

**MARK SCHEME for the May/June 2008 question paper**

<p><b>5038 AGRICULTURE</b> Paper 1, maximum raw mark 100</p>	<p><b>5038/01</b></p>
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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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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) **A** = nitrification; (accept nitrifying *bacteria/nitrifying*)  
**B** = absorption;  
**C** = death/decay/decomposition/excretion/faeces; [3]
- (ii) nitrogen in air/atmosphere;  
nitrogen fixation;  
by bacteria;  
in root nodules; [max. 3]
- (b) (sandy) soil drains easily/has large pore spaces/is very porous/AW;  
(dissolved) nitrates washed out; (reject *nitrates dissolve*)  
by percolation/irrigation/rain;  
ref. to leaching; [max. 2]
- [Total: 8]
- 2 (a) (i) **A** = stamens/anthers/tassel, **B** = stigmas/silks; [1]
- (ii) **A** release/produce pollen; (accept *male gametes*)  
**B** catch/trap pollen; [2]
- (b) (i) **C** = endosperm;  
**D** = plumule; [2]
- (ii) moisture/water;  
oxygen/air;  
warmth/suitable temperature; (reject *temperature* unqualified) [3]
- [Total: 8]
- 3 (a) (i) 5700 kg per ha; [1]
- (ii) seed wasted/more cost for same return; (reject *reduce cost*) [1]
- (iii) (more plants =) competition for water;  
(more plants =) competition for minerals;  
(more plants =) competition for light/space;  
smaller ears/heads/cobs; [max. 2]
- (b) lack of depth control;  
some seeds very close together/seed not evenly spread;  
better emergence/seed in rows breaks crust easier;  
more losses to birds/pests/vermin/rodents/other e.g.; [max. 2]
- [Total: 6]

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- 4 (a) danger to operator;  
danger to animals/other people;  
risk of pollution of water/other example;  
wastage of spray; [max 3]
- (b) wearing protective clothing/example;  
correct mixing/dilution/correct rate of use;  
reading instructions;  
correct interval before harvest;  
not smoking/eating/drinking when spraying;  
care in washing out equipment;  
OVP; (e.g. do not use in rainy conditions) (reject all points referring to windy conditions or to storage precautions) [max. 3]
- (c) (i) early planting/crop rotation/example of field hygiene/use of predators/  
use of sterile males/resistant plant varieties/GM varieties;  
reject *biological control* without description of method [1]
- (ii) cost;  
pollution concerns;  
availability of chemicals;  
growing for the organic market;  
avoiding resistant pests;  
avoiding damage to beneficial insects; [max. 2]
- [Total: 9]
- 5 (a) (i) black bull = Bb;  
red cows = bb; [2]
- (ii) correct genetic diagram (punnet square or other);  
indication of phenotypes; [2]
- (b) (i) selective breeding/AW for desired characteristics;  
cross-breeding/crossing indigenous with exotic breeds;  
OVP; [max. 2]
- (ii) better conditions/improved feed/better vet. care/more  
knowledge by farmers/OVP; [1]
- [Total: 7]

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- 6 (a) (i) crop stores food after eating/before digestion;  
gizzard breaks up/grinds food; (reject *acts like teeth*) [2]
- (ii) muscular walls (churn food);  
small stone(s)/grit breaks food down; [2]
- (b) (i) 1 remove dung, 2 clean all surfaces, 3 apply a disinfectant,  
4 leave empty for 14 days;; all in correct order [2]  
(three in correct order 1 mark )
- (ii) disinfecting – kills pathogens/AW; (reject *kill disease*)  
leaving empty – time for parasites to die out; [2]
- [Total: 8]**
- 7 (a) (i) 1 **C**/spade, 2 **A**/fork, 3 **B**/rake; [1]
- (ii) **A** breaks up large soil particles;  
**B** levels the soil;  
**C** digging/turning the soil/burying weeds etc.; [3]
- (b) cleaning/washing;  
drying;  
oiling;  
to prevent rust;  
sharpening/straightening;  
tightening screws/checking heads are secure;  
avoiding leaving in strong sunlight (to avoid damage to wooden handles);  
treatment to avoid pest attack on wood;  
suitable storage;  
using for correct purpose/use correctly; [max. 5]
- [Total: 9]**
- [Section A Total: 55]**

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**Section B**

- 8 (a)** dull eyes;  
dull coat;  
discharges from mouth/eyes/nose;  
colour/state of faeces/urine;  
fever;  
abnormal behaviour (e.g. abnormal gait/isolation/weakness/inactivity);  
loss of appetite;  
reduced production;  
specific symptoms/lesions for named disease;; [max. 6]
- (b)** animals resist disease better;  
with warmth/suitable temperature;  
adequate space/good ventilation;  
helps avoid spread of parasites/airborne pathogens;  
cleaning/disinfecting housing/utensils;  
to remove/destroy pathogens/sources of infection;  
clean food;  
clean water;  
to avoid vectors/vermin;  
balanced diet;  
avoids deficiency disease;  
examples used to illustrate any of the above;;; [max. 9]
- [Total: 15]**
- 9 (a)** irrigation;  
use of fertilisers;  
liming;  
weed control;  
sowing legumes;  
re-seeding with improved grasses;  
drainage of swampy areas;  
OVP (e.g. details of pest control);  
detail of any of these;;;;; [max. 5]
- (b)** enclosure protects animals;  
land divided into paddocks;  
rotational grazing;  
detail 1;  
detail 2;  
recovery of grass;  
reduction of parasites;  
dry/winter season fodder conserved;  
strip grazing;  
use of moveable/electric fencing;  
helps avoid overgrazing/erosion; [max. 7]

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- (c) fewer stock losses;  
 higher stocking rate possible;  
 less parasite infestation;  
 greater yield;  
 more products to sell;
- [max. 3]

**[Total: 15]**

- 10** induction stroke;  
 inlet valve open, exhaust valve closed;  
 piston moves down;  
 mixture of air and fuel/petrol vapour enters cylinder;  
 compression stroke;  
 both valves closed;  
 piston moves up;  
 (air/fuel) mixture compressed;  
 ignition/power stroke;  
 both valves closed;  
 spark plug;  
 spark produced;  
 ignites mixture;  
 piston moves down;  
 exhaust stroke;  
 inlet valve closed, exhaust valve open;  
 piston moves up;  
 exhaust/waste gases forced out;
- [max. 15]

**[Total: 15]**

- 11 (a)** monoculture is commercial/crop mainly for sale;  
 inputs necessary;  
 market for products necessary;  
 may not be profitable on small area;  
 mixed farming gives greater self-sufficiency in food;  
 animal products/examples;  
 crop products/examples;  
 crop residues can be fed to animals;  
 animal dung used as fertiliser/soil conditioner;  
 less reliance on transport;  
 for food for human consumption;  
 for animal fodder;  
 for fertilisers;  
 reduces costs;  
 less risk if one enterprise fails;
- [max. 8]

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- (b) climate;  
amount/seasonality of rainfall;  
temperatures;  
topography;  
examples;  
soil type;  
pH;  
other environmental factor;  
markets;  
demand;  
transport availability;  
availability of necessary inputs;  
availability of labour;  
OVP (e.g. size of land available);

[max. 7]

**[Total: 15]**

- 12 (a)** fruit/seed dispersal;  
by wind;  
example/good description of feature;  
by man/animals;  
example/good description of feature;  
explosive/self dispersal;  
example/good description of feature;  
by water;  
example/good description of feature;  
perennial weeds;  
spread by vegetative material;  
example/description;  
when ploughing/digging/hoeing;

[max. 7]

- (b) use of herbicides;  
selective/non-selective;  
example of chemical or situation;  
post-/pre-emergence;  
example of chemical or situation;  
hoeing/hand picking (annual weeds);  
specified cultivations (such as ploughing);  
bury weeds;  
planting rate/spacing/use of cover crops;  
slashing/grazing (in plantations/orchards);  
controlled burning;  
crop rotation;  
mulching;  
use of clean seed/planting material;  
OVP (e.g. early planting);

[max. 8]

**[Total: 15]**

**[Section B Total: 45]**