**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# MARK SCHEME for the October/November 2012 series

## 0600 AGRICULTURE

**0600/11** 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.

Cambridge will not enter into discussions about these mark schemes.

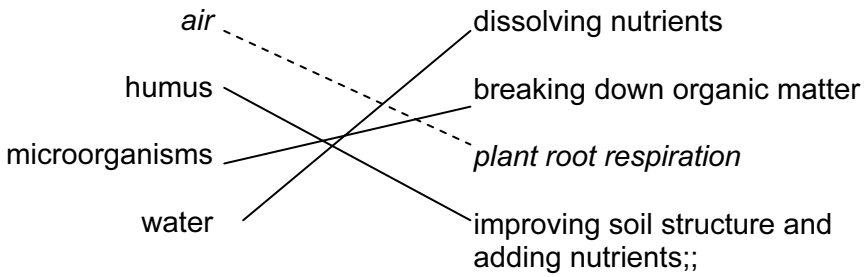
Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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 valid answers)
- underline actual word given must be used by candidate (grammatical variants excepted)
- 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 ways 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

**1** **(a)** **A** – humus, **B** – silt, **C** – sand, **D** – gravel
*all four correct = 3, three correct = 2 , 1 or 2 correct =1* [3]

**(b)**




*all correct = 2, one or two correct =1 mark* [2]

**(c)** increases availability of (some) minerals; [1]
*A reference to promoting soil microorganisms (bacteria)*

**[Total: 6]**

**2** **(a)** **C**, **A**, **B**; *in that order* [1]

**(b)** *named crop e.g. maize*
appropriate fertiliser; *e.g. FYM*
appropriate timing; *e.g. in seedbed, shortly after sowing*
correct signs; *e.g. 'milk stage', drying/browning of silks* [3]

**(c)** pollen from anther to stigma;
agent e.g. wind;
fertilisation detail e.g. pollen tube / fusion of gametes or nuclei / development of seed / fruit; [3]

**[Total: 7]**

**3** **(a)** **D** between ammonium compounds and nitrogen in air;
**P** between dead organic matter and ammonium compounds;
**N** between ammonium compounds and nitrates; [3]

**(b)** **(i)** root crops, legumes, cereals; *in that order* [1]

**(ii)** nitrogen fixing bacteria in root nodules;
can improve nitrogen levels in soil; [2]

**(iii)** reduces pest / disease build up in soil / reduces need for pesticides / better utilisation of minerals / AVP; [1]

**[Total: 7]**

**4** **(a)** osmosis; [1]

**(b)** **(i)** correct label; *tall cells with chloroplasts near top of section*
correct label; *cells in the lower part of the vascular bundle* [2]

**(ii)** guard cell; [1]
*R stoma*

**(c)** loss of water vapour / evaporation (mostly) through stomata;
concentration gradient across leaf air spaces / mesophyll;
draws water up through xylem;
affected by temperature / humidity / air movement; [max 3]

**(d)** thick cuticle / reduced surface area / narrow leaves / surface hairs / AVP; [1]
*R wilting*

**[Total: 8]**

**5** **(a)** **A**; *covering all stores of food* [1]

**(b)** **B**; *contagious* [1]

**(c)** **(i)** fever / temperature;
loss of appetite;
abnormal behaviour;
skin lesions;
discharge from eyes / nose / mouth; abnormal urine / faeces;
AVP; [max 2]

**(ii)** isolate animal;
seek veterinary advice; [2]
*R vaccination*

**(d)** **(i)** chicks need warmth;
lamp provides warmth in place of hen; [2]

**(ii)** provides immunity/protects from disease;
before immune system is fully developed; [2]
*A reference to named disease for second mark*

**[Total: 10]**

**6** **(a)** **(i)** rumen; [1]

**(ii)** digest cellulose; [1]

**(iii)** abomasum; [1]

**(b) (i)** *both have:*
oesophagus;
small intestine;
caecum;
colon;
rectum; [max 2]

**(ii)** simple / single chamber stomach in non-ruminant / 4 parts in ruminant stomach / longer small intestine in non-ruminant; [1]
*answer must make clear to which system it refers*

**(c)** deforestation; [1]

**(d) (i)** **C***; about nine times more* [1]

**(ii)** bacterial action in rumen produces methane / AW; [1]

**[Total: 9]**

**7 (a)** **A**; *increase in population* [1]

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

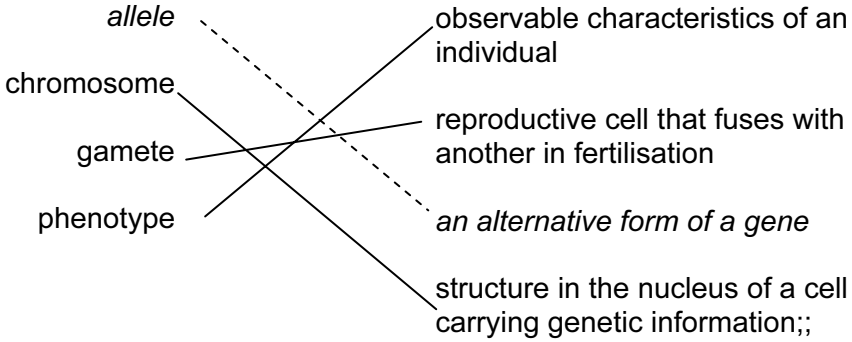
**(ii)** *arable because*
no increase in costs but likely increase in sales receipts / gross margin / profits;
*A if plausible case made for other enterprise* [1]

**(iii)** *poultry / egg production because*
profit is very small so feed costs may neutralise increased price for eggs / AW; [1]

**(iv)** labour / water / other utility / transport / machinery; [1]

**[Total: 5]**

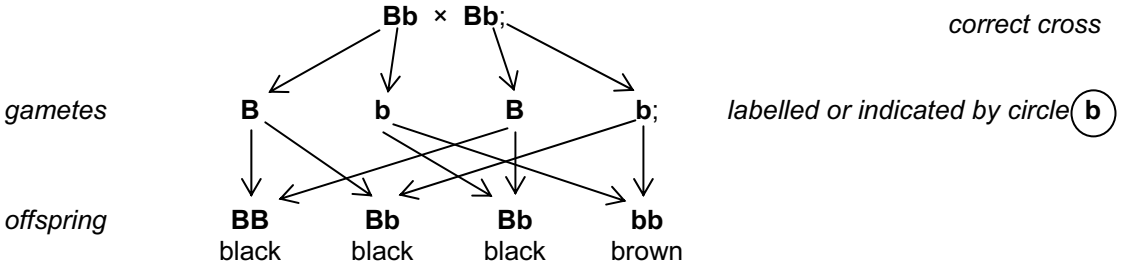
**8 (a)**




*all correct = 2, one or two correct = 1 mark* [2]

**(b) (i)** all contain black allele which is dominant; [1]

**(ii)** correct cross with suitable alleles, e.g.




*A correct Punnet squares*
correct links *and value brown rabbits* 25*%*; [3]

**(c)** **(i)** 8;; [2]
*A 1 mark for correct method if answer wrong*

**(ii)** rabbits are being suckled / feeding on milk from mother; [1]

**(d)** body mass increase steady but food intake blip at week 5 or 6;
change in body mass larger than amount of food intake ;
use of figures to illustrate; [2]
*ignore both increase*

**[Total: 11]**

**9** **(a)** **(i)** **A**; *control of pests* [1]

**(ii)** **C**; *improved ventilation* [1]

**(iii)** stronger / will withstand, larger / heavier, animals; [1]

**(iv)** easier to clean / AVP; [1]

**(b)** direction of prevailing wind; orientation to sun; distance from farm house; nearness to water supply; ground conditions; accessibility to road / pasture; AVP; [max 3]

**[Total: 7]**

## Section B

**10 (a)** hard crust;
on soil surface;
caused by heavy rain / compression by heavy machinery; [max 3]

**(b)** wind carries particles;
which abrade rocks;
temperature changes / heating and cooling;
cause expansion and contraction;
results in cracking/breakdown of rock;
water freezing in rock/cracks;
expansion causes breakdown;
moving water carries particles;
which wear away rocks;
carries particles to other areas (forming soil there); [max 6]

**(c)** large particles;
above 0.05mm; *A 2.0 – 0.02*
large air-spaces / well aerated;
good drainage / poor water holding;
easily leached / eroded;
lacks nutrients / low in organic matter / inert;
light / easy to work;
quick to warm / cool; [max 6]

**[Total: 15]**

**11 (a)** arable and livestock farming;
on one/the same farm; [2]

**(b)** use of natural fertilisers / plant and animal manures; ORA not artificial fertilisers
no use of growth promoters / hormone sprays;
*R chemicals unqualified*
use of crop rotation / rotation of livestock and crops;
to maintain soil fertility;
to control pests / diseases;
pest control using / biological control; ORA not pesticides
cultural methods;
ref. to standards laid down by national / international organisations;
requirement to preserve soil quality / structure; [max 5]

**(c)** against *cost qualified e.g.* seed / plant sterile / can't save seed / availability;
*environmental concern e.g.* pollen crosses with wild plants / affects biodiversity / more herbicide used on weeds as plants resistant / no control / affects other farmers crops; [max 2]

market resistance to produce;
ethical considerations;
disease organisms / pests evolve greater effectiveness ;
unknown effects / allergies on consumption; [max 2]

for *solve world food problem, qualified e.g.*
higher yield;
alter to grow in wider climate;
resistance prevents waste; [max 2]

*improve market quality e.g.*
taste;
shelf life;
improved nutritional value;
*environmental advantage e.g.*
less pollution potential
cost of inputs reduced - less need for chemical control [max 2]

[max 8]

**[Total: 15]**

**12 (a)** animals housed / kept in feedlots;
forage cut / harvested / example;
carted / fed to livestock in fresh state; [max 2]

**(b)** removal of bushes / unwanted trees;
fence;
soil preparation – plough; harrow; roll; fertilise; [max 2]
sowing - seed rate; season of establishment (e.g. rainy season);
seed / plant mixture – suitable plants named; [max 2]
inclusion of legumes;
irrigate;
weed control; [max 7]

**(c)** difficult to control animals - harder to control mating;
to check on animals for disease/control parasites;
to ensure all receive correct ration;
may stray into crops; [max 2]
animals more likely to be attacked by predators / stolen;
difficult to maintain pasture quality;
grazing inefficient / under grazed;
no selective grazing;
practice may result in soil erosion;
difficult to conserve forage; [max 6]

**[Total: 15]**

**13 (a)** named correct pest; e.g. *aphid*
*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 sap / AW,
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)** methods / practices when cultivating crops that break the life cycle of pests;
weeding / early planting / clean planting material
/use of resistant varieties / ploughing to expose eggs or larvae /
crop rotation / burning;; (any 2) [max 3]

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

**[Total: 15]**

**14 (a)** remove young animal from mother;
milk / other food provided by farmer; [2]

**(b)** *should be in context of a named animal (but no mark available for naming animal)*
age of female at mating;
heat period detail;
signs of readiness for mating bulling / moist vulva;
mating details – male to female ratio;
mechanics – erection / action of penis / duration;; [max 2]
semen deposited in vagina;
sperm swim to egg;
fertilisation is fusion of egg with one sperm;
occurs in oviduct; [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]**