

AGRICULTURE

GCE Ordinary Level

<p>Paper 5038/01</p>

<p>Paper 1</p>

General comments

Most candidates showed good knowledge of subject material in at least one area but many marks were low because candidates seemed not to have covered the syllabus content fully. As this examination is in a similar format to that used previously at this session it was no surprise that there were very few rubric infringements by candidates. However, there were one or two instances of candidates answering the questions of **Section A** on separate paper. This makes for unnecessary difficulty for candidate and Examiner alike. In addition, a few candidates did not answer the correct number of questions in **Section B**. Candidates should be encouraged to read the instructions, carefully, before attempting to answer any questions. Most candidates seemed to have no problems in completing the paper in the time allowed and the standard achieved by some candidates was very high. There tends to be a weakness in answering questions requiring application of knowledge rather than straightforward recall of facts. Some candidates write all they know about a particular subject mentioned in a question, without selecting what is relevant. In **Section B**, this means that candidates may have written very long answers but gained few marks. Although there were some excellent answers in this section, some were very repetitive. Candidates should make points once, clearly candidates should read questions carefully and establish exactly what is being asked. In some Centres it is clear that poor English skills make this difficult for candidates, who may not be able to demonstrate their knowledge to its fullest extent.

Comments on specific questions

Section A

Question 1

- (a)(i) Structures **A**, **B** and **C** were endosperm, plumule and radicle, respectively. Naming **A** as *cotyledon* was a common error.
- (ii) The function of **C** is to develop into the root. Candidates should not confuse the role of the embryonic structures with those of the plant part once it has developed.
- (b) Few candidates had any idea of why sowing at inappropriate depth would affect germination. Most suggestions related to effects on growing plants, such as anchorage and access to nutrients or light. Many candidates thought that light is needed for germination. Shallow sowing would make seeds vulnerable to drying out and to birds eating them whereas sowing too deep would mean that seeds may run out of stored nutrients before the shoot reaches the surface.
- (c) Answers were often not clearly expressed, but many candidates attempted to make the point that sowing in rows would lead to more even spacing, which would then enable weeding, spraying and harvesting to be carried out more easily, as well as ensuring more even access to nutrients for all plants. One clearly-made point was all that was required.

Question 2

- (a)(i)(ii) **X** was the crop and **Y** was the gizzard. A large number of candidates could not identify these structures, with **Y** named as proventriculus being a common error. As candidates could not name the structures correctly it was no surprise that they were also unable to state their functions. The function of the crop, as a storage area, was more often seen, even when candidates had named it incorrectly but the role of the gizzard was not widely known.

- (b)(i) A number of candidates did not read the question carefully and failed to name the type of livestock that their answer referred to. Sources of carbohydrates were not always appropriate to the animal named but there were many good answers here. Candidates named the missing food group as protein and were able to suggest a legume as a suitable source. The use of fat as an energy store was also well known.
- (ii) Some candidates did not read the question carefully, failing to notice that the components that they named needed to be different from those in the table. *Vitamins*, *minerals* or *water* were possible responses.

Question 3

- (a)(i) Candidates seldom gave clear definitions of *monoculture* or *crop rotation*. The idea of succession on one piece of land, either of the same crop or different crops, should be stated.
- (ii) Most candidates understood the advantages of crop rotation, with maintaining soil fertility and breaking pest and disease cycles being the commonest reasons given.
- (b)(i) A good number of candidates mentioned nitrogen fixation but few expanded their explanation to mention root nodules. Some confused nitrogen-fixing bacteria with nitrifying bacteria. A large number of candidates did not appear to register the fact that the tree was leguminous and referred to the fallen leaves providing humus to improve fertility.
- (ii) Many candidates were able to associate the idea of a leguminous tree with seeds containing a high proportion of protein, even though they had not associated this with nitrogen fixation in (i).

Question 4

- (a)(i) Wire mesh would provide ventilation but would also allow the entry of rain and wind, as well as flies or other insects. Suggesting that larger pests, such as rats, could enter this way, was not accepted, as the mesh used should be small enough to prevent this.
- (ii) Many candidates tried to express ideas about the nature of thatch as an insulator but few actually used this term, which would have made answers clearer. The commonest accepted disadvantages were fire risk and lack of durability, with some also mentioning hygiene problems. Many candidates suggested that this type of roof would leak but this should not occur if the roof is properly constructed.
- (b) Relatively few candidates scored full marks here. The question referred specifically to preparation of the poultry house, so references to cleaning out old litter, washing, disinfecting, treatment for parasites and leaving the house empty for a time were all points that could have been made. Most candidates simply referred to "cleaning out the house" before "providing fresh litter" and "providing fresh food and water". More detail of "cleaning out" is needed.

Question 5

- (a)(i) Many candidates did not know which end of the pH scale denotes acid conditions, so chose the wrong crops. The question also specified crops **needing** acid conditions, so those that would tolerate them but also grow in neutral or alkaline conditions were not accepted. Millet, rice, sweet potato and cowpeas were the only crops that were shown as growing only at pH 6.5 or below.
- (ii) Many candidates were able to suggest the use of lime as a means of raising pH but large numbers thought that the effect could be achieved by the use of fertilisers.
- (b) Only a very few candidates seemed to know that alkaline soils can make nutrients in the soil unavailable to plants. Many simply said that the soil is too alkaline.
- (c) It was disappointing that so few candidates seemed to have any experience of soil testing. When soil is mixed with water for this test, the use of distilled water should be specified. Many candidates suggested using litmus paper to test the liquid produced but this would not show pH, which was what the question required. Litmus is not synonymous with Universal indicator.

Question 6

It was clear that this is an area of the syllabus that has not been covered by some candidates, as they left the question blank. Those who had studied this answered well and many gained full marks.

- (a)(i)(ii) Many candidates named only one genotype for yellow-seeded plants, although answers in (b) indicated that they were aware of both **AA** and **Aa**. Where candidates were able to answer the question as a whole, most gave the correct answer, **aa**, for white-seeded plants. Some candidates used symbols other than **A** and **a**. In this case marks cannot be given unless the candidate gives a key to indicate what the chosen letters mean.
- (b)(i) Candidates who had studied this area of the syllabus answered correctly, showing the cross between **Aa** and **aa**.
- (b)(ii) The question asked for a proportion, not a ratio, so the answer looked for was $\frac{1}{2}$ or 50%.

Question 7

Again, this was an area that had clearly not always been covered. Some candidates left the question blank. Where the material had been studied the question was well answered.

- (a) This was the exhaust stroke. Most answers were correct but some confused the two valves so thought that this was induction.
- (b) **B**, **C** and **D** were *the exhaust valve, piston and crankshaft*, respectively. These were correctly named by many but the valve was sometimes misidentified as the inlet valve.
- (c) **A** was generally identified as the spark plug and its function was well-known.
- (d) Only a handful of candidates could give a correct answer here. Many candidates suggested that diesel engines do not need fuel or that ignition does not take place. The difference in the way in which a diesel engine functions did not appear to be understood.

Question 8

- (a)(i)(ii) *Maize* and *weeds* were the correct answers here and given by most candidates.
- (b) Competition for water, nutrients and light or space were the factors looked for. References to harbouring insects or disease were not accepted as these were other factors shown in the pie charts. Some candidates did not read the question carefully and gave a cause of loss of yield for each of the factors shown.

Section B

Question 9

- (a) There were some very good answers where candidates provided a wide range of reasons for forestry and game reserves, both in terms of using land unsuitable for other forms of agriculture and in environmental and economic terms. However, some candidates did not appear to understand the term *game reserve*.
- (b) Most candidates were able to name a number of factors, including topography, soil features, climate, demand, land area available, labour requirements and access to markets. Some answers would have benefited from a little more detail, where a very limited number of factors was mentioned. Climate, for example could have been described in terms of temperature range and amount or distribution of rainfall, related to named examples of crops. Candidates were more inclined to give this sort of detail when referring to soil considerations.

Question 10

Most candidates named the crop, as the question required. Some, however, did not read the question carefully and omitted this.

- (a) Many candidates described planting and after care of the crop, rather than soil preparation before planting or sowing. This should have included the actions needed to achieve a suitable tilth and any inputs **before** planting. References to planting distance were irrelevant here. Candidates should ensure that responses answer the question set.
- (b) Some candidates named a disease rather than a pest but most answers were appropriate to the crop named. Some candidates were vague about the damage caused by the pest named. Quite a number thought that aphids either eat or make large holes in leaves. Some candidates confused the terms *herbicide* and *fungicide* with *insecticide*.
- (c) This was less well answered. Candidates mentioned financial records but gave little detail of these in terms of costs and selling price. Few candidates were able to state the importance of record keeping beyond the idea of knowing the profit or loss status. There were few references to year on year comparisons enabling future planning. A few candidates referred to livestock enterprises when the question specified a crop-growing enterprise - another instance of candidates not reading the question carefully.

Question 11

- (a) This was a popular question and very well answered in many cases. Candidates seemed to be very well aware of the precautions needed, both when spraying and storing chemicals. A weakness in a few cases was that candidates described protective clothing simply as boots and gloves, when the most important items would be protection for the eyes, nose and mouth.
- (b) Candidates mentioned advantages in terms of cost, personal safety and environmental damage but were sometimes a little vague in their answers. Few referred to the problem of resistant crops arising, for example.

Question 12

- (a) Answers were very disappointing. Most candidates described a post and wire fence but few stated the material used for posts or gave any detail about how these would be set in the ground. The sequence of actions - constructing corners first and methods of bracing - were seldom referred to and dimensions, where given, were frequently inappropriate. A number of candidates clearly did not understand the question as they described the construction of an animal house rather than fencing.
- (b) Many candidates mentioned rotational grazing but, whilst some described this, details of the benefits were less often seen. The idea of controlling animals, preventing them wandering and becoming lost or damaging crops was mentioned by many candidates, however.

Question 13

- (a)(i)(ii) Most candidates named appropriate livestock products (including feathers and skins, as well as the more obvious milk and meat) and their uses, but details of processing and storing were lacking. Candidates confused the processes of pasteurisation and sterilisation of milk. Some candidates gave good detail of meat processing but others could say little more than the need for refrigeration.
- (b)(i) Some candidates named disease-causing organisms rather than how they were spread. As the question specified livestock disease, it was expected that candidates would answer in terms of contaminated food or water and contact with infected livestock rather than make general points about "water-borne" or "air-borne" factors and "contagious disease". Greater use of examples would have made answers clearer. Some candidates did this to good effect when referring to parasites as vectors or spread via poor equipment hygiene in relation to a specific disease, such as mastitis.
- (ii) Answers here were better, with many candidates referring knowledgeably to quarantine, isolation, vaccination and aspects of hygiene. A few candidates described only dipping and spraying animals for parasites. Although the control of parasites as vectors is important, it is only one aspect of disease prevention so would gain few marks by itself.

General comments

Most 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 more Centres to provide increased instruction regarding 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.

No Centres described any difficulties in providing the necessary reagents or specimens, but two Centres described difficulty in providing a method of heating necessary for **Question 2**.

Comments on specific questions

Question 1

- (a)(i) Approximately half of the candidates were able to demonstrate that they could describe a method of counting, account for all of the leaves and ensure that the two columns correlated. Some candidates ignored the tally column completely or described a method of tally that was neither systematic nor likely to be accurate. Some candidates did not account for exactly 25 leaves; others had tally and number of leaves columns that did not match.
- (ii) Nearly all candidates gained this mark providing that their addition was accurate. Candidates were not double penalised if they had made an error in Table 1.1.
- (iii) Many candidates demonstrated the ability both to work out a percentage and to show their workings. Very few candidates neglected to describe their method of working. The most common arithmetical error was to divide by 40 (the maximum width of the leaves) rather than by 25 (the total number of leaves).
- (b) Candidates suggested a variety of acceptable reasons for different leaf widths. Most commonly was to refer to the fact that leaves were not the same age. Candidates suggested that some leaves described how leaves on the sunny side of a plant may grow quicker. There were a variety of other acceptable suggestions. Unacceptable suggestions included that the leaves came from different plants or species or provided vague responses describing non-scientific methods of irrigating and/or fertilising one part of a plant, but not another.

Question 2

There was some evidence that candidates were attempting to identify the cations and anions without any practical activity. Additionally several candidates ignored the instructions totally and appeared to have performed their own experiments. Some candidates were not prepared for 'no result' control experiments. Other candidates carried out the experiments perfectly, but were not able to make appropriate conclusions from the practical tests.

- (a) Most candidates were able to describe the results of this test. There was some confusion between undissolved reagent and a milky precipitate caused by a chemical reaction.
- (b) Most candidates were able to identify the presence of ammonium ions in AS1, but far fewer were able to describe the 'no result' provided by AS2. Consequently the quality of conclusion was far higher for AS1, conclusions for AS2 were contrived too often.
- (c) Candidates had few problems in carrying out the tests for the production of carbon dioxide from a carbonate. However, relatively few candidates went on to conclude the presence of a carbonate, rather reiterating the presence of carbon dioxide.

- (d) Candidates had few problems in either carrying out this test for sulphate or making an appropriate conclusion.
- (e) Few candidates related the findings of first four sections of this question to an appropriate suggestion for an agricultural use of AS2. Unacceptable suggestions included pesticide, weedkiller, food supplement and fertilisers despite no reason to support any of these suggestions.

Question 3

- (a) This question was answered well. Most candidates scored at least 2 out of 3 marks. The most common mistake was the omission of units from the column titles.
- (b) Many candidates described their method rather than explained their results. It was common for candidates to gain two marks by differentiating between the particle sizes in the two samples, but very few described how this might affect the results of the experiment.
- (c) Relatively few candidates understand the term cultivar. Those candidates who understand the term had no problem with this question. Too many candidates think that cultivar is soil type.