

**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<sup>+</sup> from ammonium compounds;  
microorganisms release CO<sub>2</sub> (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 × 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]

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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]**