



Coimisiún na Scrúduithe Stáit
State Examinations Commission

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Scrúduithe Ardteistiméireachta, 2004

Eolaíocht Talmhaíochta

Gnáthleibhéal

Marking Scheme

Leaving Certificate Examination, 2004

Agricultural Science

Ordinary level

**LEAVING CERTIFICATE AGRICULTURAL SCIENCE – ORDINARY LEVEL 2004
MARKING SCHEME**

Section One – Answer any six questions

1. (a) animals that eat plants (grass, herbs) 4
 (b) A = pulp (blood vessels/nerves) B = dentine
 C = enamel/ crown D = gum 4 (2)
 (c) 0033
 3133 4
 (d) grinding/chewing any one 4
2. (a) to prevent entry of flies/ flies carry bacteria (disease,micro-organisms,
 pathogens) any one
 (b) removes particles (dirt)
 (c) check for mastitis (for broken teats/ damaged udder)/ prevents mastitis/
 prevents bacterial growth/ prevents disease any one
 (d) keeps bacterial levels low/cleans machine/ prevents disease
any one
 (e) keeps bacterial levels low/ prevents disease
 5(4)
3. (a) A = crucible/dish B = (Bunsen) burner [allow “chimney” (of burner)]
 (b) to get rid of the water
 (c) minerals/inorganic part/ ashes any one
 (d) remains of (decomposed) plants and/or animals/ organic portion of soil
any one 5 (4)
4. (a) A = antenna (feeler) B = eye/head
 C = wing D = (jointed) leg 4 (2)
 (b) biological control/ silk/ honey/ pollination/ etc. any one 4
 (c) change in body structure (shape)/ change from larva to pupa/ change from
 pupa to adult/ change from nymph to adult/ or example any one 4
 (d) fleas/ lice/ ichneumon fly/ *Scolytis*/ bluebottle/ etc. any one 4
 [allow larval stage if parasitic]
5. (a) Homeguard/Epicure/etc. any one
 (b) suitable temperature (heat or above 5.5 °C)/ well-lit building
any one
 (c) ensure quality/ disease free any one
 (d) eelworm/wireworm(click beetle) /aphid/ Colorado beetle/ blight (fungus)/
 leaf roll virus/ leaf mosaic virus/ etc.
any one 5 (4)

6.

Column A	Column B
water	Dissolves nutrients
clay	Water-retentive particle that helps plasticity
air /water	Provides oxygen for respiration
coarse sand/ gravel	Large particles (. 0.2 mm in diameter) that aid drainage
lime	Helps flocculation

5 (4)

7. (a) Suffolk / Galway/Texel any two **2(2)**
 [if more than two answers given, then a wrong answer cancels a right answer]
- (b) two bodily characteristics (must match named breed) **2(2)**
 Blackface – white wool, horned, black face
 Wicklow Cheviot – white wool, polled
 Galway / Texel – long wool, white wool, polled
 Suffolk – short wool, white wool, polled, black face
 Border Leicester – long wool, white wool, polled
- (c) 5 months (145- 153 days or 21-22 weeks) **4**
- (d) orf/ scabies/ foot rot/ mastitis/ mange/ foot and mouth/ scabby mouth/ fly strike (maggots)/ etc. any one **4**
- (e) symptom (must match named disease) **4**

Section Two – Answer any three questions

8. (a) (i) perennial ryegrass/ Italian ryegrass **6 + 3**
 [allow “ryegrass” as one point]
- (ii) high yield/good quality/ productivity/ palatability/ digestibility/ aggressive growth/ tillering/ longer growing season/persistence
any two **2(3)**
- (iii) DMD is 75%/ digestibility highest/before heading out stage/ half rye grass plants have seed head showing/ leafy stage/ late May-beginning of June (other dates must be justified) any one **6**
- (iv) lactic acid bacteria/ anaerobic bacteria/ *Lactobacillus*/ *Streptococcus*
any one **3**
- (b) (i) close off field/fertiliser added/ grass harvested with harvester/ before heading stage when dry/ mower cuts up grass/ allowed to wilt/ put into silage trailer/ in pit or bale wrapper/ additive added/ lumps shaken up/ grass rolled/ sealed with plastic/ covered with tyres
any five **5(3)**
- (ii) higher DMD/ not dependent on long spell of sunshine/ more palatable/ can get up to three cuts/ can be cut early/ self feeding
any three **6 + 2 + 1**
- (iii) convenient/ enables better grassland management/ easy to move/ cheaper than pit / suitable for small farms/ easily sold (or bought)/ less pollution risk
any three **6 + 2 + 1**
- (iv) lowers pH/ adds sugar (carbohydrate)/ for bacteria (for respiration)/ provides enzymes (inoculant or bacteria)/ adds inhibitors/ adds stimulants/ improves fermentation/ makes silage faster/ increases palatability
any one **3**

9. (a) (i) clover/ appropriate legume/etc. any one 3
(ii) *Rhizobium*/ nitrogen-fixing bacteria any one 3
(iii) fix nitrogen (convert gaseous nitrogen to nitrate)/ makes N available to plant any one 3
(iv) stunted growth/ yellowing of leaves/ reduced crop yield/ low protein/ impaired chlorophyll/ etc. any one 6
(v) CAN/ Urea/ Sulfate of Ammonia/10:10: 20/ correct brand name/ etc. any one 3
- (b) (i) becomes white(milky)/ changes colour 6
(ii) micro-organisms in soil respire/produce carbon dioxide/ production of calcium compound any one 6
(ii) bag with no soil/ sterilised soil any one 6
- (c) (i) magnesium/calcium/phosphorus/sulphur/potassium/ named major element any two 6 + 3
(ii) function of **named** nutrient (function must match name) 3
(iii) boron/ manganese/ copper/ zinc/ molybdenum/ iron any one 3
(iv) raises pH/ helps flocculation/ improves drainage/ improves aeration/ improves earthworm activity/ increases bacterial activity/ crops respond better/ etc. any two 6 + 3
10. Any **two** parts (a), (b), (c). (30, 30)

- (a) (i) (sitka) spruce/ (lodgepole) pine/larch/etc. any two 2(3)
(ii) pH/depth/fertility/drainage/texture any three 3(3)
(iii) fencing/draining/ 2 m apart/ on mound/ add rock phosphate any two 6 + 3
(iv) removing trees (at intervals of time or space) 3
to encourage growth of best trees, etc. 3
- (b) (i) chromosomes 6
(ii) mitosis/meiosis 2(3)
(iii) mitosis – number remains the same/meiosis – number halved or reduced 2(3)
(iv) carcinogen/ UV rays/ sunlight/ X-rays/ radiation/ etc. any one 6
Down's syndrome/PKU/sickle-cell anaemia/ cancer/ etc. any one 6
- (c) named cereal 2
(i) disease-free/high germination rate/high purity type/free of weeds seeds/ any three 2(3) + 1
(ii) diagram 7, 3, 0
labels 2(2)
(iii) target yield per hectare [5 - 10 tonnes] 3
(iv) grain dried/treated with acid/cool shed/well ventilated/pest free any three 2(3) + 1
- (d) (i) Landrace/Large White 2(3)
(ii) name (must match characteristics) 3
Landrace – good conformation/long body/small shoulders/large hams/good back bacon/good pork/ floppy ears OR
Large White – fast growth/very prolific/ good FCR/good meat quality/ upright ears any two 6 + 3
(iii) FCR = the ratio of food eaten to weight gain 6
(iv) diet/health/management/breed/housing/age/sex any two 2(3)

11. (a) (i) A = petal/ corolla B = anther/ stamen/ androecium
C = sepal/ calyx D = carpel/ovary/ gynoecium **4(2)**
- (ii) by insects/ cross-pollination any one **3**
large petals/position of carpel/type of carpel/position of stamen/
nectarines/ coloured petals any one **3**
- (iii) anther/stamen/ male part any one **3**
- (iv) ovary/ female part any one **3**
- (b) (i) not autotrophic(cannot make own food)/feed on organic matter any one **3**
- (ii) spores/ hyphae/ stolon/ asexually any one **3**
- (iii) named disease **3**
blight – examine tubers before planting/use certified seed/listen to
radio warnings/spray with fungicide (or named spray)/
gangrene – use certified seed/avoid damage at harvest/apply
chemicals
clubroot – rotation/etc. any one **6**
- (c) diagram (agar plate) **7, 3, 0**
labels **2(1)**
sterile/agar plate(pour agar and allow cool)/source of bacteria
(soil/water/air/etc.)/ flame loop/ streak(inoculate)/control/ incubate/ upside
down/time/ observe result any five **6 + 3(3) + 1**
12. (a) (i) birth : 30 kg – 50 kg **3**
finishing 550 – 650 kg **3**
- (ii) moderate quality hay (or silage) in diet/ food required for heat
maintenance(colder)/not eating grass/ adequate space/ water/ dry bed
any two **6 + 3**
- (iii) open shed/slatted /well ventilated/ draught free/ disease-free/etc
any two **6 + 3**
- (iv) (growth that occurs when) animal fed well after period of restricted
feeding/ fed on grass in spring after feeding on silage inside in
winter/ making up for lost growth any one **6**
- (b) (i) nerve generally faster/ more immediate/electrical impulse
(hormone slower/ more long term/ carried in blood) any two **6 + 3**
- (ii) oxytocin **3**
- (iii) development of male secondary characteristics/ mature genitalia/
muscular development/ development (maintenance) of accessory sex
organs/ body hair/ deepened voice/ any two **2(3)**
- (iv) sponging: application of hormone (progesterone) impregnated
sponge/ to sheep's vagina/ to interfere with reproductive cycle/ to
synchronise oestrous. any one **3**
scanning: to detect number of lambs **3**
- (v) know the number of lambs/ how much feed for ewe
any one **3**

13. (a) diagram 7, 3, 0
 labels 3(1)
 plant tissue/ blade or microtome/ thin section/ place in water/ select piece/
 place on slide/ add stain/named stain/ cover with cover slip/ place on
 platform/ focus with coarse lens/ focus under higher magnification/ result
any five 6 + 3(3) + 1
- (b) (i) allele – a form of a gene 4
dominant – masks expression of another allele 4
- (ii) gametes (G) (g)
 genotype (Gg)
 phenotype grey 4(2)
- (iii) genotypes (Gg) (gg)
 gametes (G) (g) (g)
 genotypes (Gg) (gg)
 phenotypes grey ebony 9(2)