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## FOREWORD

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This booklet contains reports written by Examiners on the work of candidates in certain papers. **Its contents are primarily for the information of the subject teachers concerned.**

# AGRICULTURE

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## GCE Ordinary Level

<p>Paper 5038/01</p>
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<p>Paper 1</p>
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### General comments

There were some scripts of very high quality, where candidates showed detailed knowledge of the subject with apparent relevant practical experience on which they were able to draw. It is a pity that this practical experience appears to be lacking for a considerable number of candidates, however. The opportunity to apply or, at least, to see at first hand agricultural principles in the keeping of livestock or growing of crops, on however small a scale, is an important aspect of the subject. It is also important that all areas of the syllabus are covered, so that candidates have the chance to attempt all questions. All candidates seemed to have had enough time to complete the paper and virtually all attempted the three questions required in **Section B**. Those few candidates who attempted only two appeared to be unable to find a third question that they could answer, rather than having insufficient time. Candidates must read questions carefully and ensure that their answers are relevant to what is asked. Material which does not answer the question attempted will not gain marks.

### Comments on specific questions

#### Section A

#### Question 1

- (a)(i) The correct answer was 'cabbage' or 'leafy vegetable'.
- (ii) The reason is that nitrogen is the mineral associated with leafy, vegetative growth. A fair number of candidates were able to gain both marks.
- (b)(i) Candidates should have completed the diagram using the crops shown. In order to gain all the marks, the cabbage (leafy vegetable) crop should have followed the pea (legume) in the rotation. Some candidates used crops other than those given, seemingly chosen at random, often with two root crops in the rotation and sometimes a perennial crop such as citrus. This does not indicate a grasp of the idea of crop rotation.
- (ii) Where candidates understood the principle, they were able to give good reasons, such as a reduction in the incidence of pests and diseases and better use of soil nutrients. Where candidates had shown 'cabbage' following 'peas', they were also able to give the nitrogen benefit to the cabbage as a reason. 'Increases soil fertility' is not sufficient to gain a mark – mention of the role of legumes would be necessary.

#### Question 2

- (a) It was clear that many candidates were unfamiliar with a triangular diagram of this type. A fair number were able to gain all three marks, however. The correct answers were: *clay*, *sandy loam* and *silty clay loam*.
- (b) It was clear that many candidates had never carried out a handling test on soil. There were descriptions of sedimentation, the use of soil sieves and pH tests – none of these were relevant. Where candidates described the correct type of test, marks were lost when they forgot to mention whether the soil was dry or moist or did not link results to soil type.

**Question 3**

- (a)(i) Many diagrams had no label. Most who did label the required structure correctly marked the anther. A few confused anther and stigma.
- (ii) The process at **X** was *fertilisation*. This was generally well-known but the commonest incorrect answers were *ovulation* or *pollination*.
- (b)(i) This was well-answered, with candidates including the essential point that pollen is transferred from one plant to another. Candidates should note, however, that 'plant' is not synonymous with 'flower'.
- (ii) This was less well-known but a fair number of candidates referred to increased variation and to hybrid vigour.

**Question 4**

- (a)(i)(ii) Many candidates were able to label these structures correctly. The commonest error was to label the gizzard as the proventriculus.
- (b) There were many good descriptions of the muscular action of the gizzard coupled with the presence of small stones.
- (c) More candidates could have related their answer to chickens, particularly when calcium was mentioned as surprisingly few candidates referred to its role in eggshell formation. However, candidates were generally able to name two minerals and give their importance although this was often to animals in general.

**Question 5**

- (a)(i) The answer was 2.45 kg ( $\pm 0.05$ ). This was correctly read from the graph by most candidates.
- (ii) Again, candidates were generally able to give the correct age of 11.5/12 weeks. It is essential that, in questions such as (a)(i) and (ii), units are stated.
- (b) This was poorly answered. Few candidates referred to data in the graph in their answers. This shows that growth has slowed at 10 weeks. As the chickens have almost reached their maximum weight and are big enough, it is more profitable to slaughter them at this stage than to continue feeding them for little gain. This is a variant on the *diminishing returns idea* that candidates are generally familiar with in terms of crops but seemed unable to apply in this case.

**Question 6**

- (a) There were some excellent answers where candidates noted the positions of the growing points on the two plants and the way that they would be affected by grazing.
- (b)(i) Answers that simply repeated diagram labels, such as 'grass re-grows', did not gain marks. Candidates should be able to give specific advantages of rotational grazing, as compared to other methods, such as the prevention of selective grazing or of overgrazing.
- (ii) Candidates did not seem to understand that Camp 4 was ungrazed for much longer than the other Camps in the rotation, whilst it was being rested. This would allow for the grass *roots* to regenerate. It would also allow the grass in this camp to be used for fodder during the dry season. This was mentioned by only a few candidates.
- (iii) The idea of killing pests was the commonest correct answer. Others could have been the promotion of new grass growth or the removal of unwanted scrub.

**Question 7**

There were some candidates who clearly had no knowledge of simple genetics and had no idea how to answer the question. It is essential to cover all areas of the syllabus to have the best chance of a good mark.

- (a) Gametes were **R** and **R**, **r** and **r**.
- (b) The diagram should have shown **Rr** x **Rr**. The offspring were then **RR**, **Rr**, **Rr**, **rr**. It was necessary either to explain why **rr** would arise and give white flowers or to label offspring, for full marks. Candidates struggled with explanations and, unfortunately did not label the offspring, so did not gain the final mark. (The diagram could take the form of a punnet square or a web diagram.)

**Question 8**

Candidates missed some obvious points in the comparisons. Too many included only cost and durability. These are valid points but aspects of drainage, shown in the floor diagrams could have been mentioned as could the fire risks of wood and thatch. Availability of materials and ease of cleaning were referred to by a number of candidates but not ease, or otherwise, of construction. There were good points that included specific risks, such as the action of termites. Many candidates tried to introduce the idea of good and bad insulation but often did not really grasp the principles and so failed to make clear points.

**Section B****Question 9**

- (a) Candidates described the actions taken but some failed to give the reasons for these, as the question required. A number of candidates gave details of planting rather than of seed bed preparation. Again, this did not answer the question set.
- (b)(i) Once again, some candidates did not read the question carefully and named a disease rather than a pest. A specific pest should be named – ‘caterpillar’ is really too imprecise as candidates should know which insect’s larvae attack a named crop.
- (ii) Whilst many candidates described the damage caused clearly and accurately, a substantial number clearly knew little about the pest named, stating, for example, that aphids bite holes in leaves.
- (iii) If chemical control is used, then candidates should be able to name an appropriate chemical and indicate the method of application. If the pest is an insect, then ‘insecticide’, if not a named chemical, should be mentioned and not ‘pesticide’. Other methods, such as weed control or the use of predators, are equally valid.

**Question 10**

- (a) Most candidates were able to give an appropriate disease for the type of livestock named. However, a few gave a parasite rather than a disease.
- (b) There were many good accounts, mentioning specific micro-organisms and the ways in which they are spread.
- (c) Some candidates clearly knew little about the disease that they had given and could only list general symptoms of disease rather than ones specific to the disease named. There was some confusion, by a number of candidates, between the symptoms and causes of coccidiosis and of Newcastle disease, in poultry. There were, however, some excellent descriptions of mastitis and of blackleg in cattle.
- (d) Again there was frequently a lack of specific knowledge here. For example, isolation is not an option in cases of Newcastle disease, where the whole flock has to be destroyed – this was not mentioned. The importance of hygiene is a good general point in most diseases but particular actions and the use of specific drugs did not seem to be widely known. An exception seemed to be those candidates who described mastitis, who often gave good accounts of specific actions in terms of milking hygiene and also knew about the use of antibiotics.

**Question 11**

- (a)(i) A few candidates confused this with crop rotation but most gave a clear, correct definition.
- (ii) Most candidates were able to list points such as savings on fertiliser and livestock feed by using animal dung and crop residues respectively. The spreading of risk across a number of enterprises, as well as the practical use of animals for draught purposes were also frequently-made points.
- (b)(i) The greater need for food as population increases, and the pressure on agricultural land as demand for housing and other development rises were often well-made points, although the link between the two and the need for efficient land use was not always clearly stated.
- (ii) This was not very well answered, with many candidates concentrating on industrial uses of land, when the question made it clear that this was not the answer required. If candidates had thought about reasons for unsuitability for crops and livestock, such as steep, rocky terrain or swampy ground, they could have made more suitable suggestions. There were some good answers, where candidates discussed the possibility of forestry on steep slopes. Nature reserves and game parks were also good suggestions.

**Question 12**

- (a) This was very well answered in most cases. There was good use of clear diagrams with explanations to clarify individual points.
- (b) This was rather less well known. Candidates should be able to give a clear description of osmosis as the means by which water enters root hairs. They should also know that mineral salts are taken up by an active, not a passive process. Many candidates wrote, wrongly, that minerals pass in, with water, as part of osmosis. The question asked specifically for uptake by plant roots so details of transport through the stem and leaf were not really relevant here although many candidates concentrated on this.

**Question 13**

- (a)(i) Candidates gave good accounts of the precautions needed for storing farm chemicals but some candidates described precautions needed for their use. This was not relevant to the question set so did not gain marks.
- (ii) Again, candidates gave good accounts but some could have made more of the different requirements needed for storing fuels, because of their highly flammable nature. Some answers simply repeated the points made in (i).
- (b) The need for cleaning, methods of protection from rust, tightening nuts and bolts, sharpening and adjustments were all well-made points. The use of oil or grease should be qualified by specifying that it is for rust prevention or for lubrication of moving parts. Some candidates either misread or misunderstood the question and described the servicing and maintenance of a tractor rather than a plough.

<p><b>Paper 5038/03</b></p>
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<p><b>Practical</b></p>
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**General comments**

All candidates attempted all parts of every question - indicating that there was sufficient time allocated for the examination. There were no cases of candidates infringing the examination rubric.

It would be useful for candidates to be reminded of good examination technique with regard to taking account of the mark allocation for each question in their responses. Again, some candidates continue to provide responses for practical questions by stating what they thought should be the outcome, as opposed to describing their actual observations.

**Comments on specific questions****Question 1**

- (a)(i) Approximately half of candidates were able to record successfully both an initial temperature and a raised temperature after the experiment. Several candidates described temperature rises far in excess of anything that could be expected from the burning of a single peanut. A significant minority of candidates were unable to perform the necessary subtraction accurately to determine the temperature rise.
- (ii) Most candidates were able to state why it was useful to stir the water during such an experiment.
- (iii) Many candidates were aware that the temperature of the glass of the boiling tube would be greater than that of the water, some describing the possible damage to the thermometer if it was left to rest on the glass. Some candidates believed incorrectly that the weight of the thermometer would cause the heated glass of the boiling tube to shatter.
- (b) In order not to double penalise candidates who had performed the experiment incorrectly, the stated temperature rise from the experiment was accepted in the calculation irrespective of whether it was feasible. Many candidates were able to perform the calculation accurately, but the most common error was to use the starting temperature for the experiment rather than the temperature rise.
- (c) Only the most able candidates were able to offer two reasonable reasons for energy loss and improvements on how to reduce the loss. Many candidates stated that they had not followed the instructions properly and were not awarded any marks.

**Question 2**

- (a)(i) This question was answered well by candidates of all abilities.
- (ii) This question was answered well by candidates of all abilities.
- (iii) This question was answered well by candidates of all abilities.
- (b)(i) Only the more able candidates were able to present their results in a table. It appeared that many candidates had tried to guess the outcome of the experiment owing to their description of a variety of incorrect results that had nothing to do with this experiment. It suggests that some candidates may not have attempted any practical work for this question.
- (ii) Again only the most able candidates were able to offer any conclusion to this experiment. Many candidates stated or restated the results. There appeared to be confusion between results and conclusions.
- (iii) Candidates were awarded a mark for any reasonable suggestion for the difference between any stated results for their experiments. However, some candidates merely restated the results.

**Question 3**

- (a)(i) Most candidates were able to state that there are more impurities in tap water than distilled water. Only the most able candidates were able to explain how such impurities might affect the pH in the experiment.
- (ii) In some cases, this question was answered very well. In others, only the most able candidates were able to state the role of barium sulphate in the pH test.
- (iii) This table was completed accurately by only the most able candidates. For many candidates there was no correlation between the final colour of the solution and the suggested pH. For a minority of candidates, it appeared that the tubes had not been given the opportunity to settle; in others it appears that the tubes were never shaken.
- (b)(i) This question was answered well by candidates of all abilities.
- (ii) Only the most able candidates were able to describe the effect of soil acidity on a crop. Many candidates failed to mention any effect of acidity on yield. The most common misconception was that soil acidity affected plants roots in a similar manner to laboratory acids reacting with metals such as magnesium.