CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2013 series

5038 AGRICULTURE

5038/12 Paper 1 maximum raw mark 100

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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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)** cultivator – create tilth / clear weeds or stones;
seed box – plant / drill seeds;
plough – turn soil over
allow prepare a seed bed
allow break up soil [3]

(b) **(i)** B;
allow to make rusting less likely [1]

(ii) break due to excessive force;
wood worm / termite damage / rot;
allow miss-use
pest damage, no mark needs pest name
reject not drying handle [2]

[Total: 6]

2 **(a)** hammer – driving / hitting nails though wood;
saw – cutting wood;
spanner- tightening nuts
the use of the tool in context needed for mark [3]

(b) **(i)** D
thatched roof insulates / absorbs heat
heated air does not enter building; ORA [2]

(ii) E
metal / blocks resistant to weathering;
any 2 fire;
termites; ORA

reject strong / durable unless qualified

allow has foundations [2]

[Total: 7]

3 **(a)** X – stigma;
Y – ovary; [2]

(b) C;
allow an inherited feature [1]

(c) D;
allow all BB [1]

(d) homozygous similar / same alleles;
heterozygous different alleles;
allow marks by reference to AA and Aa

(e) **(i)** vegetative / asexual reproduction;
allow vegetative propagation [1]

(ii) the plots have different environmental factors that affect growth differently;
allow different soil [1]

[Total: 8]

4 **(a)** water absorption – large intestine;
digestion of fats – small intestine;
allow small intestine [2]

(b) C;
allow fermentation [1]

(c) calcium;
fertility; [2]

(d) **(i)** dry grass / fresh green grass; [1]

(ii) meat meal and sunflower cake;
both needed for mark [1]

(iii) because they provide high energy;
and high protein;
no mark for food choice
allow high energy from sorghum / maize meal [2]

(e) provides bulk which maintains rumen;
allow reference to overcoming boredom [1]

[Total: 10]

5 **(a)** **(i)** 25%; [1]

(ii) by chewing / eating / biting; [1]

(iii) less area for photosynthesis;
cut surface causes water loss;
allow cut surface allows disease to enter; [2]

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

(ii) A; [1]

(iii) there had been a re-infestation after treatment;
allow ref. to pesticide killing predator

(c) (i) N; [1]

(ii) spraying result less effective or waste of money / spray goes to water courses / non target plants / beneficial species / operator / food; any 2 [2]
allow 4.0g

[Total: 10]

6 (a) (i) to ensure a random sample /mix; [1]

(ii) stream water with dissolved chemicals has a ph / distilled water is neutral; [1]

(iii) red;
allow parts of pasture has different pH [1]

(b) decreases acidity which grass prefer;
higher pH favours micro-organisms;
improves soil structure;
aids ion exchange; any 2
reject makes pasture more fertile unless qualified.
allow – farming activity reduced bushes at first but then had no more effect [2]

(c) (i) 1996 – 1997 bushes reduced in all cases;
or
1997 – 2001 farming activity reduced bush density (which increased in control area)
or
2001 -2006 in all situations bushes have remained constant at their different levels;
reject answers that refer to control, burning and goats as one [1]

(ii) seeds stimulated grow back after fire / fire a one off event each year;
goat grazing continuous / seed heads eaten; [2]

[Total: 8]

7 (a) D;
allow water and a warm temperature [1]

(b) (i) label on shoot above ground;

(ii) food storage; [2]

(c) 1 cm – disturbance by birds eating / water erosion / too hot;
18 cm – lack of oxygen / not enough food in seed to get plumule above ground;
reject too deep unless qualified – e.g. too deep so it cannot grow to the surface [2]

(d) broad bean – food reserve protected below ground;**or**
French bean – 'leaf' unprotected / gets eaten above ground;

[Total:

8 **(a)** C;
allow brick corrugated iron concrete [1]

(b) D;
allow spraying [1]

(c) lethargic / dull eye / watery eyes / dull feathers or coat / unusual stools qualified / isolated / weight loss / nasal discharge / high temperature or sweating / not feeding / droopy stance / irregular breathing; any 3
sign must relate to animal chosen [3]

(d) **(i)** one which must be reported to the ministry;

(ii) Foot and Mouth / Newcastle disease / Rabies; AVP [1]

[Total: 7]

9 **(a)** C;
allow monoculture [1]

(b) **(i)** D;
allow 3:1:1 [1]

(ii) precise amounts added / known;
quicker uptake;
allow to easier to handle / spread [2]

no smell;
higher N P K; any 2 [1]

(c) **(i)** the farmer – saves space / no mucking out;
allow provides double enterprise

the poultry – security / ventilation;

the fish – food source promoted via algae /
droppings / nitrate;
allow run provides shelter [3]

(ii) droppings breakdown cause stagnant / eutrophic conditions no oxygen for fish;
wood rots in water / damaged by flood;
allow droppings pollute water
allow reference to disease [1]

[Total: 8]

10 (a) name of crop

no mark for name

harvesting – manual / mechanical;
tools / implements;
other detail; eg sign of ripeness

storage requirements – e.g. dry;
cool;
insect free;
well ventilated

no mark for name
allow correct ref. to fruit and vegetable crops [4]

(b) (i) appropriate insect pest; [1]
allow smaller crop

(ii) part(s) of plant affected;
signs of damage;; eg spots / wilting
how caused; e.g. feeding method of insect [3]

(iii) as appropriate for insect named:
early planting; crop out of phase with pest;
crop rotation; different crop grown; breaks cycle;
weed control; weeds harbour pests;
field hygiene; burning of trash / residues;
ploughing; – to expose eggs/larvae;
use of insecticide; named example / type; details of application – timing; method;
biological control; definition -prey predator;
example;
manual control; picking off insect or leaf by hand; [7]

11 (a) **stock**; numbers of; different types / classes; identification; dam/sire; dob; birth weight; yields;
health; vaccinations; other treatments; **breeding records**; mating; offspring; pedigree;
feed inputs; food conversion ratio;
costs; outgoings; income; profit;
field management; rotations; seeding; [7]

(b) each factor should be described and then qualified with a reason:-

area;; e.g. amount available / needed /
nearness to homestead;
climate;;
set-up costs;; e.g. fencing / buildings
availability of feed; water;
labour requirements;;
markets – is there a need;
proximity;
processing requirements;; [8]

12 (a) movement of nitrogen through environment;
air is 80% nitrogen;
nitrogen-fixation; by bacteria in soil; lightning;leguminous plants;
nitrogen from decay of organic material /dung /urine;
produces ammonium compounds;
by nitrifying bacteria;
production of nitrites then nitrates;
nitrates absorption by plants;
nitrogen used for protein production;
animals consume plant material;
action of denitrifying bacteria; [8]

marks from text or diagram

(b) (i) (system of cultivation) where two or more crops are grown on a piece of land in a fixed sequence (over three consecutive growing seasons); [1]

(ii) suitable choice of crops; [3]
correct sequence;
fallow period / legume;

allow marks from text or diagram:-
e.g. root crop – cereal / fruit – legume – leafy crop

(iii) breaks life-cycle of pests;
discourages build-up of soil borne disease; uses soil nutrients efficiently /
avoids rapid depletion of soil nutrients/maintains soil fertility / less N fertiliser used;
legumes improve nitrogen status of soil;
reject helps control pests/diseases without explanation
allow maintains soil structure
allow sustains yield [3]

13 (a) transports water;
and mineral salts;
from roots to other parts of plant; [3]

(b) (i) transpiration is loss of water from leaves;
water from soil enters root via root hairs;
by osmosis;
passes to leaves / travels through xylem;
transpiration pull / root pressure;
into mesophyll / air spaces in leaves;
water lost as vapour;
diffuses into atmosphere;
via stomata;
ref. to water potential gradient;
rate of transpiration affected by temperature /
humidity / wind speed;; any 2 [9]

(ii) maintains flow of water through plant;
moves dissolved minerals;
maintains turgidity of cells /support;
cooling;
allow ref to photosynthesis [3]

14 (a) descriptions of:
topsoil removed by rain;;
flooding;;
sheet erosion;;
run-off;;
gully erosion;;
by wind;;

effect of fire;;
drought;;
over-grazing;;
monoculture;;
cultivation practices; e.g. over watering
deforestation; not planting;
ploughing up slope; [8]

plus detail to max 2

(b) for each method given, marks for – name; description; explanation;

contour ploughing;;;
contour ridging/grass bunds/grass strips;;;
terracing;;;
windbreaks;;;
maintaining vegetative cover;;;
controlled grazing;;;
mulching;;;
max 3 for each
allow max 4 for naming without any explanation [7]

[Total: 100]