

AGRICULTURE

Paper 5038/11

Paper 1

Key Message

- It is essential that candidates read each question thoroughly so that they understand what is required in the answer.
- Correct but irrelevant information will not gain credit. Where a specified number of responses is required, candidates should restrict themselves to that number and not simply make a list of all the possible responses that they can think of. The Examiner will not select correct answers from a list, which may contain incorrect answers, since the candidate must satisfy the Examiner that they know the correct answer(s).
- Where data is given, candidates can assume that this is to be used in their answers. Random speculation is unlikely to be productive.

General Comments

Some candidates appeared unwilling to attempt questions in **Section A** that required application of knowledge, rather than just recall of information. Credit is not deducted for incorrect answers so candidates are advised to make an attempt to answer all questions, as no credit can be gained where no answer is given. Some questions require the development of a statement, with further explanation, to gain full credit (the number of marks available should give candidates some idea of how much detail is expected). Questions that ask a candidate to 'describe' or 'explain' are likely to fall into this category and candidates should be aware of this. This is particularly relevant in **Section B**.

Comments on Specific Questions

Section A

Question 1

(a)

- (i) The correct answers were: **A** – penis, **B** – testis. Most candidates answered this correctly.
- (ii) Production of sperm (or male gametes) or hormones (a correctly named example was accepted) were the answers looked for. 'Production of semen' was an answer given by some candidates but this is incorrect and was not accepted.

(b)

- (i) Most candidates appeared to understand what is meant by *artificial insemination* but many did not express this clearly. Points needed were that the semen is collected from the male and stored, to be deposited in the female at a chosen time, so no physical mating takes place. Good answers also mentioned the choice of male from which to collect, based on selection of specific qualities.
- (ii) Too many answers were simply 'it is cheaper'. This shows no understanding and needs some qualification to justify the award of credit. Indication of why it is an

advantage not to keep a bull on the farm, reference to choice of male for a specific trait, use of semen from overseas animals and herd improvement were all valid answers.

Question 2

- (a) Disappointingly, this was poorly answered, with little evidence of practical knowledge. The question specified that a seed bed was being prepared, so candidates should be able to suggest what the cultivations were for. *Digging* (primary cultivation) turns the soil to bury weeds and trash. *Forking* breaks large lumps of soil into finer particles and *raking* levels the seed bed and produces a fine tilth (both secondary cultivations).
- (b) Candidates generally understood that the contour drains would prevent run-off causing soil erosion.
- (c) Many candidates did not read the question carefully or consider the information given when attempting to answer. Too many candidates focused on the yellowing leaves and suggested mineral deficiencies in the soil while others suggested lack of water, when the question stated that the soil was waterlogged. This should have alerted them to the idea of lack of air in the soil, leading to problems with respiration in root cells and an inability, therefore, to absorb nutrients.

Question 3

- (a) The symbol shown in Fig. 3.1 indicates that a substance is toxic (poisonous). The meaning is precise – ‘dangerous’ or ‘hazardous’ were not acceptable as these terms could apply equally to substances which are dangerous for other reasons.
- (b) Most candidates were able to carry out the calculation correctly, and gave the correct units – this is essential. It is important that candidates follow the instruction to show their working. There were a few instances where the final answer was wrong but the method of calculation was correct, so credit could be gained for this.
- (c) Some candidates seemed to think that the harvesting interval is to allow the insecticide to kill all pests but many were aware that it is to allow the insecticide to break down and become harmless.
- (d) Most candidates realised that the insecticide could also kill beneficial pollinators, as well as pests but to gain all credit available some explanation was needed to indicate that pollination is needed for fertilisation and fertilisation is needed for fruit formation.
- (e) This was well answered. Reference was made to spray blowing onto the operator, other people or animals, onto other crops that might be damaged by it, into water sources that would be polluted by it and to the waste of spray and, therefore money. Only two reasons were required. There is nothing to be gained by giving a list as only the first two given will be marked – correct answers will not be selected from amongst incorrect ones and time is wasted by writing more than is needed.

Question 4

- (a)
 - (i) The correct answer, 8 (mm), was given by most candidates.
 - (ii) Again, the correct answer, 8 (mm), was given by most candidates.

- (iii) Most candidates understood the data so could state that the feed cost per 100 eggs (for the 8 mm particles) was higher than for the other feeds but needed to develop this a little further to gain full credit. They could have stated that the 8 mm particles showed the highest food intake and lowest egg production or could have used figures from the table to illustrate either point.
- (b) Again, interpretation of the graph was largely correct and candidates stated correctly that crumbs were the best choice as they were the cheapest type of feed and had no effect on egg production. Those candidates who did not gain credit ignored the data and speculated on reasons why any of the feed types might be best, generally making the wrong choice as it was not based on the information given.
- (c) Candidates seemed to have little idea about what is meant by 'research'. They could have seen, from the data given in the rest of the question, that trials and experiments can inform the farmer of best methods, techniques and practices, improving productivity and economic performance. The knock-on effect is then to improve land use and food security. The stand-by answer of 'it saves money' did not gain credit without further explanation.

Question 5

- (a)
- (i) Inevitably, a minority of candidates confused stigma and anther but most gave correct functions for the two structures.
- (ii) Candidates used the diagram effectively to explain the structural adaptations of the stigma and anther, explaining how the feathery stigma and the exposed anthers would facilitate wind pollination.
- (b) Some candidates did not use the information given, ignoring the fact that this crop is wind-pollinated and that the question was clearly related to this. They speculated about possible lack of water or minerals or failures in cultivation methods. There were however, many good answers where candidates appreciated that the arrangement of the plants in a block would give a greater chance of wind-blown pollen being trapped by the stigmas and, therefore, a better chance of developing full cobs.

Question 6

- (a)
- (i) Most candidates gave the correct answer, 2 (low humidity, high temperature and wind strength).
- (ii) Most candidates gave the correct answer, 4 (high humidity, low temperature and wind strength).
- (b) Although correct answers had been given in (a), explanations were disappointing, lacking sufficient detail to gain more than partial credit. Responses often gave no more than a repeat of information from the table which had provided the answers to (a)(i) and (ii). A good answer would have referred to concentration or water potential gradients in terms of water vapour, comparing air spaces inside the leaf with the air outside. This would then have enabled candidates to show how humidity, temperature and wind strength would affect the gradient and, consequently, water vapour lost in transpiration. Where an answer has four available marks, candidates should consider whether their answer gives sufficient information as a detailed explanation is clearly expected.

Question 7

- (a)
- (i) There was a lack of detail again in some answers but some candidates applied themselves to the question and made valid suggestions. They realised that the drip system would deliver water directly to the soil and therefore the roots with minimal wastage, whereas the watering can would spread water over the plants as a whole, with some falling on the leaves and being evaporated or even causing them to be scorched, as well as resulting in waste.
 - (ii) There were several valid suggestions for why the watering can might be chosen over the drip system, such as cost or availability of materials.
- (b) Although candidates sometimes struggled to express the idea, most seemed to understand that the watering can could contain a measured amount of water which would enable the correct dilution to be applied accurately.

Section B

Question 8

- (a) This should have been a straightforward question but the quality of answers was very varied, with some candidates showing very sketchy knowledge of the role of soil microorganisms. A number of candidates were unaware that this term relates to microscopic forms, not earthworms or soil insects. Candidates should have been able to give some account of the role of bacteria in the nitrogen cycle and could have used diagrams to illustrate this. Whilst the names of specific bacteria are not required, candidates should have general knowledge of nitrifying, de-nitrifying and nitrogen fixing types. Bacteria (or microscopic fungi) in other nutrient cycles could also be mentioned.
- (b) Again, a lack of accurate knowledge was apparent in many answers. Candidates should have been aware that the relevant bacteria are found in the rumen, that they break down the cellulose that forms a major constituent of the ruminant diet and which would otherwise be undigested and, therefore wasted, and that they have a role in forming proteins and synthesising vitamins.

Question 9

- (a) Some candidates did not understand the term *extensive grazing*, although it occurs in the syllabus. Good answers included reference to cost benefits as there would be less labour required, housing and fencing costs would be reduced and cattle would forage for food for themselves. Disadvantages identified related to lack of control of diet and mating plus the difficulties of checking health, providing security from theft or predators and preventing damage to crops.
- (b) Misunderstanding of terms in (a) had a knock-on effect in this section. Many candidates described *zero grazing*, which is a form of intensive production but not of *intensive grazing*, since grazing must involve animals feeding on living grass in pasture. A description of a form of controlled grazing (such as rotational grazing) usually using fences, was expected with the consequent advantages then being stated.
- (c) This was generally well answered, although some candidates forgot that their answers should have referred to grassland and seemed to stray into methods of land/soil improvement for crops. Use of fertilisers, irrigation and legumes were all frequently mentioned in good answers but fewer thought of ploughing and re-seeding with improved species or the use of lime to improve grassland. Control of grazing was mentioned and

many referred to the role of burning but this should be qualified as being controlled burning (in terms of frequency and season), if it is to be of benefit to the grassland.

Question 10

(a)

- (i) Many responses contained little detail. Comparisons of cost, availability and durability were stated without any qualification or explanation. For example, in terms of durability there could be reference to rotting of wood or the action of insects, which would not occur with concrete blocks. This might be offset by the lower cost and greater availability of wood locally and the requirements of the house in terms of the size and strength of the livestock to be housed.
- (ii) Similar considerations could be given here but candidates should try to give more specific reasons when considering the roof of the house. Again, cost related to local availability would be valid but needed to be considered in terms of harbouring of pests and vermin in thatch and the greater fire risk. Many candidates tried to explain the potential insulating benefits of thatch, in both hot and cold conditions, but expressed this badly with poor understanding of the terms *conductor* and *insulator*.
- (iii) Points previously made would be valid considerations but candidates cannot expect to gain credit in all three sections for answers that go no further in each than 'it is more costly' or 'it lasts longer'. An effort should be made to relate these statements to the particular part of the housing under consideration. The use of expensive concrete for the floor, for example could be justified in terms of ease and efficiency of cleaning, compared to an earth floor.

(b) Some candidates strayed from the point here, giving reasons for choosing a specific livestock project, rather than considerations needed in the construction of the livestock house. Factors such as orientation, prevailing wind direction, proximity to the farmer's dwelling and to water supplies were points, amongst others, that could have been mentioned and each needed a brief explanation of why it would be important.

Question 11

(a)

- (i) Many candidates gave a description of budding and grafting plant material. The graft material described was generally a bud grafted to a rootstock and this is not a stem cutting. Correct answers often used sweet potatoes as an example but frequently lacked detail such as length of stem used or planting details (ridges, angle of planting).
- (ii) 'Cost' tends to be a stock answer, given by many candidates to any question asking for advantages and disadvantages of some process. This question was no exception but it was not really relevant here. Both advantages and disadvantages tend to lead back to the fact that offspring are identical to each other and to the parent plant. This means that crop quality is uniform and has the desirable traits of the parent. Such plants may also be quicker to establish and yield than those from seed. However, undesirable traits are also kept as there is no variation, the stock may deteriorate over time and diseased material may be propagated.

(b) It was disappointing that few candidates made much use of examples to illustrate their answers. As the question referred specifically to weeds in crops, using coconut as an example of a water-dispersed 'weed' was not really a valid point. Water could, however, be a valid dispersal method, where run-off would carry small seeds into fields. A few candidates confused pollination with dispersal, some including both in their answers. The question did not specify seed dispersal alone so the spread of weeds from vegetative

material, often during cultivations where pieces of root or rhizome might be spread, could have been included. This was mentioned by only a few candidates.

Question 12

(a)

(i) There was a disappointing lack of examples used to illustrate answers, although the question specified that this was required. Candidates mentioned the slope of land and related this to run-off and erosion but could have explained how this would limit land use in terms of cultivation and accessibility.

(ii) Again, there was a lack of detail or use of examples. Rainfall and temperature, as limiting factors, needed more explanation, in terms of amount and seasonality of rain plus temperature range, relating them to the length of the growing season of a crop. Wind, humidity or other extreme conditions could also have been mentioned but still needed examples of how they can affect land use.

(b)

This was answered better than the previous parts of the question. Cost, inevitably, was almost universally mentioned but there were many other good points made. These included availability of materials and inputs, labour and skills, markets, roads and transport as well as local tastes, soil and pest status. Candidates showed a greater inclination to develop and explain points in their answers.

AGRICULTURE

Paper 5038/12

Paper 1

Key Messages

It is essential that candidates read each question thoroughly and understand what is required in the answer. Candidates are expected to use the data provided in text, by illustration or graphically to inform their answers and this is made clear in the question.

Where a specified number of responses is required, candidates should restrict themselves to that number. The Examiner will not select correct points from a list, which may contain incorrect answers, since the candidates must satisfy the Examiner unequivocally that they know the correct answer(s).

Some questions require the development of a statement with further explanation to gain full credit (the number of marks available should give candidates some idea of how much detail is expected). Questions that ask a candidate to 'describe' or 'explain' are likely to fall into this category and candidates should be aware of this. This is particularly relevant in **Section B**.

General Comments

Many candidates seemed unwilling to attempt questions in **Section A** that require application of knowledge, rather than just recall of information. Credit is not deducted for incorrect answers so candidates are advised to make an attempt to answer all questions; no credit can be gained where no answer is given.

There was also a tendency to ignore the data provided. Attempting to answer purely in terms of recall is likely to lead to irrelevant answers, which miss the point of the question.

Candidates may not have direct practical experience of some areas of agriculture covered in the syllabus, as these may not be common in the region in which they live. However, they should still be able to attempt questions on **all** areas of the syllabus, even if their knowledge of some topics is largely theoretical.

Several answers showed evidence that the questions had not been fully understood.

Comments on Specific Questions

Section A

Question 1

(a)

- (i) This was a straightforward question and candidates were told that this was the reproductive system of a female animal. It was surprising, therefore, that a substantial number of candidates identified male reproductive organs whilst others labelled structures as part of the digestive system.
- (ii) Many candidates were unable to indicate where fertilisation occurs (in the oviduct). Many marked the uterus and some the vagina.

(b)

- (i) *Lactation* has a precise meaning, which was not known by many candidates. It is the whole period of milk production, following the birth of young.

- (ii) More candidates knew that *colostrum* is the first milk secreted immediately after birth.
- (iii) Again, there was a lack of precise or detailed information. Many candidates stated that colostrum is important for disease resistance in the young but few referred to the antibodies it contains, which confer this immunity. Proteins and vitamins were mentioned but these could have been qualified, as colostrum is particularly rich in proteins and contains important vitamins that would otherwise be lacking.

Question 2

- (a)
 - (i) *Biological control* is the use of another organism to control a pest. Candidates sometimes struggled to express this idea but most seemed to understand the principle. Some used an example to illustrate and clarify the point they were making.
 - (ii) Most candidates used pollination as the example of a beneficial effect of insects and a few mentioned the production of honey – both good answers.
- (b)
 - (i) The question specified that methods of protection for the operator whilst spraying should refer to the drawing, so references to weather conditions or storage precautions were not relevant. The operator was clearly shown working in sandals and without hand or face protection so would benefit from wearing boots, gloves or a mask/respirator and goggles. Only two means of protection were asked for so a long list was of no advantage.
 - (ii) Again, answers should have concentrated on problems shown in the drawing. It is for the farmer or spray operator to make sure that his methods are safe, in relation to local conditions and cultural practices in the area, so suggestions about where and when food is prepared were not relevant. Many candidates realised that spraying in windy conditions would cause problems with spray drift and many also suggested that spraying in wet conditions would be likely to increase run-off and percolation into water courses. Harvesting intervals were mentioned by some, as was avoiding planting close to water sources. These were all good answers.

Question 3

Very few candidates seemed to have any knowledge of this area of the syllabus. Candidates are likely to be seriously handicapped if all areas of the syllabus have not been studied, even if some of them are not of local significance.

- (a) Very few candidates were able to define stocking rate correctly, although this is a term that occurs in the syllabus. This meant that they then struggled with other parts of the question. The correct definition is *the number of animals stocked per unit area* (LSU per hectare). Candidates who attempted to answer often confused the term with *carrying capacity*.
- (b)
 - (i) Overgrazing also seemed to be a term unfamiliar to many candidates, who then found it difficult to interpret the graphs. Some appeared to think that it described cattle over-feeding and becoming fat. There were some good answers where candidates were able to state that output on both graphs showed a rapid decline as overgrazing increased and that this would be because there was insufficient grass to maintain yield.
 - (ii) Again, poor understanding of terms meant that candidates could not interpret the graphs. There was no understanding of why the trend in output per animal would differ from that of output per hectare. Candidates had to realise that an individual animal has a maximum capacity, however much food is available, whereas increasing the number of animals per hectare would increase overall output steadily to the optimum stocking rate but once this was exceeded, there would be a decline in output.
- (c) This question was misread by many candidates, who gave methods of preventing overgrazing rather than reasons why it should be prevented. Good answers could have stated that overgrazing can lead to soil erosion (as ground becomes exposed), damage to the grass plants and invasion by weeds.

Question 4

- (a)
- (i) This was generally well answered although the identities of **A** and **B** were confused by some candidates.
 - (ii) Most candidates knew that the xylem transports water and minerals.
- (b)
- (i) The required answer was *osmosis*, stated correctly by many candidates.
 - (ii) Candidates often did not make the connection between osmosis and what would happen in the situation described. Too many answers simply suggested that the inorganic fertiliser would “burn the roots”. Others speculated on rainfall and watering regimes, for which there was no evidence. The question stated that the fertiliser was a salt solution, which should have given the clue to the answer expected. Where candidates recognised that water would be drawn from the root cells by osmosis, explanations were frequently not clear. Candidates referred to “concentrations of water”, instead of solute concentration or water potential. It appeared that the basic understanding was there but candidates’ inability to use appropriate terms meant that answers were confused.
- (c) Prevention of erosion is not a function of roots, although it may result from their structure. Functions are uptake of minerals, anchorage and food storage, asexual reproduction or nitrogen fixation in some cases. All these points were seen in answers but some candidates did not note that the question asked for functions other than water uptake.

Question 5

- (a)
- (i) Many candidates ignored the information given and attempted to speculate on costs, availability and possible skills needed. It was hoped that candidates would realise that a compact cultivator might be more appropriate on small areas, as it would be more manoeuvrable. Few candidates suggested this. An equally small number picked up the lower likelihood of it overturning on slopes, compared to a tractor but many made the valid point that its use would be less likely to result in soil compaction than other implements.
 - (ii) Most candidates realised that the cultivator could have insufficient power for such conditions or that it might be damaged by them.
- (b) There was evidence that many candidates did not read the question carefully. The question asked for precautions taken in storing fuel such as petrol, not in its use. Some candidates gave conditions for storage of farm chemicals generally, rather than the specific requirements for fuels such as petrol. A significant number thought that the question referred to storage or maintenance of machinery. Good responses seen included, for example, cool and dry storage, away from sources of fire, in well-sealed container and a secure store.

Question 6

- (a) This was a simple genetics problem and many candidates answered well. The genotype of the yellow-fruited plant was **Yy**. Candidates also needed to provide a genetic diagram to show that this would produce the stated ratio when crossed with a white-fruited plant, **yy**. This could be a ‘web’ style diagram or a punnet square, as shown here.

| | | |
|---|----|----|
| | Y | y |
| y | Yy | yy |
| y | Yy | yy |

- (b)
- (i) There were many candidates who did not appear to understand that taking cuttings is a means of asexual reproduction where all the offspring are identical to the parent. Hence the genotype, in the example given, would always be **Tt**.

- (ii) 'Cost' was the fall-back answer of too many candidates. There was no reason to suppose that the cost would be lower than using seed so this answer gained no credit. A number of good reasons were suggested, such as the uniformity of the plants or the crop produced, the more rapid and reliable maturation of plants from cuttings rather than seed and the fact that some plants may not produce viable seed, so must be propagated asexually.

Question 7

- (a) In each case, reference to the content of the fertiliser was essential for credit to be awarded. There were many good answers with candidates gaining full credit.
- (b) When a question begins "Suggest....", candidates are expected to use their knowledge to propose reasons for an action. Many candidates gained credit for suggesting that a roof would protect the manure from rain and sun but rather fewer developed this, to suggest that this would then prevent loss of nutrients, particularly by leaching. This development of the idea was needed for further credit to be gained.

Section B

Question 8

- (a)
- (i) This was generally well answered, with a correct definition which was clarified by examples and illustrations. A few candidates confused *crop rotation* with *rotational grazing*. Some descriptions seemed to be of *shifting cultivation*, rather than crop rotation.
- (ii) There was a good range of benefits stated, although some answers could have expanded points to make them clearer. For example, prevention of mineral depletion could be related to differing nutrient requirements of crops in a rotation and their different rooting depths, also helping to avoid the formation of soil pans. Breaking pest and disease cycles could be explained beyond the bare statement by lack of a host when a new crop is grown.
- (b)
- (i) Most candidates understood that *mixed farming* is growing crops and keeping livestock on a farm.
- (ii) Again, benefits were well understood, with the use of animal manure as fertiliser and crop remains or surpluses as animal feed reducing the cost of inputs. Reduced risk of financial failure and greater self-sufficiency were also common valid points.

Question 9

- (a) The question specified site selection for livestock housing so financial considerations, such as capital or cost of materials, were, for the most part, irrelevant but this formed a large part of some answers. Some candidates concentrated on the choice of livestock to be kept, again concentrating on costs and markets but these factors did not address the question. There were also descriptions of features that should be included in the building but again, this was not what the question asked for. It was expected that candidates would consider topography, orientation of the building, prevailing wind direction, proximity to the farmhouse, availability of services such as water and accessibility. Each point needed some explanation of its importance in choosing the site.
- (b) The question asked for materials, not tools, which could be used for construction. Many candidates listed tools. This was another example of candidates not reading the question carefully, to ensure that their answers were relevant. It was expected that materials for different parts of the structure would be suggested, and the choice explained in terms of cost, availability, durability, insulation, ease of cleaning and potential pest problems. For example, thatch could be considered for the roof because it may be cheap and readily available as well as being a good insulator. Concrete might be chosen for a floor because, although it is relatively expensive, it is long-lasting and easy to clean. In this section, choices could be influenced by the type of livestock housed, so reference to this would be valid. Some candidates listed materials but gave no indication of where they would be used in the housing.

Question 10

- (a)
- (i) Most candidates remembered to state the name of the crop they had chosen. This was essential if the rest of their answers were to make sense.
 - (ii) The timing stated should have related to the length of growing period of the chosen crop and the temperature range and rainfall patterns in the season named, linked to the crop's requirements. Candidates showed little detailed knowledge of the crops they had chosen. Where rainfall and temperature were mentioned, no further detail was given. Too many answers were along the lines of, "This crop needs warm temperatures and a lot of water." This is insufficient as it shows no real knowledge of the subject.
 - (iii) Candidates continue to confuse the term *cultivar* with a cultivator. *Cultivar* is a term used in the syllabus and should be known and understood by candidates. It derives from 'cultivated variety'. A cultivator was mentioned in **Question 5** so candidates should have been aware of the difference. This is another example of careful reading of a question being needed.
- (b)
- (i) This was well answered in most cases. Candidates understood that weeds would compete for water and minerals, as well as preventing light getting to crop leaves and hampering root development. Other good points seen were harbouring of pests and diseases, crop contamination and reduced yield and difficulties that could be caused in harvesting.
 - (ii) Again, methods of weed control were well known, with hand-weeding, hoeing and other cultivations being valid answers. Candidates should use the term *herbicide* for chemicals which kill weeds. 'Pesticide' is not correct as this implies an insecticide or similar, which is clearly wrong in this context. Named examples were accepted but candidates must be sure that the chemical they name is correct for the purpose. Some named examples were fungicides or insecticides. There were answers giving good details of use, such as timing of application or whether the chemical was selective or non-selective.

Question 11

- (a) Answers were a little disappointing, lacking detail and accuracy in some cases. Good answers mentioned the effects of heating and cooling, coupled with expansion and contraction and many mentioned frost action. Candidates should be aware that running water and wind do not cause breakdown by themselves but by the action of the material that they carry, which abrades the rocks. Most candidates referred to the effects of acid rain but very few mentioned oxidation of minerals in rocks. The actions of animals and plants were frequently mentioned but answers were somewhat sketchy about how breakdown was brought about by these agents.
- (b) Some candidates were confused by the term mineral particles, which they appeared to understand as mineral salts. Most, however, realised that this referred to the soil particles that had come from rock breakdown. Answers should have been based on the idea that sand particles are the largest and clay particles the smallest so that properties could then be related to these facts and to the proportions of each type of particle in a soil. A few candidates showed impressive knowledge and were able to quote accurate particle sizes. Some candidates laid out their answers in columns, as comparisons of the two extremes, in terms of workability, warming, drainage and aeration and also compared the extremes to a loam. This was a good way of making an answer clear, although candidates should try to put such comparisons into sentences, as a list of words may not give sufficient detail for full credit to be awarded.

Question 12

- (a) This question was generally well answered. Candidates were able to give a good account of the signs that would be looked for in determining whether or not livestock are healthy. "Wet nose" is not a very good description as this might vary according to type of livestock but an abnormal discharge from the nostrils (or from the ears) would be a valid point. "Colour of eyes" is also a little vague. "Dull eyes" would be a better sign of a sick animal. Appetite, behaviour, change in yield, condition of coat or feathers and of urine or dung were all good points, amongst others, made by many candidates.

- (b) Again, there were many good answers. When mentioning vaccination, candidates should make it clear that this is a means of disease prevention by conferring immunity, rather than a means of treating a sick animal. There seemed to be some confusion over this by some candidates, perhaps muddling this with the use of antibiotics. Cleanliness of housing and the use of disinfectants were generally mentioned, as were the importance of clean food and water and the importance of a balanced diet. Most candidates gave some details of quarantine and isolation of sick animals and a few understood the importance of avoiding contact with wild animals, which might carry pathogens. Many suggested dipping to control ticks but did not develop this point by stating that this would avoid tick-borne disease. Some candidates suggested treatment to prevent and control a specific disease, often mastitis. This is good use of detailed knowledge but other, more general points would also be needed to gain the full credit available.

AGRICULTURE

Paper 5038/31

Practical

Key Messages

- Centres are reminded that soil indicator produces much more accurate results than universal indicator and questions on soil pH are written assuming soil indicator has been used.
- Food tests need to be well understood, including Benedict's test.
- Candidates should state clearly how their conclusions follow from their results.

General Comments

As in previous papers almost all candidates completed the paper making a positive attempt to answer all questions. In some Centres it appeared that the samples may have become contaminated or were incorrectly labelled. Where Centres completed the Supervisor's report the mark scheme was adjusted to accommodate the answers as provided on the Supervisor's report. It would appear that many Centres are using universal indicator, rather than soil indicator, to test for soil pH.

Question 1

- (a) Most candidates produced good quality, clear diagrams, with many candidates demonstrating excellent artistic skills; however candidates who produced clear if inartistic diagrams were not discriminated against. Candidates should be reminded that where diagrams are used, labels need to be specific with a single line drawn from the point required. Most candidates were able to give an indication as to scale and where appropriate these were credited.
- (b)
- (i) Most candidates were able to suggest how the plant chosen was adapted for dry conditions and able to survive in heavily grazed pasture, although few gave as an answer "rosette leaf pattern with leaves being close to the soil".
- (ii) Not all candidates were able to say how plants reproduce asexually other than in a very generalised way. Candidates should try to focus on an example e.g. adventitious shoots from nodes

Question 2

- (a) The Benedict's test would appear to be the least well understood of the three food tests given. Biuret test for protein appeared to be well understood. Candidates need to take care to link the conclusions to results when answering this style of question.
- (b) Most candidates were able to correctly answer this question and make an explanation linking the presence of nutrients and the need for protein.

Question 3

- (a) This question was well answered.
- (b) This question was generally well answered although an amazing number of candidates confused colour of the solution and pH of the sample. Some candidates did not allow sufficient time for their solution to settle, resulting in brown colour quoted as a result.
- (c) Almost all candidates were able to suggest appropriate methods to raise the pH of a soil.

AGRICULTURE

Paper 5038/32

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As in previous papers almost all candidates completed the paper making a positive attempt to answer all questions. In some Centres it appeared that the samples may have become contaminated or were incorrectly labelled. Where Centres completed the Supervisor's report the mark scheme was adjusted to accommodate the answers as provided on the Supervisor's report. It would appear that many Centres are using universal indicator, rather than soil indicator, to test for soil pH.

Question 1

- (a) Most candidates produced good quality, clear diagrams, with many candidates demonstrating excellent artistic skills; however candidates who produced clear if inartistic diagrams were not discriminated against. Candidates should be reminded that where diagrams are used, labels need to be specific with a single line drawn from the point required. Most candidates were able to give an indication as to scale and where appropriate these were credited.
- (b)
- (i) Most candidates were able to suggest how the plant chosen was adapted for dry conditions and able to survive in heavily grazed pasture, although few gave as an answer "rosette leaf pattern with leaves being close to the soil".
- (ii) Not all candidates were able to say how plants reproduce asexually other than in a very generalised way. Candidates should try to focus on an example e.g. adventitious shoots from nodes

Question 2

- (a) The Benedict's test would appear to be the least well understood of the three food tests given. Biuret test for protein appeared to be well understood. Candidates need to take care to link the conclusions to results when answering this style of question.
- (b) Most candidates were able to correctly answer this question and make an explanation linking the presence of nutrients and the need for protein.

Question 3

- (a) This question was well answered.
- (b) This question was generally well answered although an amazing number of candidates confused colour of the solution and pH of the sample. Some candidates did not allow sufficient time for their solution to settle, resulting in brown colour quoted as a result.
- (c) Almost all candidates were able to suggest appropriate methods to raise the pH of a soil.