CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0600 AGRICULTURE

0600/11 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.

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 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) tool **1** sawing wood;
tool **2** hammering nails;
tool **3** inserting / tightening screws; [3]

(b) (i) building **B** – thatch insulates against sun's heat;
air in building not warmed;
ORA
iron conducts heat from sun;
which warms air in building; [2]
reject building better insulated

(ii) building **A** – brick / iron / concrete resist fire;
weathering;
pest damage;
ORA
iron better as thatch weathers;
catches fire; [2]
reject materials stronger / durable unless qualified

[Total: 7]

2 (a) E C F D; [1]

(b) refer and correctly relate to named animal: temperature; dung / urine; behaviour – isolated; demeanour – alert; eyes bright; no discharge from eyes / nostrils; skin / fur / feather condition; body condition; feeding well; [max 3]
accept reference to external / internal parasites

(c) isolate diseased animals;
call vet;
restrict movement of animals on / off farm;
restrict human movement;
introduce hygiene measures, e.g. foot baths / clean house; [max 3]
reject vaccination
reject inform the authorities

[Total: 7]

3 (a) (i) H G K J; [1]

(ii) *scraping mud* – prevents rusting; easier to use next time; prevents disease spread;
coat with oil – excludes water / air at surface; protects surface; [max 3]

(b) store in dry conditions;
treat with preservative / oil;
paint / varnish;
treat with chemical to deter insects / fungi; [max 2]

[Total: 6]

4 (a) (i) **L**; [1]

(ii)

nutrient in food	*product of digestion*	*function in the body*
	maltose / glucose	energy
protein		growth / repair

[4]

(b) (i) good pasture requires less concentrates;
to achieve same milk production; [2]
reject reference to health or other comments which do not relate to table

(ii) use fertiliser;
liming;
plant improved grasses / leguminous plants;
control weeds / bushes; [3]

[Total: 10]

5 (a) (i) label **Q** to anther; [1]

(ii) label **R** to any of the four ovules; [1]

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

(ii) genotype – genetic constitution / genes / alleles present in organism;
reference made to Fig. 5.2, e.g. ***Y*** *and* ***y***; [2]
phenotype – observable characteristics shown by an organism;
reference made to Fig. 5.2, e.g. yellow and white grains; [2]

(c) asexual / vegetative; [1]

[Total: 8]

6 (a) (i) 10; [1]

(ii) 88; [1]

(b) (i) compete for minerals or nutrients; water; light; root space or leaf space; [max 2]

(ii) harbour pests or diseases / interfere with harvesting crop; [1]

(c) (i) **B**; [1]

(ii) **7** – so label refers to contents;
thus dilution levels known / restrictions of use given / prevents misuse;
other containers may be unsuitable; [max 2]
AVP
explanations needed in both

8 – avoid drift to other crops; operator; water courses;
target plant missed so reduced efficiency / wastes money; [max 2]

[Total: 10]

7 (a) (i) **F**; [1]

(ii) oxygen / air; [1]

(b) lettuce seeds small;
do not have sufficient food store / energy to emerge; [2]

(c) (i) formation of hard crust on soil surface; [1]

(ii) to retain water / reduce evaporation / prevent high soil temperature; [1]

[Total: 6]

8 (a) **K**; [1]

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

(ii) advantage – available / cheap / improves soil structure; [1]
disadvantage – bulky or difficult to transport / smell / difficult to spread / nutrient content variable or not known; [1]
accept slow release
accept introduce fungi

(c) (i) manure high in N / nutrients;
encourages algal growth; [2]

(ii) too much algal growth;
decay by bacteria uses up oxygen for fish; [2]
accept one mark for eutrophication

[Total: 8]

9 (a) (i) acid; [1]

(ii) pH might vary in field so samples needed / obtain average sample;
one result not scientifically valid / could be anomalous; [2]

(iii) adding lime; [1]

(b) (i) temperatures never reach 0 °C;
November to March provide high temperatures needed; provide sufficient total rainfall;
use information from table [max 2]

(ii) October / November / December; provides optimum conditions of temperature and rainfall for the <u>four months / period</u> needed to grow sorghum; [2]

[Total: 8]

10 (a) clearing – e.g. slasher / stumping / removal of previous crop;
primary cultivation, e.g. plough / rotivator;
secondary cultivation, e.g. rake / harrow / levelling;
other detail – use of fertiliser / herbicide;
removal / burning of weeds;
reference to fine tilth; [max 4]
*if no crop name given then no mark for disease in **(b)(i)***

(b) (i) appropriate named disease; [1]
reject general names – fungal / viral / bacterial

(ii) part affected – leaves / stems;
symptoms of infection – black spots / white hair;
effects – wilting / death; [3]

(iii) no plant – no mark
spray fungicide; detail;
crop rotation; breaks life of disease / pest;
weed control; may harbour disease;
pest control; pests act as vectors; pests eat / suck juices from crop;
removing old crop; removes any diseased material;
burning; destroys any diseased material;
use clean seed; no infection introduced; [max 7]
max 4 for four methods without explanation
method 1 mark, explanation 1 mark
reject references to pests unless related to them as vectors of the disease

[Total: 15]

11 (a) crop / seed used;
area used / place in rotation;
date of sowing;
germination percentage;
herbicide treatment;
pest treatment;
weather conditions;
irrigation;
date of harvest;
yield;
input costs / financial records;
sales / returns;
profit;
labour costs; [max 7]

(b)

factor	*explanation*
altitude;	wind / temperature;
aspect;	sunlight / temperature / wind;
slope;	drainage;
climate;	temperature range / rainfall
soil type;	pH / drainage, etc. [max 2]
location / area;	labour availability;
	road access;
	water availability; [max 2]
crop	demand / market;
	suitable cultivar available;
	to give enough time to mature; [max 2]
costs	labour;
	seeds;
	named fertilisers;
	fertilisers; [max 2]

[8]

[Total: 15]

12 (a) cycle indicated;
evaporation; from land / body of water;
sun providing heat;
condensation / clouds;
rain / hail / snow;
percolation into soil / drainage;
reference to water table;
run-off;
water into plants; transpiration from;
water into animals; loss by breathing; [max 8]
accept from diagram or text

(b) (i) artificial supply of water [1]

(ii)

source	*method*	*detail*
river;	channels;	slope to ensure flow;
pipe source;	sprinkler;	rotating valve;
pipe source;	trickle;	series of nipples;

[max 3]

(iii)

advantages	*disadvantages*
channels cheap;	channels erode / disintegrate;
	water evaporates;
trickle; targets particular area;	pipe gets in way of cultivation;
sprinkler; good control;	expensive to set up;
	needs high pressure;

[max 3]

AVP
at least 1 advantage and 1 disadvantage
no mark for method

[Total: 15]

13 (a) definition of process;
carbon dioxide in;
water in;
oxygen out;
carbohydrate formed;
chlorophyll; acts as a catalyst;
light / sun; provides energy;
location – palisade layer of leaf;
reference to other pigments; [max 6]
equation only – max 4 marks

(b) (i) translocation;
in phloem;
as sugars / glucose;
in solution;
from source to root;
concentration gradient / mass flow;
flow requires energy;
function of companion cell; [max 3]

(ii) *examples–* *how modified–*
onions; bulb leaves;
potato; stem tuber;
sweet potato; root tuber;
dicotyledons; pith; cortex;
seeds / fruits; cotyledon / ovary; [max 4]

why modified–
allows for dormant phase;
provides food for new plant;
supports growth of seedling;
provides food for dispersing animals; [6]

[Total: 15]

14 (a) rain drops – physical impact; dissolve some materials;
wind – blowing particles that erode;
glaciers / snow – grinding;
flowing water – river flow acts to scour; carry particles which collide with other particles / erode bank;
sea waves; physical impact;
temperature – hot cold; cause defoliation; freeze thaw; ice expands in rocks;
water and CO_2 – form carbonic acid; dissolves rock; [max 8]

(b) *decaying matter*
provides nutrients for growth;
gives soil structure for roots;
e.g. helps aeration; aids drainage; holds water; binding agent;
supports microorganisms which release nutrients for plants; cycle nutrients, e.g. carbon cycle; converts chemicals $NO_2 \rightarrow NO_3$; fixes nitrogen; [max 4]

organisms
e.g. worms and plant roots;
calcium excreted to maintain pH;
urine / faeces excreted;
mix soil layers;
worms burrow / plant roots penetrate;
allows aeration / drainage; [max 3]

[Total: 15]