

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 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) aspect;
altitude/height above sea level;
sun/shade;
temperature/too cold;
depth of soil/rocks;
water run-off;
soil erosion;
acidic soil;
weeds/named invasive species; [2]
- (b) (i) cutting described;
stumping described;
burning;
removal of stones/rocks; [3]
- (ii) contour ploughing;
terracing;
planting wind breaks/trees;
drainage pipes;
channels/bunds
minimum tillage; [2]
- (iii) burning;
ash high in potassium; [2]
- [Total: 9]**
- 2 (a) S anywhere in tube from entrance to base of ear;
C on the downward pointing tube below join of small and large intestine;
M either end of stomach or at end of tube at anus; [3]
- (b) (i) fluke; P in liver;
tape worm; P in small intestine/stomach;
round worms; P in the stomach/intestine; etc. [2]
- (ii) thin/lack of growth (despite being fed) losing weight/loss of appetite/blood/worms/in
faeces/faeces runny/different colour;
not thriving; [1]
- (iii) good hygiene/animal husbandry with example stated, e.g. rotate pig grazing area;
preventative medicine, e.g. wormers; vaccination; [1]
- [Total: 7]**
- 3 (a) D; [1]
- (b) it feels sticky when wet;
it retains nutrients; [2]
- (c) flocculates/breaks up clay structure/raises pH/reduces acidity; [1]

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- (d) (i) 3(.0); [1]
- (ii) (pH) 5.5; [1]
- (iii) crops at pH 6 on a sandy loam soil; [1]
- (iv) crops require more lime applied than grass; [1]
- (e) animal dung deposited; dung is/breaks down to be acidic; OR
removal of compounds by grazing of grass; no replacement on death; [2]

[Total: 10]

- 4 (a) less competition;
gives the remaining plants more space;
so better root growth;
for nutrients / minerals;
for water;
light in soil;
bigger plants or fruit / improved growth rate;
less chance of disease / pest spread;
easier to control pests; [2]
- (b) *lines between:*
fertiliser = causes excessive...
herbicide = kills some plants...
pesticide = builds up in food... [2]
- (c) compost / use dung / kraal manure;
use mechanical method, e.g. hoe / hand picking / mulching;
use cultural methods, e.g. rotation of crops / biological control / removal of crop residue; [3]

[Total: 7]

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- 5 (a) C; [1]
- (b) (i) S; [1]
- (ii) Y; [1]
- (iii) U; V; W; S; or Z; [1]
- (c) (i) caterpillar / leaf cutter / locust / leaf miner / valid example; [1]
- (ii) less leaf for photosynthesis;
excess water loss causing wilting;
site for disease / infection; [2]
- [Total: 7]**
- 6 (a) (i) (tissue) growth / repair;
carbohydrate / fat; [2]
- (ii) iron for blood;
calcium for teeth / bones;
Accept requirement and relevant condition, e.g. calcium for milk fever. [1]
- (b) (i) aid food movement in gut;
reduce / prevent constipation; [1]
- (ii) grinding;
in gizzard / proventriculus / eq.; [2]
- (c) (i) 30; [1]
- (ii) 46; [1]
- (iii) as stocking rate increases gain in body mass decreases;
because less food is eaten by individuals; [2]
- (iv) no relationship / mortality appears random; [1]
- [Total: 11]**

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- 7 (a) B;
D; [2]
- (b) cross F_1 to produce green oval;
select green oval and (back)cross;
as they are double recessive / all offspring have green, oval fruit; [3]
- (c) (i) use genetic engineering / modification;
detail, e.g. insert gene / length of chromosome for toxin into tomato; [2]
- (ii) toxin might get into the food chain;
humans who eat tomatoes have side effects;
may kill beneficial insects; [1]
- [Total: 8]**
- 8 (a) (i) C; [1]
- (ii) rye grass / timothy grass;
Accept any appropriate grass. [1]
- (iii) B; [1]
- (b) (i) animals might fall in;
ditches take up space for grazing;
ditches get eroded / moving water causes soil erosion;
water might contain diseases / cause water-related disease;
cost of maintenance; [2]
- (ii) loose sand would enter holes and block pipe core in A;
larger pipe in sand takes water away more quickly;
loam soil takes longer to drain so needs holes;
smaller pipe is better for loam soil as it takes longer to drain; [1]
- [Total: 6]**
- 9 (a) (i) description of an insert / connector;
description of fixing hose clip / solder; [2]
- (ii) tank; height increases pressure;
storage tank; for use in shortage; more / better pump(s); better pressure / constant supply;
cistern in building;
with tap / ball valve / trough for control of supply;
collect water from roof; free; more water;
purification; for clean water;
bore-hole; to obtain underground water;
bury pipes; to avoid damage;
give each building its own pipe; if one breaks, the other works / security of supply;
bigger pipe; more water; [2]

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(b) B; [1]

[Total: 5]

10 (a) movement of food / products of photosynthesis;
sugars;
in phloem;
from where made to where need;
to make starch / cellulose / tuber / for respiration / for storage;
method: mass flow / active transport;
detail: companion cells / energy requirement; [4]

(b) *named pest:* e.g. aphid;
method: spray plant with systemic insecticide;
absorbed into plant;
to all parts of the plant;
contact with pest; [4]

(c) *advantages:* effective / reliable;
can be specific;
do not need to cover the whole plant;
quick;
can be broad spectrum;

disadvantages: kill beneficial animals, e.g. slug bait killing vertebrates;
environmental implications, e.g. persist in soil;
enter waterways;
enter food chain;
bioaccumulation;
require training to use;
protective clothing needed;
specialist equipment needed;
require safe storage / disposal;

either: costs qualified, e.g. chemicals cheap, equipment expensive; [7]

[Total: 15]

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- 11 (a) *diagram to show:*
vagina;
vulva;
cervix;
oviduct funnel;

uterus / womb;
oviduct;
ovary; (max. 6)

Max. of three marks for structures with correct position, shape and scale. [9]

- (b) *advantages:*
done at correct part of cycle / more likely to take;
no need for male on farm;
cost qualified;
safer for female;
allows use of other breeds / quality males;
range of sires possible;
farmer knows when birth likely;
faster genetic improvement;
increased production;
many pregnancies possible from a single ejaculate;
male can sire after death;
reduced disease transfer;

[6]

[Total: 15]

- 12 (a) transfer of pollen;
from stamens / anthers;
to stigma / style;

Allow from male to female for one mark only. [3]

- (b) *insect flowers:* brightly coloured petals;
scent;
nectar;
nectar guides;
sticky pollen;
large pollen; (max. 4)

wind flowers: large quantities of pollen;
light pollen;
anthers / stigmas outside flower / hanging anthers;
feathery stigmas;
small, dull green flowers;
tall;
flowers at top of canopy; o.r.a. (max. 4) [7]

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- (c) plant cutting;
at node/bud;
use of rooting hormone/powder;
half in soil;
cut stem (at angle);
at least 30 cm apart;
ridges of soil/compost;
rows 75–100 cm apart;
plant during rainy season/irrigate/water;
drainage/free-draining/gritty compost;
(organic) fertiliser;
- [5]

[Total: 15]

- 13 (a)** legumes have Rhizobium;
bacteria;
fix nitrogen;
from the atmosphere;
in root nodules;
nitrogen released on decomposition;
decay provides humus for structure;
can use as green manure;
reduce use of artificial fertiliser;
crop rotations;
- [4]

- (b) plant decays;
bacteria;
plant used by decomposers;
who decay in turn;
protein to ammonium compounds;
ammonification;
to ammonium compounds;
during nitrification;
to nitrites; by nitrifying bacteria; named;
to nitrates; by nitrifying bacteria; named;
- [7]

- (c) leached by rain/excess watering;
as nitrates are soluble;
especially in porous/sandy soils;
prevent by mulching; description;
planting cover crop;
soil testing; not adding excess nitrogen compounds; detail, e.g. field mapping;
- [4]

[Total: 15]

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14 (a) *topography:* surroundings, e.g. flooding;
 aspect;
exposure: sheltered from wind;
soil: hard for foundations;
 wet or dry;
access: to road / transport / communication;
 markets;
proximity to other buildings: e.g. smell / noise;

availability of water;
 security;
 proximity to existing farm for ease of management;
 pollution risk (assessment);
 likelihood of obtaining planning permission;
 cost qualified, e.g. amount of ground preparation / need for (additional) foundations; [6]

(b) *size:* height;
 area;
construction: roof, overhanging / gutter;
 material;
walls: material appropriate to animal;
windows: style, wire / glass ;
 ventilation, wire or opening and closing;
floor: material;
door: appropriate for animal;
feeding: trough / hay racks / zero grazing system;
water supply: trough with ball valve / drinkers from pipes;

Award marks if appropriate for selected animal.
Award up to three marks for justification of choices. [9]

[Total: 15]