

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge Ordinary Level

## **MARK SCHEME for the October/November 2014 series**

### **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.

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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) C (mixed); [1]
- (b) (i) gum/rubber; nuts/fruits; cork; medicines;  
*Credit other uses.* [2]
- (ii) reduce carbon dioxide from air/lower greenhouse effect;  
provide many ecosystems habitats;  
part of the water cycle so no desertification;  
prevent erosion of soil; [2]
- (iii) prevents total biotic change to ecosystem;  
canopy still in place so no erosion/run-off/landslides;  
flash flooding;  
allows time for regeneration/establishment of ground cover;  
new trees planted;  
sustainable forestry; [1]
- [Total: 6]**
- 2 (a) H placed in top half of top soil; [1]
- (b) roots force their way into rocks/force rock apart;  
roots release chemicals/acids/H<sup>+</sup> lead to chemical breakdown; [2]
- (c) 4.5 red 6.0 orange 7.0 green 8.5 blue/purple; [2]  
*All correct for two marks.*  
*Two or three correct for one mark.*
- (d) 7; *Accept 6.5 to 8.*  
pH at which most nutrients are available to plants; [2]
- [Total: 7]**
- 3 (a) Hill farm – sand provides easy access for roots;  
roots easily go down;  
drainage prompts roots to grow down;  
lots of air spaces/good aeration in sandy soil;  
  
*o.r.a. because Valley farm too wet for one mark.* [2]
- (b) bore hole/well;  
roof collection; [2]  
pipe, pump and tank;
- (c) B (place the pipe ends in hot water); [1]

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(d) C (raising the height of the tank); [1]

[Total: 6]

4 (a) B; [1]

(b) (i) Americas;  
Asia;  
Europe;  
**Africa**

*All correct for one mark.* [1]

(ii) Africa needs crops for food;  
lack of capital for technology;  
priority is food not fuel;  
lack of surplus land / food / crops; [2]

(c) (i) giant grass / prickly pear; [1]

(ii) cereals; [1]

(d) (i) 800                      9000  
6200                      9000  
   2800 [4]

*One mark for 9000 correctly placed twice.  
One mark each for the rest.  
Allow e.c.f.*

(ii) labour; machinery; fertiliser; spray; chemicals; pesticides; fuel; wages; transport; [1]

[Total: 11]

5 (a) C (organic matter); [1]

(b) nodules contain bacteria / nitrogen fixing bacteria / *Rhizobium*;  
nitrogen incorporated into cycle;  
nodules / plant decays releasing nitrogen into soil; [2]

(c) plant leaves go yellow / not dark green;  
stunted growth;  
*Accept lack of protein synthesis.* [2]

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- (d) monoculture;  
ploughing down the slope;  
(over)watering / (excessive) irrigation;

*Accept harvesting crops.*

[2]

[Total: 7]

- 6 (a) (i) **B K;**  
**B C; D J;**  
*One mark for each pair.*

*Or BK: CDJ for three marks.*

[3]

- (ii) **D** = omasum;  
**E** = small intestine / ileum;

[2]

- (iii) any letter **A – K;**

[2]

- (b) they break up cellulose (cell walls to release contents)/they digest cellulose;  
they are themselves digested;  
to release / obtain proteins from cellulose;  
protozoa synthesise proteins;

[2]

[Total: 9]

- 7 (a) (i) epididymis;

[1]

- (ii) produce seminal fluid (for sperm to live in);

[1]

- (iii) interlocks with vaginal groove;

[1]

- (b) (i) **B** (19);

[1]

- (ii) spiral / double helix; DNA; series of base pairs or alleles;  
(inert) centromere;

[2]

- (iii) **B** nn;

[1]

- (c) **D** (by using artificial selection);

[1]

[Total: 8]

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- 8 (a) A (they all compete with crops); [1]
- (b) (i) plant at particular time; rotations; fast-growing varieties/competition; intercropping; under-sowing; [1]  
*Accept burning.*
- (ii) hoe/cut/plough in/pull up; [1]
- (c) chemical could/will kill rhizome; other methods can fragment rhizome, each bit re-grows; chemical is systemic and can reach root; [2]
- (d) release pressure; empty tank; clear the nozzle; wash out the drum; allow to dry/store in a dry place; [2]
- [Total: 7]**
- 9 (a) (i) C (to let air in); [1]
- (ii) wood/thatch – good insulator; locally sourced; cheap, if qualified; metal – fire resistant; long lasting; concrete – resistant to fire; weather/cyclone; termites do not eat/pest proof; [2]
- (iii) advantage: protected from predators/less eggs lost/easier to catch/don't roost elsewhere/get lost; disadvantage: ground stale/build up pests/disease/foot and leg injuries/hock burn/grass killed/feather peck/disease; [2]
- (b) (i) hen 1 3 days on 1 day off; hen 2 2 days on 1 day off 3 days on; *Need to identify 'days off' laying.* [2]
- (ii) genetic make-up; diet/age; *Allow different breed/variety.* [2]
- [Total: 9]**

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10 (a) meaning of monoculture;

less types of machinery needed;  
only one type of pest; weed control;  
training / workers require limited skills ; build up expertise;  
high yield of one crop to maximise market;  
more to sell / more income;

[4]

*Meaning mark can be implied.*

(b) climate – temperature      too high water loss;  
   too low enzyme activity;  
   rainfall      too high physical damage;  
        too low desiccation;  
   substrate rock      no soil formation possible;  
        chemical nature / pH;  
   topography      too steep;  
   altitude      too cold / lack oxygen;

waterlogging / standing water / run-off;  
water supply and access;  
soil quality – nutrient availability;

[5]

*Factor and explanation needed for mark.*

(c) larger population needs more food; competes for land / less land for farming; need more from same land; market opportunity; [2]

*Examples may include:*

battery / broiler production; detail;  
zero grazing systems; detail;  
monoculture; detail;

*Max. four marks for examples.*

[4]

**[Total: 15]**

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- 11 (a) digging method / depth / remove weeds / plough raking detail / remove stones;  
cultivation detail – soil tilth / seed bed / ridges / furrows established;  
fertiliser / (pre-emergent) pesticide / manure added appropriately; [4]

A – turn

Credit correct answers in either section (a) or (b)

- (b) sowing method – broadcast / planter / drilling;  
seed box / germinate / propagator;  
depth;  
space apart;  
row spacing;  
watering;
- planting method – cutting / tuber;  
transplant seedlings;  
depth;  
space apart;  
row spacing;  
watering; [5]

- (c) pests example;  
details of chemical control or; biological control.  
*Max. two marks for detail of predator/prey;*  
cultural control – pick off pests / nets / pinch off tops; [3]

- weeds example;  
details of chemical control or;  
mulching plus detail;  
by hand plus detail;  
mechanical control; detail; [3]

**[Total: 15]**

- 12 (a) cooling via transpiration;  
transport of sugars / minerals;  
raw material for photosynthesis;  
support via turgor;  
uptake of minerals / nutrients; [3]

*Accept enables chemical reactions.*

- (b) (i) wide base / narrower at top;  
inner surface stones to prevent wave erosion;  
outer surface grass / stones / gravel to prevent rain erosion of the dam / rain breakers;  
overflow pipe to prevent erosion;  
cut off curtain / foundations – so pressure doesn't push underneath; [4]

- (ii) pipe system; pump; detail;  
ditches; sluices; detail;  
tank / tower; pump; detail; [4]



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- (c) nutrients lost; by run-off/leaching;  
flooding/water logging; so lack of air/oxygen for root respiration;  
excess water; rots seeds/fruits;  
damp conditions; favourable to fungal infection;

*Any to max. two marks per point.*

[4]

**[Total: 15]**

- 13 (a) a disease that must be reported;  
report to specific authority for appropriate country;  
involves a requirement to fulfil health laws of country;  
Explanation why/example;

[3]

- (b) examples of good hygiene – regular cleaning of floors/walls;  
use of disinfectants;  
clean bedding;  
handler cleanliness;  
foot baths;  
extra hygiene detail (*Max. two marks.*)

examples of specific disease e.g. mastitis/iodine for teats;

foot and mouth/clothes change/foot baths;

[6]

- (c) parasites example and cause two marks for each;  
e.g.  
internal e.g. flukes damage liver function;  
roundworms use hosts food so they become unthrifty;  
external e.g. lice/fleas cause irritation and lack of coat quality;  
fly strike/ticks/ringworm;

[6]

**[Total: 15]**

- 14 (a) transfer of pollen/male sex cells;  
from stamen to stigma;  
agents wind or insect;

[3]

- |                          |                          |
|--------------------------|--------------------------|
| (b) <i>insect</i>        | <i>wind</i>              |
| bright/coloured petals;  | small/green flower;      |
| pollen large/sticky;     | lots of pollen/light;    |
| anthers stigma enclosed; | anthers stigma hang out; |
| nectar;                  | feathery stigma;         |
| scent;                   | no scent;                |
| honey guides;            |                          |

*Four marks max. for each of 'insect' or 'wind'.*

[7]

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- (c) stem cutting size 25 – 30 cm (5 inch);  
 plant half in soil;  
 cut 'stem' at angle;  
 30 cm apart;  
 ridges of soil / compost;  
 drainage / free draining / gritty compost;  
 rows 75 – 100 cm apart;  
 plant start of rainy season / irrigate / water;  
 rooting hormone;

*Accept specific detail e.g.*

cut at angle to expose more cambium / roots  
 tuber with eye for stem cutting  
 fertiliser / FYM / (organic) compost  
 onion – bud makes new plant from own bulb.

[5]

[Total: 15]