

**MARK SCHEME for the October/November 2011 question paper
for the guidance of teachers**

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 must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

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|--------|-------------------------------------|----------|
| Page 2 | Mark Scheme: Teachers' version | Syllabus |
| | GCE O LEVEL – October/November 2011 | 5038 |

Section A

- 1 (a) (i) A – oviduct/fallopian tube;
 B – ovary;
 C – uterus/womb; [3]
- (ii) label clearly indicating oviduct; [1]
- (b) (i) production of milk (by mammary glands) following birth of young; [1]
- (ii) fluid/first milk secreted (immediately) following birth; [1]
- (iii) very rich in proteins;
 contains important vitamins;
 contains antibodies;
 important for immunity/disease resistance; [max 3]
- [Total: 9]**
- 2 (a) (i) use of another organism/bacteria/virus/parasite/insect/ predator;
 to destroy/eat pest; [2]
- (ii) pollination/produce honey/OVP; [1]
- (b) (i) wearing respirator/face mask/goggles;
 wearing boots;
 wearing gloves; [max 2]
- (ii) avoid spraying in windy conditions;
 avoid spraying in wet weather;
 leave recommended interval before harvest;
 avoid too much spray/too coarse spray leading to run-off;
 avoid planting close to water courses;
 OVP; [max 2]
- [Total: 7]**
- 3 (a) number of animals/LSU per hectare; [1]
- (b) (i) milk per animal and milk per hectare both drop (rapidly);
 insufficient grass for each animal (to maintain output); [2]
- (ii) as stocking rate increases (to optimum), output per animal fairly constant/slight
 decrease;
 individual animal has maximum output capability;
 output per hectare increases rapidly;
 more animals per hectare increase total output per hectare; [max 3]

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|--------|-------------------------------------|----------|
| Page 3 | Mark Scheme: Teachers' version | Syllabus |
| | GCE O LEVEL – October/November 2011 | 5038 |

(c) soil erosion;
damage to grass;
weed invasion;
OVP; [max 2]
[Total: 8]

4 (a) (i) A – xylem; [3]
B – phloem;
C – root hair;

(ii) transport of water/minerals; [1]

(b) (i) osmosis; [1]

(ii) water moves from weak soln. to concentrated soln./down water potential gradient;
sap inside cell weaker than salt solution in soil;
water moves out of/cannot be taken in by cells; [3]

(c) anchorage;
storage;
uptake of minerals;
have root nodules/house bacteria that fix nitrogen;
contractile roots;
asexual reproduction; [max 2]

[Total: 10]

5 (a) (i) manoeuvrable in/more suitable for small areas;
less likely to overturn on slopes;
less soil compaction;
especially on wet soils; [max 3]

(ii) insufficient power/likely to be damaged; [1]

(b) cool;
dry;
away from sources of fire;
sealed container;
secure store;
OVP; [max 3]

[Total: 7]

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|--------|-------------------------------------|----------|
| Page 4 | Mark Scheme: Teachers' version | Syllabus |
| | GCE O LEVEL – October/November 2011 | 5038 |

- 6 (a) genotype = Yy;
genetic diagram to show Yy x yy;
result;
- (b) (i) genotype = Tt; [1]
plants produced by asexual reproduction/method;
all genetically identical to (single) parent; [2]
- (ii) uniformity of offspring/crop/AW/rapid growth to maturity/viable seed not produced; [1]

[Total: 7]

- 7 (a) fertiliser –
Y/(22:11:11) X/(10:20:10) Z/(13:13:20);;
3 correct = 2 marks, 2 or 1 correct = 1 mark [2]
- reason –
high nitrogen (needed for leafy/vegetative growth);
high phosphate/phosphorus (needed for root development);
high potash/potassium (needed for flower/fruit development); [3]
- (b) protects from rain/sun;
prevents loss of nutrients/leaching; [2]

[Total: 7]

Section B

- 8 (a) (i) (two or more) crops grown in sequence (in one field);
over several seasons;
ref. to fallow season;
example of crops;
and sequence;
these may be diagrammatic [max 3]
- (ii) avoids nutrient depletion;
different crops have different nutrient requirements;
different rooting depths;
use nutrients from different soil levels;
help to avoid soil pan formation;
breaks pest/disease life cycles;
different crops affected by different pests and diseases;
can control some weeds;
fallow season can enable nutrients to be replenished/aids pest/disease control;
inclusion of legume to fix nitrogen; [max 7]

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|--------|-------------------------------------|----------|
| Page 5 | Mark Scheme: Teachers' version | Syllabus |
| | GCE O LEVEL – October/November 2011 | 5038 |

- (b) (i) arable and livestock farming on one farm;
- (ii) insurance against failure of one enterprise;
greater variety of products to sell;
greater self-sufficiency;
cost-effective/reduces inputs;
animal waste used as manure;
crop residue used as animal feed;

[max 4]

[Total: 15]

- 9 (a) orientation of building;
reason;
direction of prevailing wind;
reason;
distance from farmhouse;
accessibility;
reason;
availability of water supply;
reason;
topography of terrain;
firmness of ground;
reason;
OVP;

[max 9]

- (b) walls – suitable materials;
floor – suitable materials;
roof – suitable materials;
reasons for choice – cost;
availability;
durability;
ease of cleaning;
insulation;
doesn't harbour pests;
OVP;

[max 6]

[Total: 15]

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|--------|-------------------------------------|----------|
| Page 6 | Mark Scheme: Teachers' version | Syllabus |
| | GCE O LEVEL – October/November 2011 | 5038 |

- 10 (a) (i) name of crop – no mark but remainder of question can only be marked for general content if name **not** stated
- (ii) timing stated;
related to temperatures;
rainfall patterns;
time needed for maturity;
avoidance of pest attack;
avoidance of weed competition;
- (iii) cultivar chosen for yield;
quality;
known market preference;
suitability for climate;
detail (e.g. height related to winds);
disease/pest resistance;
- 3 marks from both (a)(ii) and (a)(iii) plus one from either section to max 7 [max 7]
- (b) (i) competition;
for water;
minerals;
light/space;
harbour pests/diseases;
hamper harvesting;
contaminate crop; [max 5]
- (ii) ploughing before sowing/planting to bury weeds;
hand-pulling on a small scale;
hoeing/cultivating;
use of herbicides;
named example;
timing/other detail (e.g. selective/non-selective);
use of mulch;
use of intercropping; [max 3]
- [Total: 15]
- 11 (a) action of plants/tree roots;
animals digging/burrowing;
heating/cooling;
expansion/contraction;
action of frost/water freezing;
abrasion by wind-transported material;
abrasion by water-transported material;
effect of acid rain;
oxidation (of minerals); [max 6]

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|--------|-------------------------------------|----------|
| Page 7 | Mark Scheme: Teachers' version | Syllabus |
| | GCE O LEVEL – October/November 2011 | 5038 |

- (b) clay particles are smallest;
- sand particles are largest;
- proportion of different sizes affects soil properties;
- clay soil retains water;
- easily waterlogged;
- root respiration restricted;
- warms/cooling slowly;
- heavy to work/sticky when wet/hard when dry;
- sandy soil drains quickly;
- easily leached;
- warms/cooling quickly;
- easy to work;
- easily eroded;
- loam soil contains mix of particles;
- avoids worst/combines best properties of either extreme;

[max 9]

[Total: 15]

- 12 (a) unthriftiness/loss of weight/reduced production;
- abnormal behaviour;
 - example;
 - poor appetite;
 - abnormal faeces/urine;
 - condition of coat/feathers;
 - condition of eyes;
 - discharge from nose/ears;
 - fever;
 - lameness;
 - other symptom specific to named disease;

[max 6]

- (b) quarantine/isolation;
- to avoid contact of healthy animals with infected ones;
- slaughter/burning infected carcasses;
- to destroy pathogen; (linked to previous point)
- avoid contact with wild animals;
- may be disease carriers;
- vaccination;
- to confer immunity;
- clean water/food (accept *rotational* grazing as means of providing clean fodder);
- balanced diet;
- to prevent deficiency disease;
- dipping/spraying;
- to avoid disease carried by ticks;
- clean housing;
- use of disinfectants;
- ref. to action on specific disease e.g. mastitis;
- OVP (e.g. regular (veterinary) checks);

[max 9]

[Total: 15]