



Rewarding Learning

**General Certificate of Secondary Education
2023**

Agriculture and Land Use

Unit 1
Soils, Crops and Habitats

[GAU11]

THURSDAY 1 JUNE, AFTERNOON

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

			AVAILABLE MARKS
1	<p>(a) Cocksfoot, Chickweed, Nettle, White clover; [1] for each correct answer</p> <p>(b) (i) a non-living (factor);</p> <p>(ii) Any two from: Light/water/minerals/space; (needs to be an abiotic factor they compete for)</p>	<p>[4]</p> <p>[1]</p> <p>[2]</p>	7
2	<p>(a) (i) A – stigma B – anther</p> <p>(ii) attract insects;</p> <p>(b) Any three from: small petals; petals not coloured; anther outside flower/long filaments; stigma outside flower/feathery; smooth/light pollen/large amounts of pollen; no nectaries; no scent allow converse but must state insect pollinated in answer</p> <p>(c) pollen tube; nucleus; ovary; seed;</p> <p>(d) (i) 247 000 – 223 000; $24\,000 \div 223\,000 \times 100$; 10.76; 10.8 (correct answer gets full marks)</p> <p>(ii) Not using pesticides/more organic farming/more mixed farming/ creating habitats/planting wild flowers/leave field margins</p>	<p>[2]</p> <p>[1]</p> <p>[3]</p> <p>[4]</p> <p>[4]</p> <p>[1]</p>	15
3	<p>(a) Percentages of each nutrient (allow Relative proportions/ratio of NPK)</p> <p>(b) Nitrogen/N;</p> <p>(c) crop scientist/agronomist/farm advisor;</p> <p>(d) (i) 6 (Allow between 4–6.5);</p> <p>(ii) lime;</p> <p>(e) (i) first mark: aeration leads to more oxygen/aerobic conditions</p> <p>any three from: more nitrogen fixation/nitrogen fixing bacteria; more nitrification/ nitrifying bacteria; less denitrification/denitrifying bacteria; more nitrates; more protein/amino acids</p> <p>(ii) ploughing/subsoiling/drain ground</p>	<p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[4]</p> <p>[1]</p>	10

			AVAILABLE MARKS	
4	(a)	oxygen	[1]	6
	(b)	(i) All points plotted correctly [2] 1 error [1]; Line joined between points [1]	[3]	
		(ii) As distance from the lamp increases the number of bubbles of gas decreases; less light for photosynthesis;	[2]	
5	(a)	(i) hydroponics;	[1]	7
		(ii) lettuce;	[1]	
	(b)	(i) glasshouse/plastic mulch;	[1]	
		(ii) Advantages Any two from: more yield; longer growing season; more heat; can control environment; greater range of crops; more efficient use of space; harvesting does not depend on weather;	[2]	
		Disadvantages Any two from: less natural pollinators; set-up cost; maintenance costs; more labour/management needed; need to irrigate; disease spreads rapidly/pests can build up	[2]	

- 6 Healthy crop:** soil tested; slurry/manure/fertiliser spread; fencing off; weed/pest control; ensure no residues left on grass,
Harvesting: mow when yield is high; but before majority of grass has shot/seeded; when weather is dry; cut grass in the afternoon or evenings; grass teded/kicked out/grass wilted; forage harvester/wagon/baler
Preservation: additives; grass compacted; polythene cover; anaerobic conditions/fermentation; vermin control

Band	Response	Mark
3	Candidates demonstrate a detailed and comprehensive knowledge and understanding of the process of growing and harvesting grass and in the making of silage. Candidates must accurately discuss at least two ways to grow a healthy crop, at least two ways to harvest the crop, at least two ways to preserve the crop plus one other marking point to get into band 3. Quality of written communication is excellent. Relevant material is organised with a high degree of clarity and coherence. Presentation, spelling, punctuation and grammar are of a high standard with appropriate use being made of specialist vocabulary.	[7]–[9]
2	Candidates demonstrate a detailed knowledge and understanding of the process of growing and harvesting grass and in the making of silage. Candidates must accurately discuss at least one way to grow a healthy crop, at least one way to harvest the crop, at least one way to preserve the crop plus one other marking point to get into band 2. Quality of written communication is good. Relevant material is organised with a high degree of clarity and coherence. Presentation, spelling, punctuation and grammar are of a reasonable standard with appropriate use being made of specialist vocabulary.	[4]–[6]
1	Candidates make general statements linked to the process of silage making. Quality of written communication is basic. The organisation of material may lack clarity and coherence. Presentation, spelling, punctuation and grammar are at a basic level with little use of appropriate specialist vocabulary.	[1]–[3]
0	No creditable comments	[0]

[9]

AVAILABLE
MARKS

9

		AVAILABLE MARKS
7	<p>(a) Any four from: filter paper in filter funnel; place soil in filter funnel; add water to funnel; record time/record volume of water; for set volume of water to drain/in a set time; repeat and find average</p> <p>(b) Any two from: Sticky/warms slowly/few air spaces/holds more nutrients/hard when dry</p> <p>(c) A</p>	<p>[4]</p> <p>[2]</p> <p>[1]</p> <p>7</p>
8	<p>(a) An animal or plant identified as being a conservation concern/ endangered/protected species [1]</p> <p>(b) Yellowhammer/Irish hare/Red squirrel/Lapwing/Curlew/Barn owl</p> <p>(c) damp meadows/damp grasslands/wetlands</p> <p>(d) Any two from: Increases population; protects habitats; promotes biodiversity; habitat creation; promotes environmentally friendly farming practices/specific example; improved data collection/monitoring</p>	<p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[2]</p> <p>5</p>

9 Biomass crop: Willow/elephant grass/grass (silage)/maize; oilseed rape (essential for mark band 3)

Advantages: Carbon neutral; renewable; reduces reliance on fossil fuels; provides income; provides local employment; can be part of crop rotation; can grow in our climate/ grow on marginal land;

Disadvantages: less land available to provide food; increases rent and land prices; expensive machinery/ contractor costs; slow return on investment;

Environmental impacts: Can create habitats; can increase biodiversity; can help reduce climate change/global warming; wild land converted to farm land;

Band	Response	Mark
3	Candidates give a suitable biomass crop. Candidates must accurately discuss at least three advantages, at least two disadvantages and at least one environmental impact for their chosen crop. Quality of written communication is excellent. Relevant material is organised with a high degree of clarity and coherence. Presentation, spelling, punctuation and grammar are of a high standard with appropriate use being made of specialist vocabulary.	[7]–[9]
2	Candidates must accurately discuss at least two advantages, at least one disadvantage and at least one other marking point about their chosen crop. Quality of written communication is good. Relevant material is organised with some clarity and coherence. Presentation, spelling, punctuation and grammar are of a reasonable standard to make meaning evident. There is some use of appropriate specialist vocabulary.	[4]–[6]
1	General statements about biomass crops. Quality of written communication is basic. The organisation of material may lack clarity and coherence. Presentation, spelling, punctuation and grammar are at a basic level with little use of appropriate specialist vocabulary.	[1]–[3]
0	No creditable comments	[0]

[9]

Total

AVAILABLE MARKS

9

75