CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

5038 AGRICULTURE

5038/12 Paper 1, maximum raw mark 90

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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CAMBRIDGE
International Examinations

Mark schemes may use these abbreviations:

- ; separates marking points
- / alternatives
- ® reject
- A accept (for answers correctly cued by the question)
- (I) ignore
- AW alternative wording (where responses vary more than usual)
- AVP additional valid point (where there are a variety of possible additional answers)
- underline actual word given must be used by candidate (grammatical variants accepted)
- D, L, T, Q quality of drawing / labelling / table / writing as indicated by mark scheme
- max indicates the maximum number of marks that can be given
- eq equivalent
- ORA or reverse argument
- IDEA OF where candidates are expected to make an argument which expresses a particular idea, but the was in which they will do this will be many and varied
- ref. explained reference to
- *italics* introductory statements or additional comment on the marking points

Section A

1 **(a)** **A**; *evaporation*
B; *transpiration* [2]

(b) **(i)** soil warmer / more aerated / not waterlogged;
R reference to more nutrients [1]

(ii) at **C** - water-logging /flooding;
at **D** -soil erosion / leaching; [2]
A lack of air for either, but only once

(c) too exposed, high, cold for crops;
fertiliser washed away / run off so lack nutrients; [2]

[Total: 7]

2 **(a)** de-ionised (distilled) water;
barium sulfate; [2]

(b) **(i)** 7; [1]

(ii) dark green; [1]

(c) becomes more acidic / soil holds onto nutrients / releases less nutrients;
due to H ions / nutrients becoming attached to soil complex; [2]
explanation needed for second mark

[Total: 6]

3 **(a)** diffusion; [1]

(b) **(i)** in centre dotted area; [1]

(ii) diffuse;
in the spaces of the cortex;
or
dissolved;
in the water in root cells; [2]

(c) in phloem;
by active transport;
requires energy;
from area of production to area of use / storage; [max 3]

(d) spread out just beneath surface
or
grow very deep; [1]

[Total: 8]

4 **(a)** panga / sickle / axe / saw / mattock / fork / jembe / forked jembe / secateurs / spade;
0 or 1 = 0, any 2 for 1 mark [1]

(b) *appropriate for choice e.g. potato*
planting – e.g. tuber or piece with eye / 5 inch stem cutting;
spacing – e.g. 40cm between rows, 30cm between plants approximately;
fertiliser – e.g. organic compost / FYM;
R poultry manure
timing – e.g. dug into soil; [4]

(c) *e.g. potato*
stem produces stored food in tuber;
connection to parent plant severed; [2]
first mark - appropriate for named crop plant
second mark - relates to separation

[Total: 7]

5 **(a)** **(i)** small intestine; [1]

(ii) stomach; [1]

(iii) emulsify-dissolve lipids / make contents alkaline; *R digests* [1]

(b) *ruminant has – ORA*
shorter small intestine; *A no duodenum*
rumen (first) before rather than stomach; *A 4 chambered stomach*
three extra parts – reticulum, omasum, abomasum; [3]
need to be named for final mark

(c) livestock; [1]

(d) **(i)** **D**; *about eleven times* [1]

(ii) pig diet not grass which ferments in goat/sheep; [1]
A ref to rumen / chewing cud

[Total: 9]

6 **(a)** **B**; **G**; [2]

(b) **J**; *keep healthy and at constant weight* [1]

(c) sneezing / watery nasal discharge;
coughing;
watery eyes; [max 2]

(d) one that has to be reported to vet / ministry; [1]

(e) **(i)** wear protective boots / gloves;
secure firmly / with ropes / tethers / crushes / races; [2]
A ref. to tranquilisers
A separating male / mother

(ii) quietly / no noise;
from the front / be seen; [2]
A no sudden movement

7 **(a)** **C**; *gene* [1]

(b) **(i)** short feature dominant; ORA [1]

(ii) long allele effect hidden in offspring / AW;
A recessive allele
look for marks on diagram if given
long allele passed unchanged to F2;
idea of two alleles; [3]

(iii) select long haired rabbits from F2;
breed over (many) generations; [2]

(c) **(i)** rabbits suckle milk from mother; [1]

(ii) generally increases / odd dip week 6; [1]

(iii) 8;; [2]
A 1 mark if method correct but calculation wrong

[Total: 11]

8 (a) (i) **B**; *insulation* [1]

(ii) **E**; *let air in* [1]

(iii) bricks are stronger / harder / tougher;
durable / not a fire risk / do not rot; [1]
A easier to clean

(b) (i) pump from dam;
to high water tower / tank; [2]

(ii) *reference to either cistern in roof or in trough*
use a floating ball;
to open and close valve / described; [2]

[Total: 8]

9 (a) **A**; *the price will drop* [1]

(b) (i) increase dairy cattle; [1]

(ii) beans do not need much fertiliser as they are a legume / have nitrogen fixing bacteria in root nodules; [1]

(iii) *no* - since feed costs are to rise and they already are a third of the egg sales / not profitable; [1]
need to make link between cost and sale

[Total: 4]

Section B

10 (a) the same crop grown on a piece of land;
for a period of years / several seasons; [2]

(b) artificial alteration of genetic material in a way that does not occur naturally;
A by selective mating / artificial selection;
by genetic engineering;
DNA / sections of genetic material transferred;
between individuals of (same or) different species;
use of microorganisms; [max 3]
specific examples / details;; [max 2]
[max 5]

(c) for – lower input costs;
premium market prices;
market opportunities may be larger;
wildlife benefits / supports biodiversity; *A environment benefits*
no pollution;
against – lower yields;
higher labour costs/more labour intensive;
A market opportunities may be restricted
time taken to achieve organic status; [max 8]

[Total: 15]

11 (a) definition - hard layer;
below surface of soil;
rich in iron oxides;
caused by cultivation to constant depth;
occurs naturally in some soils;
A restricts root growth/drainage; [max 4]

(b) causes break down rock or makes it more vulnerable to other forms of weathering to form soil;
exposed rock may be oxidised;
CO_2 mixes with rainfall;
(carbonic) acid forms in rain; *Allow ref. to other relevant acids*
dissolves minerals in rocks;
detail ref. re hydration / hydrolysis / high temperatures affecting rate of chemical reactions;
[max 5]

(c) small particles;
below 0.002mm;
small air spaces / poor aeration;
poor drainage;
high in nutrients;
heavy to plough / hard to work / sticky when wet / AW;
hard / difficult to break when dry;
slow to warm / cool; [max 6]

[Total 15]

12 (a) named correct pest; *e.g. locust*
life cycle appropriate to named pest
e.g. egg → nymph → adult;; [2]
egg detail;
e.g. incomplete metamorphosis;
ref. to moulting; [max 4]

effect: stage causing damage;
part of plant attacked;
damage caused: e.g.
loss of photosynthetic tissue;
wounds provide entry for pathogens; [max 3]

spread: depends on pest selected – could be
flight;
already infected material;
lack of field hygiene;
poor cultural practice; [max 2]
[max 8]

(b) control using organism / insect / bacteria / virus / parasite / AW;
which feeds on / destroys pest / AW;
example; [max 3]

(c) non-toxic;
does not harm crop plant;
safe harvest interval not needed;
no pollution of environment;
no damage to beneficial organisms;
reduces of input costs;
premium for organic production; [max 4]

[Total: 15]

13 (a) production of milk by female / mammal / mammary glands;
when young feed on milk from mother/mammary glands;
immediately after giving birth; [max 2]

(b) *should be in context of a named animal (but no mark available for naming animal)*
sign(s) animal is ready to give birth e.g.
muscles of uterus begin to contract and relax;
animal isolates itself;
cervix relaxes;
vagina is moist / discharge;
base of tail ridges up;
young animal pushed out of vagina usually head / front feet first;
amniotic sac breaks;
umbilical cord breaks; [max 7]

(c) select best animals;
for specific characteristic(s);
example of suitable character;
select again for suitable animals;
continue over a number of generations;
use of inbreeding;
explanation of line breeding;
use of cross-breeding;
explanation – hybrid vigour;
use of AI;
to gain rapid change / influence in herd; [max 6]

[Total: 15]

14 (a) pasture divided into camps/paddocks;
animals graze first camp then moved; *can get marks from diagram*
specified time given /all grass eaten;
repeated for other camps; [max 3]

(b) *type*
ref. rangeland (natural) / planted;
suitability
ref. mixed herbage / AW;
ref. drought resistance;
ref. palatability;
ref. nutrient value;
ref. resistance to trampling; [max 4]
specific suitable plants/grasses named;;; [max 3]
general description e.g. grass, bushes, legumes max 2 marks
(named plant linked to suitability = 2 marks) [max 7]

(c) may result in soil erosion;
quality of pasture suffers;
less plant diversity;
pasture does not have time to recover;
ref. compaction;
AVP;; (e.g. ref. reduction in rainfall) [max 5]
brief statements without explanation max 2

[Total: 15]