

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
International General Certificate of Secondary Education

**MARK SCHEME for the October/November 2006 question paper**

**0600 AGRICULTURE**

**0600/03** Paper 3 (Extended Theory), maximum raw mark 80

This mark scheme is published as an aid to teachers and students, 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.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

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- 1 (a) No marks for examples alone  
1 mark each for a suitable example and a suitable use;;;  
examples might include horse as a non ruminant used for pulling plough, sheep as a ruminant to provide wool, salmon as a fish to provide food [1]
- (b) (i) North America [1]  
(ii) Africa;  
greatest increase in population; [2]
- (c) too mountainous;  
too wet;  
urban;  
already used for another named purpose; [max. 2]
- (d) increased use of fertiliser/energy/farm chemical;  
leading to named environmental effect; e.g. water and land pollution;  
increased use of land for agriculture;  
leading to conflict over land use a/w;  
deforestation; soil erosion; [max. 2]  
[total 10]
- 2 (a) (i) area 2  
more water available for crop; [1]  
(ii) sandier soil/unlined ditch;  
water can pass between particles in ditch wall; [2]  
(iii) lining with suitable material/compacting; [1]  
(iv) appropriate local material;  
reduces water loss from soil by evaporation; [2]  
(v) all 4 components represented on pie chart in correct proportion;  
crop segment approximately 50%; [2]
- (b) water moving down through soil;  
removing metal ions;  
removing nitrates/nitrogen;  
from plant roots;  
replacing with H<sup>+</sup> ions;  
making soil more acidic; [max. 4]  
[total 12]
- 3 (a) (i) clay/silty clay [1]  
(ii) sticky;  
holds water;  
poor aeration; [max. 2]
- (b) mix sample with water;  
add barium sulphate to accelerate settling;  
add universal indicator solution/paper/soil indicator;  
compare colour of solution with chart; [max. 3]
- (c) (i) sweet potato [1]  
(ii) sweet potato and sorghum; [1]  
(iii) add lime;  
reference to timing/method of application; [2]  
[total 10]

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- 4 (a) (i)** correctly labelled anther;
- (ii)** pollen tube;  
growing down/towards;  
enter ovule;  
micropyle;  
fusion;  
of male and female gametes; [max. 4]
- (b)** high quality parents;  
named quality;  
crossed;  
f1 plants having qualities of both parents;  
repeat over generations [max. 3]
- (c) (i)** the allele whose qualities are expressed in the phenotype a/w; [1]
- (ii)** genotypes HH/or appropriate letters;  
hh;  
gametes H H h h;  
genotypes Hh Hh Hh Hh [4]
- (c)** yield;  
cost;  
disease/pest resistance;  
climate tolerance;  
quality of crop/consumer preference; [max. 2]  
[total 15]
- 5 (a) (i)** E; [1]
- (ii)** A; [1]
- (iii)** untreated infected by another pest/blue-grey aphid attracted to E/new infestation/ovp; [1]
- (iv)** 10 x 80/200;  
4g [2]
- (b) (i)** named root crop  
method of cutting/uprooting/named tool;  
method of collection; [max. 2]
- (ii)** two conditions e.g. dry/cool/away from rats/ovp;;  
qualification for each of two conditions;; [4]  
[total 11]
- 6 (a)** prevent selective grazing;  
prevent over grazing;  
allows named treatment of pasture;  
allows pasture to rest;  
breaks life cycle of (animal) pests;  
prevents compaction; [max. 4]
- (b) (i)** e.g. keep predators from poultry/rabbits;  
suitable sketch of mesh fence;  
e.g. windbreak  
suitable sketch of hedge fence; [4]  
[total 8]

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- 7 (a) (i) correctly shaded rumen;  
ignore caecum if shaded
- (ii) break down large molecules;  
into smaller molecules  
suitable for absorption;  
ovp for details of ruminant digestion; [3]
- (b) during growth higher protein component;  
in production rations have more protein/qualified inclusion of carbohydrate;  
maintenance rations – enough energy to keep animal healthy;  
all need enough vitamins/minerals and water; [max. 3]  
[total 7]
- 8 (a) (i) birth times related to named change in climate;  
reason 1 e.g. more food/water for young animal/mother for milk production;  
reason 2 e.g. avoid predators/pests;  
named pest;  
ease of management/allows greater care of stock;  
allows better control of disease; [max. 3]
- (ii) date of mating;  
age of animals;  
name of sire;  
progeny testing;  
record of performance;  
use of AI/super-ovulation/other named technique; [max. 2]
- (b) ascertain viability;  
provide an order for activities;  
state success criteria/estimate profit and loss [max. 2]  
[total 7]