

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

5038 AGRICULTURE

5038/11

Paper 1, maximum raw mark 100

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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

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- 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]**

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- 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]

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- 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]

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(d) (i) $Bb \times Bb$ [1]

(ii)

Bb	$\times$	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]

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- (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;
mitosis;
 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]

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- (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]

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- (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]