing</b>
Round Baler	<b>E</b>	<b>Bales hay/ baling</b>
Harrow	<b>D</b>	<b>Prepares seed bed/ harrowing</b>

## Section Two (180 marks)

Answer any **three** questions

8. (a) (i) slow releasing of nutrients/ named nutrient/ easily spread/ cheap/ fertiliser  
any two      **2(6)**
- (ii) nitrogen/ phosphorus/ potassium/ magnesium/ sulphur/ calcium  
or symbols any three      **3(3)**
- (b) (i) CAN/ 10:10:20/ 18:6:12/ urea/ potato manure/ brand name  
any one      **6**
- (ii) growth/ amino acids (protein)/ chlorophyll (green colour)/ photosynthesis/  
nucleic acids/ cell reproduction any one      **6**
- (c) flocculation/ better crumb structure/ better drainage/ raises pH/ increase bacterial activity/  
adds nutrients/ better uptake of nutrients/ improves crop growth/ prevents liver fluke  
infestation/ good for bones any two      **2(6)**
- (d) (i) iron/ manganese/ copper/ boron/ molybdenum/ zinc/ cobalt/ selenium  
any two      **6 + 3**
- (ii) iron- reduced yield in apples or anaemia in pigs  
manganese – “grey-speck” in oats, infertility in cattle  
copper – reduced yield in cereals, “swayback” in sheep  
boron – heart rot in sugar beet  
molybdenum – “whiptail” in cauliflower and broccoli  
zinc – reduced yield in cereals and potatoes  
cobalt – pining in sheep  
one name and matching function      **6**  
[ maximum 3 for unmatched name and function]

9. Answer any two parts (a), (b), (c) or (d).

[2 X 30]

- (a) (i) slurry/ silage effluent/ pesticides/ fungicides/ sheep dips/ herbicides/ litter/ plastic/ drainage water from fields with soluble fertilisers/ manure/ surface run-off from fertilised fields/ run-off from milking parlours/ etc. any three **6 + 2(3)**
- (ii) reduces oxygen levels in streams/ poisons/ enriches water / causes algal blooms/ fish kills any one **6**
- (iii) spread silage effluent on stubble after silage cut/ don't spread effluent near watercourses or bore holes or springs or wells/ site silos away from watercourses or springs or bore holes/ spread diluted effluent at the recommended concentration/ avoid over-use of fertiliser/etc. any one **6**
- (iv) shelter/ habitat for wildlife/ visual amenity/ enclosure any one **6**
- (b) (i) Hereford/Charolais/ Angus/ Simmental/ Limousin/ Blonde d'Aquitaine/ Belgian Blue/ Friesian/ Shorthorn any three **3(3)**
- (ii) body shape/ muscle/ lean meat/ carcass quality any one **3**
- (iii) wide choice of sire/ better conception rate/ less dangerous/ cost any one **6**
- (iv) pneumonia/ blackleg/ viral diarrhoea/ leptospirosis/ mastitis/ brucellosis/ TB/ grass tetany/ scour/ liver fluke/ etc. any one **6**  
ventilated housing/ adequate diet/ vaccination/ antibiotics/ isolation of sick animals/ cleansing equipment/ disinfecting equipment/ avoid contact with neighbouring herds/ avoid contact with wildlife/ dosing/ etc. any one **6**
- (c) (i) left atrium/ right atrium/ left ventricle/ right ventricle/ bicuspid valve/ tricuspid valve/ pacemaker/septum/ or named major blood vessel any four **4(3)**
- (ii) to pump blood (around the body, to the lungs) **6**
- (iii) red blood cell – to carry oxygen (or carbon dioxide as HCO<sub>3</sub>)  
OR  
white blood cell- to engulf bacteria/ to fight disease/ produce antibodies  
OR  
platelets – to clot blood **3 + 3**
- (iv) blood disorder/ paleness/low red blood cell (or haemoglobin or low iron) content any one **3**
- (v) proper diet/ iron injection any one **3**
- (d) (i) silt/ clay/ (fine)sand/ (coarse sand)gravel **4(3)**
- (ii) water/ air/ organic matter/ humus/ minerals any two **2(3)**
- (iii) importance **6**  
air – respiration (of micro-organisms, plant roots)  
water – plant health/ photosynthesis/ turgor in plant/ medium for dissolved minerals/etc.  
organic matter – soil structure/ source of nutrients/ drainage
- (iv) (colloidal) particles come together in clusters/ negative charges on cementing particles/ satisfied by polyvalent cations/ particles linked together by bridges of polarised water/ soil structure (crumbs)  
OR  
description of experiment to demonstrate flocculation of clay  
add clay/ to deionised water/ shake/ test tube with named reagent/ mix suspension with reagent/ note result any two **2(3)**

10. (a) (i) cut stem of water plant/ place in beaker of water/ under funnel/ fill test tube / keep finger on mouth/ invert under water/ add sodium hydrogen carbonate (or pond water)/ (switch on) lamp any three **3(3)**
- (ii) bubbles rising/ photosynthesis any one **3**
- (iii) oxygen (or oxygen and air mixture) **3**
- (iv) rekindles a glowing splint (or appropriate test for gas named in (iii)) **3**
- (v) suitable temperature/light/ carbon dioxide/ water/ chlorophyll (green colour) any two **2(3)**
- (b) (i) A = stem (tuber) B = tap root (tuber) C = bulb (leaves) D = corm (stem) **4(3)**
- (ii) A – potato B – carrot/turnip/swede/beet/etc. C – onion/daffodil/tulip D - gladiolus/crocus/etc. **4(3)**  
[if named examples given in (i) and (ii) marks can be awarded once only]
- (iii) starch/ sugar/ fibre/ vitamin or named vitamin any one **6**
- (iv) reagent **3**  
colour change **3**  
{e.g. add iodine/ observe purple-black colour}
11. (a) (i) vitamins/ minerals/ protein/ fat/ carbohydrate/ oil/ barley/ maize/ oats/ wheat/ corn or cereal/ soya/ beet pulp/ oilseed by-products/ etc. any two **6 + 3**
- (ii) named constituent and matching explanation **3 + 3**
- (iii) matter left when water is removed (by oven-drying to a constant mass) **6**
- (iv) weigh sample/ place in oven/ at 100 °C/ remove/ weigh/ replace in oven/ weigh/ repeat until mass is constant/ calculate dry matter any four **6 + 3(3)**
- (b) flushing (before mating)/ steaming up (before lambing) any one **6**  
more eggs released/ more regular heat periods/ higher conception rate/ better implantation/ healthy lamb/ avoids twin lamb disease/ lower lamb mortality/ lower ewe mortality/ ease of lambing/ helps lactation any two **6 + 3**
- (c) provides antibodies/ protects against disease/ gives nutrients/ laxative/ suitable food while rumen is developing any two **6 + 3**
12. (a) (i) two varieties any two **2(3)**
- (ii) pH/ drainage/ loam/ good structure any two **2(3)**
- (iii) plough/ harrow/ etc. any one **6**
- (iv) approximate date to match crop **3**
- (v) name of pest or disease to match crop control of pest or disease [6 for first correct answer] **6 + 3**
- (vi) approximate date **3**
- (vii) correct method any two points **6 + 6**
- (b) seed tray (container)/ suitable substrate/ count seeds/ sow/ water/ suitable temperature/ leave a number of days/ count number that germinate/ calculate percentage diagram (includes seeds) **3**  
any four points **4(3)**

<b>13.</b>	(a)	(i)	1. <b>B</b>	<b>3</b>
			2. <b>b</b>	<b>3</b>
		(ii)	bb	<b>6</b>
		(iii)	BB	<b>6</b>
		(iv)	Bb	<b>6</b>
		(v)	Black	<b>6</b>
		(vi)	3:1	<b>3</b>
		(vii)	3 (allow 4)	<b>3</b>
	(b)	(i)	size of animal/ weight of animal/ conformation/ ratio of lean to fat/ growth rate/ feed conversion efficiency/ breed/ milk yield <u>any two</u>	<b>2(6)</b>
		(ii)	to find out whether the sperm contains an X or a Y chromosome (allow "male or female")	<b>6</b>
		(iii)	can determine the sex of the offspring/ any valid benefit	<b>6</b>