CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

5038 AGRICULTURE

5038/11 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.

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CAMBRIDGE
International Examinations

Mark schemes may use these abbreviations:

;	=	separates marking points
/	=	alternative and acceptable answers for the same marking point
( )	=	words which are not essential to gain credit
__	=	underlined words must be present in answer to score a mark
e.c.f.	=	error carried forward
o.r.a.	=	or reverse argument

1 (a) **D**; [1]

(b) **D**; [1]

(c) drawing of valid structure;
appropriate hanging – wire loop / gate pintle; *(One mark for each.)*
appropriate fixing – wire loop / bolt; [4]

[Total: 6]

2 (a) (i) marsh unlikely to dry up / is wet /
supply of water readily available from river; [1]

(ii) Tilapia (Cichlids) / catfish (mudfish / Clarias) /
Mullet (Mugil) / tonguefish (Hererotis) /
Carp (Cyprinus); [1]

(iii) quick growing; little fat; good conversion rate;
minimum management / minimum (low) inputs;
available all year; converter of waste / sewage;
[2]

(iv) **B** proteins; [1]

(v) water quality decreases due to township; township uses more water; polluted; [1]

(b) (i) one (hectare per goat); [1]

(ii) disease; overgrazing; erosion; compaction; poaching, waterlogging; desertification;
[2]

(iii) cut down / remove trees / fell;
stump / burn / fire harrow / clear / goats or pigs in;
cultivation with detail / plough / disc / dig / seedbed;
improve soil / sow / plant herbage / legumes / example / manure;
herbicides; [3]

[Total: 12]

3 **(a)** **A** top soil;
B sub soil;
C parent rock; [2]

(b) **C**; [1]

(c) paddock 1 any value between 6.5 and 14;
lime is alkaline / basic;

paddock 2 any value between 6.5 and 4;
(decomposers release) H^+ from ammonium compounds;
microorganisms release CO_2 (combines with water to form acid); [4]

[Total: 7]

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

(ii) nitrate; [1]

(iii) legume; [1]

(iv) bacteria; in nodules; fix nitrogen; nitrogen fixation;
nitrogen released to soil on decay; [2]

(b) **D** yellow leaves and stunted growth; [1]

[Total: 6]

5 **(a)** **A**;
no fertiliser added / acts as a comparison (to show effects of fertiliser addition); [2]

(b) yield (one tonne / hectare) lower than control / without fertiliser; [1]

(c) small increase / slight increase of 0.3 / ha;

almost four times more yield than control /
almost three times more than N alone; [2]

(d) **C** ($270); [1]

[Total: 6]

6 **(a)** **D** (transpiration); [1]

(b) photosynthesis; leaf turgor; transport of sugars; cooling; uptake of minerals; [3]

(c) germination – seeds wash away / seeds rot / soil waterlogged so no oxygen / anaerobic;

pollination – pollen unable to blow in wind ; fungal disease prevents flowers forming;

harvesting – delay causes cobs to rot on plant / not ripen; could not physically harvest; [3]

(d) high levels of salts / chlorides left in soil from sea;
which causes germinating plants to experience exosmosis;
loss of water; [2]

[Total: 9]

7 **(a)** gullet / oesophagus; rectum; [2]

(b) intake: ingest / grip / bite food;
lubricate: add saliva lubricate food for swallowing;
chewing: break up / chew food;
detail: start digestion / action of ptyalin / starch to maltose;
form bolus; [3]

(c) rennin / chymase curdles milk / makes protein solid (casein);
pepsin acts on casein in intestine;
Accept curdle / solidify. Accept protein breakdown. [2]

(d) fatty acids directly absorbed into blood from rumen; fast acting; [2]

[Total: 9]

8 **(a)** no need for bull; can widely source sperm;
no damage to the cow;
[2]

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

(c) high in nutrients; proteins; vitamins; electrolytes;
high in antibodies;
confers passive immunity / calf is born with no immunity; [2]

(d) (i) Bb × Bb [1]

(ii)

Bb	×	Bb	
B	b	B	b
BB	Bb	Bb	bb

[3]

[Total: 9]

9 (a) weeds; [1]

(b) appropriate crop and pest;
explanation;
e.g. locust – bites / chews leaves so lack of photosynthesis
weevil – bore in stem plant collapses
aphid – pierces stem takes food/nutrients from plant or transmits disease [2]

(c) competition for root space; leaf competition for light;
weeds harbour disease / pests; [2]

(d) rye has smaller leaves;
grows in drier regions less prone to disease spread;
more resistant / less inbreeding;
not commonly grown so less disease in habitat; [1]

[Total: 6]

10 (a) rotation example (any appropriate);
legume – cereal / brassica – root crop – (fallow); [2]

reasons – legume to provide nitrogen;
high nitrogen nutrient demanding crop follow legumes;
deep-rooted plant follow shallow;
fallow to rebuild soil structure / allow land to recover;
sustaining soil fertility;
using the whole soil profile; [3]

(b) principles of shifting cultivation –
clear, burn, crop until soil infertile, move on;

adv: self sufficient / no expensive inputs, e.g. fertiliser;
long term environmental damage reduced;
e.g. low carbon footprint / soil erosion; burning supplies potash / kills pests;

disadv: production provides for small groups;
trade limited;
requires much land / short term damage; destruction of animal habitats;
desertification; soil erosion; [5]

(c) inappropriate climate – temperature / rainfall unsuitable for plant growth;
substrate rock no soil formation possible;
chemical nature / pH prevents plant growth;
topography – too steep;
altitude – too cold / lack oxygen;

[5]

[Total: 15]

11 (a) suitable cultivar named;

selection for – soil type;
climate;
disease resistance;
productivity / growth rate;
yield

[4]

(b) irrigation; and method;
fertiliser application method; name / type;
weed control method; detail;
pest control method; detail; detail of damage prevention;
cultivation – aerated / hoe / scarify / spring tine / disc / plough;

[5]

(c) harvesting – when; how; detail (brown / gold, ripe, dry, died off)

storage – building described; conditions described;
precautions needed, security / pest control;

uses of product / example; [6]

[Total: 15]

12 (a) involves single organism;
no gametes;
genetically similar / identical offspring;
<u>mitosis</u>;
example;

[3]

(b) underground stems;
grow from base of plant;
produce tubers at end;
starch-filled / food reserves;
each tuber has eyes;
buds grow into new plant;
old plant dies;
many new plants next season;

[6]

(c) pollen from anther;
pollination by insects;
transfer to stigma;
of other plant;
pollen tube grows down style;
reaches ovule;
fusion of gametes (pollen and ovaries);
plant produces pollen tube;
pollen tube grows down style;

[6]

[Total: 15]

13 (a) signs – temperature / lethargy / hair loss / pustules;
abnormal faeces blood / worms;
discharge from eyes / nose / cough / sneeze / nasal discharge;
isolated / appetite loss;
stand head down / drooping / poor stance;

[5]

(b) method of spread – contact / in air / in water / vectors / carriers; detail; [5]

prevention cleanliness; details, e.g. frequency of cleaning / disinfectants;
isolation of stock;
vaccination;
hygiene of handlers;
ventilation;
vector control / control of carriers; [5]

[Total: 15]

14 (a) high temperature increases enzyme activity / metabolism;
increases transpiration so speeds growth;
increases photosynthesis;
ripens crop earlier;

low temperature any o.r.a. above not mentioned;
ice crystals form / ref. structural damage;

[5]

wind effects increases transpiration leads wilting;
physical damage stem breaks / leaves lost;

[2]

(b) furrows / ponds / dams; detail – site, materials;
roof; into water tanks; detail – site, covering;
boreholes; extraction method;
river extraction; detail – pipes, pumps;

[4]

(c) mulching; reduces soil evaporation; suitable material;
minimum tillage; described; effect less soil exposure;
shading / reducing direct sunlight;
plant hedges as windbreaks – reduce evapotranspiration;
improve soil structure – add organic matter / humus;

[4]

[Total: 15]