

**MARK SCHEME for the October/November 2009 question paper  
for the guidance of teachers**

<b>5038/01</b>	<b>5038 AGRICULTURE</b> Paper 1 (Written Paper), maximum raw mark 100
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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 must be read in conjunction with the question papers and the report on the examination.

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### Section A

- 1 (a) (i) stylet pierces tissue and sucks sap;  
from phloem; [2]
- (ii) aphid/bagrada bug/mealy bug/scale insect/other named e.g.; [1]
- (b) (i) insect ingests pathogen/sap from diseased plant;  
acts as vector/transfers virus;  
when feeding on healthy plant; [max 2]
- (ii) systemic insecticide absorbed into plant;  
travels in sap;  
ingested by insect when feeding; [max 2]
- (c) method (must be appropriate to pest named); e.g.early planting/weed control/use of predator [1]  
explanation; (*accept* for any non-chemical method given) [1]
- [Total: 9]**
- 2 (a) (i) *cause*:  
water/rain/run-off flows down furrows;  
carries soil with it;
- (ii) *prevention*:  
contour ploughing; (*accept* 'terracing') [3]
- (b) (i) *cause*:  
bare soil exposed to wind;  
and rain;
- (ii) *prevention*:  
maintain plant cover/continuous cropping;  
mulch;  
plant wind break;  
don't plough in trash; [max 3]
- (c) (i) *cause*:  
grass damaged by too much grazing/overgrazing;  
bare soil exposed (to elements);
- (ii) *prevention*:  
reduce stocking rate/don't exceed carrying capacity;  
use fencing to control grazing/introduce rotational grazing; [max 3]
- [Total: 9]**

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- 3 (a) (i) 75(%); [1]
- (ii) suitable letters used and labelled for alleles;  
 diagram to show: parents;  
 correct cross and offspring;  
 labelled phenotypes; [4]
- (b) resistant to local diseases/resistant to local conditions/ hardier/OVP; (*reject* 'resistant' without further qualification) [1]
- [Total: 6]**
- 4 (a) (i) retains moisture/maintains suitable temperature; [1]
- (ii) root hairs are damaged/OVP; [1]
- (iii) provide shade; [1]
- (b) (i) dry:  
 basin holds water;  
 mulch reduces evaporation; [min 1]  
 wet:  
 water drains from around tree;  
 avoids flooding/water-logging/rotting/lack of root respiration; [min 1]  
 plus remaining mark from either section to Max 3 for section [1]
- (ii) transpiration reduced; (*reject* 'evaporation reduced') [1]
- [Total: 7]**
- 5 (a) (i) example of ruminant; [1]
- (ii) example of non-ruminant; [1]
- (b) (i) ruminant has four-chambered stomach (*accept* named chambers);  
 non-ruminant has simple stomach/single chamber; [2]  
 (ruminant has four stomachs, non-ruminant has one stomach = 1 mark)
- (ii) ruminant eats (large volume of) plant material;  
 unable to digest cellulose;  
 food stored in rumen;  
 cellulose broken down by bacteria;  
 chewing cud;  
 non-ruminant has more varied diet/has other structure for cellulose digestion; [max 4]
- [Total: 8]**

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- 6 (a) (i) low/underground growing point/growing point not damaged by grazing animal/rapid re-growth/can withstand trampling/drought; [1]
- (ii) high protein content; (accept refs. to nitrogen fixation) [1]
- (iii) provide shade; [1]
- (iv) browsing animals/suitable e.g. such as goats; [1]
- (b) (i) promotes fresh new growth;  
clears bushes/weeds;  
kills parasites/insects; [max 2]
- (ii) erosion; because bare soil is exposed;  
damages pasture; because finer grasses are destroyed;  
fire runs out of control; danger/damage to crops/livestock/property; [max 2]
- (iii) burn at correct time of year/just before/after start of rains; so soil is damp/less damage to plants;  
avoid windy day; so less risk of fire getting out of control;  
other valid precaution; and explanation; [max 2]
- [Total: 10]**

- 7 floor above ground level/on raised legs;  
prevents entry of vermin/e.g./damp;
- baffles on legs;  
prevents rats/vermin entering/climbing legs;
- locked door;  
protects from thieves;
- roof overhang/watertight/sloping roof;  
protects crop from rain;
- feature + protection provided = 2 x 3 [6]  
(accept 'protection' mark if 'feature' mark is incomplete, e.g. roof protects against rain = 1 mark)

**[Total: 6]**

**[Total for Section A: 55]**

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### Section B

**8 dust:** in dry season dust is a problem;  
 gets into grease (around joints and bearings);  
 causes friction;  
 wears moving parts;  
 may cause binding/jamming;  
 change grease/use grease gun frequently;  
 clogs air filters;  
 change/clean air filter regularly; [max 6]

**sunlight:** dries out wooden parts;  
 causes cracking;  
 paint peels;  
 (expansion) may cause warping;  
 tyres dry out;  
 may crack;  
 store out of direct sunlight; [max 6]

**rust:** metal parts corrode;  
 become weakened;  
 blades/cutting edges no longer sharp;  
 moving parts seize up;  
 rust caused by exposure to air/oxygen and water;  
 ensure all machinery is cleaned;  
 and dried;  
 oil /grease on metal parts;  
 dry storage; [max 6]

*min 3 for each section for max 15 to be awarded, each section to max 6*

**[Total: 15]**

**9 (a)** steep land;  
 rocky land;  
 difficult to cultivate;  
 inaccessible/unsuitable for cultivation machinery;  
 unsuitable for grazing livestock;  
 timber may provide return on otherwise unused land;  
 game reserve can bring revenue;  
 from tourism;  
 may have ecological concerns;  
 OVP; [max 6]

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- (b) erosion control;  
 tree roots hold soil;  
 slow run-off;  
 and force of rain on soil;  
 provide windbreak;  
 provide shade;  
 provide timber;  
 example;  
 for building/other use;  
 provide firewood/fuel;  
 orchards;  
 for fruit crops;  
 example;  
 OVP;

[max 9]

**[Total: 15]**

- 10 (a) (i) pasture divided into camps/paddocks;  
 use of fencing;  
 cattle grazed on first camp;  
 fixed/specified time;  
 moved to second camp;  
 grass in first camp recovers;  
 repeated as cattle move to third camp;  
 one may be left ungrazed to provided dry/winter season fodder;  
*points may be given on a labelled diagram*

- (ii) cattle kept in sheds/yards/kraals;  
 grass is cut;  
 may be chopped;  
 carted to cattle;  
 area where grass is cut is left to recover and next area used;  
*must be descriptions for (i) & (ii), for max to be awarded*

[max 8]

- (b) very large areas needed for extensive grazing;  
 farmer may not have access to sufficient pasture;  
 more efficient use of grazing land;  
 pasture can be improved/better quality grazing possible;  
 supplementary feed easier to give;  
 control of rations possible;  
 improves productivity;  
 more convenient for dairy animals;  
 greater control over breeding;  
 easier to check health/deal with illness;  
 parasite control/breaks parasite life cycles;  
 OVP; (e.g. security from loss, theft, predators, damage to other crops)

[max 7]

**[Total: 15]**

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11 (a) (i) type of livestock – no mark

- (ii) detail dependent on type of livestock:–  
 feeding;  
 detail;; (e.g. type of food, amount)  
 production;  
 detail;; (e.g. commodity, amount)  
 breeding;  
 detail;;; (e.g. sire/dam, date of birth, number in litter, weaning)  
 health/vaccination/dipping/veterinary visits;  
 financial;  
 detail;; (e.g. costs, returns, examples of these)

[max 9]

- (b) housing which is easily cleaned;  
 cleaning/disinfecting housing;  
 regular removal of dung etc.;  
 cleaning feeders/drinkers/providing balanced diet;  
 providing clean water;  
 good ventilation/avoid overcrowding;  
 vaccination/use of prophylactics;  
 quarantine of new/imported stock/avoiding contact with wild animals;  
 regular veterinary checks;  
 regularly observing animals for signs of ill-health;  
 control of vectors/dipping/spraying;

[max 6]

[Total: 15]

- 12 (a) clear vegetation/tree roots;  
 wall built from impervious/clay soil;  
 prevents water seeping through;  
 much wider at the base (than the top);  
 water pressure increases with depth;  
 outer surface covered with grass;  
 to avoid erosion;  
 may use stones on inner side;  
 to avoid erosion;  
 overflow/spillway;  
 to avoid flooding;  
 concrete splash plate;  
 outlet pipe;  
 with valve;  
*points may be given on a labelled diagram*

[max 10]

- (b) channel/outlet pipe to storage tank;  
 water available for dry season;  
 water used for livestock;  
 for cleaning housing;  
 for drinking;  
 pump may be installed;  
 for irrigation;  
 via sprinkler/other;  
 water channelled directly to irrigation channels (in field);  
 OVP;

[max 5]

[Total: 15]