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FOREWORD

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

GCE Ordinary Level

Paper 5038/01

Paper 1

General comments

Whilst many candidates show a good knowledge of the subject, marks are often lost because candidates do not take sufficient note of what the question asks, so that answers are not relevant, although the facts that they contain may be correct. This is particularly noticeable when candidates are asked to use the diagrams or data provided when answering the question. This is frequently ignored and candidates give general answers on a topic, taking no note of what is required. Some candidates answer well on the structured questions in ***Section A*** but are less able to give coherent answers when tackling the free-response questions in ***Section B***. Sometimes it is clear that this is due to lack of sufficient knowledge to write an extended answer but difficulty in writing answers of this type, in what may be a second language, also plays a part. It may be that candidates would benefit from more practice in answering this type of question before the examination. Candidates should ensure that when they draw diagrams to illustrate their answers, these are sufficiently annotated to show the Examiner that the candidate understands the material they are intended to convey.

Comments on specific questions

Section A

Question 1

(a) Most candidates identified the structures correctly as **A** – ovary, **B** – fallopian tube (oviduct), **C** - uterus (womb).

(b) The correct position for **X** should have been clearly on the fallopian tube. The commonest error was to place it in the uterus. A few candidates marked **X** on the ovary.

(c) Most candidates knew that the eggs or ova are produced here but many lost marks by referring to them as ovules. Few candidates gained the second mark by mentioning the production of hormones.

(d) Many definitions of *lactation* were not precise enough. For example, “when young feed on milk” does not define lactation as it could equally be a description of suckling. “The whole period of milk production by the female” was the best definition given. Some candidates seemed to think that lactation is only the production of colostrum. The definition of *weaning* was less well known. Reference to a change in food, from milk to solid food, or separation from the mother so that the young animal does not have access to suckling was required.

Question 2

(a) The correct answers were **A** – precipitation (rainfall), **B** – evaporation, **C** – transpiration. Common errors for **A** were condensation and percolation. **B** and **C** showed fewer errors.

(b)(i) Generally candidates interpreted the graph correctly and stated that the rate increased but some appeared to ignore the graph and make an assumption that a mulch would prevent water soaking into the soil. This was indicated by their answers to the second part of the question.

(ii) Many candidates concentrated on the reasons for using a mulch rather than its effects. This reflects a reluctance by candidates to apply knowledge to a new situation or data and deduce an answer, rather than just writing recalled facts.

(c) Candidates who understood the required conditions for germination were able to score both marks here. A number of candidates made much of the nutrients that a mulch might add as it broke down but, whilst this could be of benefit to established plants, it would be of no significance in germination.

Question 3

(a) The order given should have been **C A D B**.

(b)(i) Most candidates were able to give two examples but these were not always clear. "Eyes" or "feeding" does not indicate what would indicate good health or ill-health.

(ii) "Isolation of sick animal", "disinfecting housing" and "calling a vet" were all good answers commonly given. However, "vaccination", "killing the suspected animal" and "give of antibiotics" would not be appropriate where disease is only suspected. These were also commonly given answers.

(c)(i) Most candidates named a type of livestock and the parasites mentioned were usually appropriate to the livestock named. "Worms" is too vague to get a mark. A number of candidates made it clear that they had little knowledge of the topic when they named "earthworms" as a parasite.

(ii) The question required that the problems related specifically to the parasite named so general symptoms of ill-health were not sufficient. Ticks were the commonest example named and many candidates stated that they suck blood but did not indicate why this is a problem to the animal – anaemia may result. Transmission of disease and damage to skin could then be given as further problems for this example.

Question 4

(a)(i) Very few candidates were able to identify this process as *artificial selection* (*selective breeding*). Common incorrect answers were "evolution", "natural selection", "artificial insemination" and "domestication".

(ii) Candidates who did not understand the significance of breeding simply gave an account of farm records of feeding, treatments etc., relating this to profits. This was not relevant to the question. There were, however, some good accounts by candidates who realised the importance of selecting parents for good qualities, such as production, fertility and health.

(b) Inevitably, some candidates confused genotype and phenotype. Many gave correct definitions but did not then go on to use the example given to illustrate their answers, which was what the question required for full marks to be gained.

Question 5

(a)(i) Many candidates described the cleaning processes shown rather than stating the reasons for them, that is the exclusion of air and moisture to prevent rust.

(ii) *Describe and explain* implies that a candidate must describe an action, such as dry storage of wooden-handled tools and then explain the reason – to prevent rotting. Generally candidates answered this section well but a few did not understand the nature of processes that they mentioned. For example, "galvanising" was mentioned in a number of answers. This is inappropriate for wood.

(b) Most candidates knew the use of saw, hammer and screwdriver. A small number of candidates did not read the question carefully and simply named the tools, rather than stating their use.

Question 6

(a)(i) Few candidates seemed to be aware of the significant increase in surface area, for absorption, provided by root hairs.

(ii) Most candidates knew that this process is *osmosis* but descriptions were inaccurate. Candidates must make it clear that water moves from a weak solution to a more concentrated solution (relating this to conditions inside and outside the root hair cell). "Movement of water from a high concentration to a low concentration" is ambiguous as it is not clear whether concentration refers to water or solute.

(b)(i) Most candidates interpreted the graph correctly, stating that yield increased. In a few cases candidates incorrectly referred to seed rate increasing, rather than yield.

(ii) The correct responses were “increase” and “decrease” respectively.

(iii) The idea of competition between plants which were growing was not understood or expressed by many candidates. Most concentrated on germination, which would have been little affected by competition.

Question 7

(a)(i) Candidates needed to describe the insect shown as piercing *and* sucking.

(ii) Generally, candidates realised the significance of a pesticide which is absorbed into sap, though many described this as absorption by the roots rather than by the foliage.

(b) The effect on beneficial insects, the development of resistant pests and costs were common correct answers but there were many rather vague references to “poisoning” without specifying how this could occur.

Section B

Question 8

(a) Most candidates who attempted this remembered to name the crop to which their answers referred. Descriptions of soil preparation and planting distance were not relevant and did not gain marks – candidates must read the question carefully. There was lack of detail in terms of why a particular climate would suit the named crop. “Our climate is tropical and suits this plant” is insufficient – candidates should give details of temperature range and amounts of rainfall with seasonal variation. Soil type and pH should also be related to particular needs of a crop, for example whether the crop requires a deep soil or is affected by stony soil could be mentioned. The use of the term “humid” should be reserved for describing the amount of water in air and not how wet a soil is. This was a common incorrect usage by many candidates.

(b)(i) Most candidates knew the meaning of crop rotation and its advantages.

(ii) There were few clear diagrams, although the question asked for this. These should have shown the sequence of the rotation, by giving a diagram for each year. It was assumed that three vegetables would be grown in the garden in each year and these would then be rotated through different beds but many candidates assumed that only one crop per year would be grown. This would be more appropriate in a field situation. The crops named were not always appropriate to a small vegetable garden but were field crops. Most candidates mentioned inclusion of a legume in their rotation but not all gave a correct example. The best answers included reasons for the order of the rotation, for example growing a leafy vegetable after a legume to take advantage of the added nitrate.

Question 9

(a)(i) Candidates had no problems naming livestock and listing products, although by-products such as manure should be avoided as these are not the products for which the animal is primarily kept.

(ii) There were some good accounts of processing and storage, especially the actions taken after slaughtering chickens and their preparation for sale. The importance of cold storage was frequently mentioned. Descriptions of treatment of milk and meat from cattle were less well described, however.

(b) Again, accounts relating to poultry were often good, with appropriate detail of different feed types but candidates who used other examples seemed to have less detailed knowledge. The reasons for different rations at different times in the animal’s life as well as details of content and quantities were expected for an answer which would gain full marks.

Question 10

(a) Some candidates who attempted this question did not know what the term *extensive grazing* means. Several described the advantages and disadvantages of zero grazing. Those who answered correctly gave good accounts of the pros and cons such as cost, labour requirements, overgrazing, selective grazing and their effects and the difficulties of controlling mating and disease among the animals.

(b) Most candidates drew a diagram to illustrate their answers. These usually consisted of four squares labelled as camps 1 to 4 and showed arrows but the meaning of 'camp' and the purpose of the arrows was not explained in many cases. Diagrams do not make the answer more easily understood by the Examiner unless they are fully explained or labels are sufficiently detailed.

(c) Many answers simply stated that animals need water to drink and die without it! The question called for an explanation so that the uses of water by the animal – for chemical reactions in the body, for digestion, cooling, transport and, not least, for the production of milk or eggs, were all points looked for and seen in the best answers.

Question 11

(a)(i) Generally this question was well answered, with candidates giving a comprehensive list of advantages and disadvantages. Candidates should beware of simply stating "expensive" in questions of this type. The nature of the expense – high capital costs in buying the machine and running costs for fuel, maintenance and skilled labour – should be specified, so that it is clear that the candidate understands the problems.

(ii) Most candidates understood that a seed drill would spread seed more evenly and with less waste, reducing competition and enabling weeding etc. to be carried out more easily.

(b)(i) There were good accounts of the differences between petrol and diesel engines although, inevitably, some candidates confused the two.

(ii) Again, there were good accounts of safety precautions but candidates should ensure that those that they list are specifically related to storage of the substance mentioned in the question (in this case fuel for machinery) so that they do not simply list general precautions or those more appropriate to other farm chemicals.

Question 12

(a) Some candidates could describe pollination in only the most general terms and did not know the details in relation to a specific plant. It was clear that they were unaware that maize is wind pollinated. Features *not* present in a plant cannot really be described as adaptations, so reference to lack of coloured petals or scent did not gain marks. Candidates should concentrate on positive features such as structure and position of male and female flowers and quantity of fine, dusty pollen.

(b)(i) Candidates were able to give examples of a number of different methods of asexual reproduction in crop plants but some examples were incorrectly linked with a method or structure. Some candidates did not give examples but answered in rather general terms, mentioning tubers, for example, but not mentioning an appropriate crop.

(ii) Most candidates knew that the resulting plants would be identical to the parents and also mentioned that they would be quicker to mature than seedlings. Some candidates, however, seemed to think that these methods would result in a greater variety of cultivars. None mentioned that some plants can only be produced by vegetative means.

Paper 5038/03

Practical

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 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.

The vast majority of Centres had no difficulty in providing the necessary apparatus or reagents.

Comments on specific questions

Question 1

(a) Most candidates were able to describe at least one difference between the upper and lower surface of the dicotyledonous leaf. The most able candidates were able to describe two differences, choosing from a range of observable characteristics. A significant minority of candidates attempted this question by use of recall, but stated characteristics that were not observable.

(b) Most candidates were able to perform the test on the monocotyledonous leaf correctly, but fewer performed the practical test accurately enough on the dicotyledonous leaf.

(c)(i) This question was answered particularly well. Candidates were able to make appropriate conclusions from their results.

(ii) This question was also answered well. Most candidates were able to link the presence of water to the presence of stomata.

(d) Most candidates were able to describe the weather conditions, under which the rate of water would be greatest.

Question 2

(a)(i) This question was answered well by the most able candidates, who were able to give concise and accurate responses on how they conducted the practical tests. A significant proportion of candidates described practical tests that were inappropriate, and occasionally, dangerous. There appears to be confusion regarding the term ‘do not allow to boil’ – many candidates have described practical tests that involved the boiling of reagents.

(ii) There is little appreciation of the concept of fair testing. Very few candidates were able to describe how they controlled any of the variables in their practical work.

(b) Many more candidates were able to identify AS3 as ammonium sulphate, but far fewer were able to describe two negative results for the tests on AS4.

(c)(i) This question was answered well by all but the weakest candidates. Most responses involved descriptions of run-off or percolation, but only the most able candidates described the importance of ammonium sulphate being soluble.

(ii) Nearly all candidates concentrated on methods of removing or neutralising the effect of a soluble fertiliser in a river. Only a minority appreciated that prevention, e.g. by using less fertiliser, would be a better strategy.

Question 3

(a) It was clear that some Centres had made considerable effort working with their candidates in the preparation of balance sheets. Invariably, such candidates scored very well on this question. However, it appears that a significant number of candidates had not prepared for this type of question.

(b) Only the most able candidates described suitable reasons which might affect the price of a product. Most candidates incorrectly linked the price of the eggs to the cost of inputs.