

**Qualification: 0170-20-001/501 Level 2 Technical Award in Land based studies
- Theory exam**

June 2018

1	List the four factors required for Photosynthesis. (4 marks)		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for each, up to 4 marks <ul style="list-style-type: none"> • Light • Carbon dioxide • Water • Chlorophyll (will accept chloroplasts) 	Accept – Correct temperature	4
2	a) Describe two stages in the process of transpiration. (2 marks) b) Describe two factors that can affect the rate of transpiration. (4 marks)		
	Acceptable answer(s)	Guidance	Max mks
	a) one mark for each maximum 2 marks <ul style="list-style-type: none"> • Water evaporates from the leaves • As this water evaporates, water is drawn out from the stem • More water is taken up by the roots. b) any two from – max 4 marks <ul style="list-style-type: none"> • Light– In bright light transpiration increases (1 mark) as stomata open wider allowing carbon dioxide into leaf (1 mark) • Temperature– Transpiration is faster in higher temperatures (1 mark) as evaporation and diffusion rates increase (1 mark) • Wind– Transpiration is faster in windy conditions (1 mark) as water vapour is removed quickly by air movement (1 mark) • Humidity – Transpiration is slower in humid conditions (1 mark) as diffusion of water vapour out of the leaf 	Accept any other suitable answer	6

	slows down when air is already full of water vapour (1 mark)		
3	Explain why fertilisers should be applied at the right time. (6 marks)		
	Acceptable answer(s)	Guidance	Max mks
	2 marks per explanation, maximum 6 marks <ul style="list-style-type: none"> Fertiliser should be applied pre-planting (1) , ensuring there are correct nutrients for germination (1) Fertiliser should be applied post-planting (1) to encourage maximum growth (1) Fertiliser should not be applied in wet conditions/heavy rain (1) as nutrients will be lost (1) Fertiliser should not be applied in excessively dry conditions(1) as nutrients will be lost to the atmosphere and not available to plants(1) Applying fertiliser too early before planting (1) can result in nutrients being lost, so there are not enough available for the plant.(1) 	Accept any other suitable answer	6
4	Describe four potential impacts of an unbalanced diet on dairy cattle. (4 marks)		
	Acceptable answer(s)	Guidance	Max mks
	1 mark each, up to 4 marks <ul style="list-style-type: none"> The wrong diet can lead to a drop in milk yield If cattle are fed too little they will lose weight (malnutrition) If cattle are fed too much they will gain weight Cattle get deficiency disease when they are lack specific nutrients Cattle more susceptible to disease when diets are lacking in nutrients 	Accept any other suitable answer	4
5	State four signs/symptoms of myxomatosis in rabbits. (4 marks)		
	Acceptable answer(s)	Guidance	Max mks

	<p>1 mark each, up to 4 marks</p> <ul style="list-style-type: none"> • Swelling of the eyes • Swelling at the base of the ears • Swelling around the anal/genital area • Discharge from the eyes - conjunctivitis • Loss of appetite • Fever/high temperature • Dull coat • Death 	Accept any other suitable answer	4
6	State two uses of land in the UK. (2 marks)		
	Acceptable answer(s)	Guidance	Max mks
	<p>Any 2 from the following up to 2 marks</p> <ul style="list-style-type: none"> • Farming • Infrastructure (roads, quarries, water) • Energy production (wind turbines, solar power, hydropower, Electricity plants) • Forestry • Leisure (field and adventure sports) • Housing 		

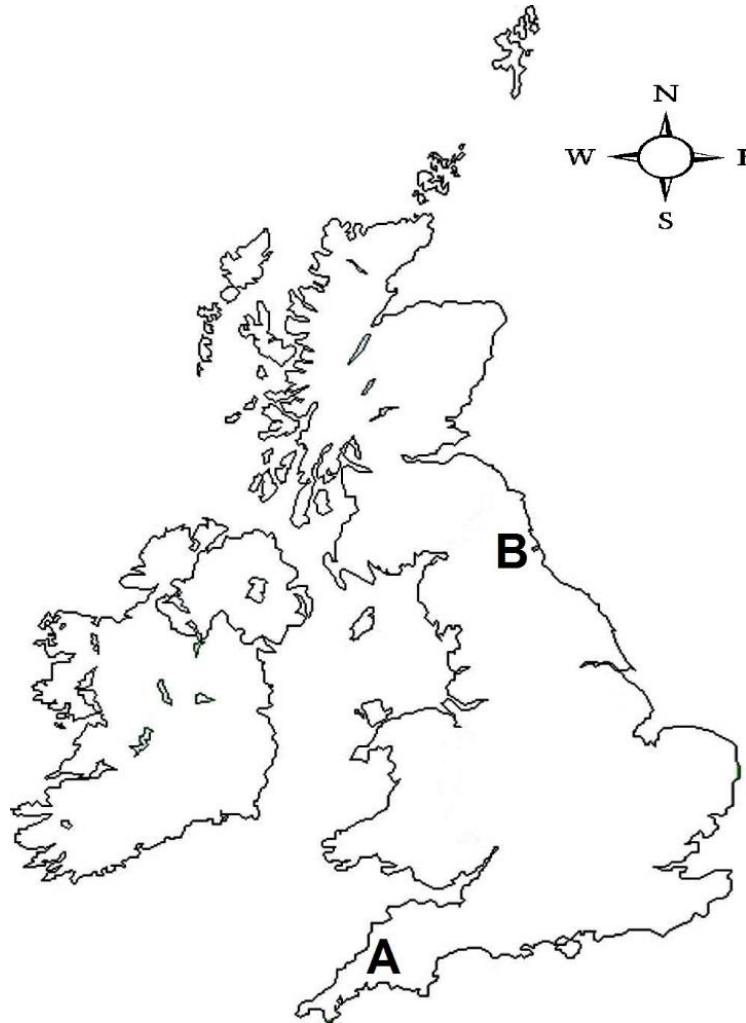


Figure 1

Describe **three** ways that climate influences land use at A and B in Figure 1. (6 marks)

Acceptable answer(s)

Guidance

**Max
mks**

2 mark per description up to 6 marks

- A has higher annual rainfall than B (1 mark), therefore different agricultural practices (A – market gardening and livestock, B has more arable farming) (1 mark)
- A and B may be more suitable for wind farms (1 mark) – as they are both near the coast (electricity production) (1 mark)
- A has more daylight hours than B (1 mark) and may be more suitable for solar powered energy (1 mark), greater plant growth due to longer day light at A (1 mark)
- A has a higher average annual temperature (1 mark) than B which is more suitable to horticultural production. (1 mark)

Accept any other suitable answer

6

8	Describe three potential challenges and conflicts that can be caused by leisure activities in the countryside. (6 marks)		
	Acceptable answer(s)	Guidance	Max mks
	<p>2 marks per description up to 6 marks</p> <ul style="list-style-type: none"> • Leisure activities can lead to increased foot fall (1) which increases erosion (1) • Noise pollution caused by car/traffic and increase activity, (1) which affects local communities and wildlife (1) • Light pollution is caused when car headlights/lights on buildings/torches (1) interfere with dark skies and wildlife (1) • Impact on local communities (1) caused by visitors, traffic, litter etc (1) • Biodiversity (1)– people/cars/dogs can be involved in introducing/spreading invasive species(1) • Biosecurity (1)– people/cars/dogs can be involved in potential spreading of disease(1) 	Accept any other suitable answer	6
9	Explain how advances in science and the innovation of land-based machinery can benefit businesses. (4 marks)		
	Acceptable answer(s)	Guidance	Max mks
	<p>Any two from the following explanations, up to 2 marks</p> <ul style="list-style-type: none"> • Machinery is more efficient and helps business to increase production • New machinery can reduce cost of production and help business to increase competitiveness • Business will have increased sustainability due to de increased production and competitiveness • New machinery can allow more land to be utilised 	Accept any other relevant answer and specific examples	4
10	Describe two factors that a business will consider when purchasing a new tractor. (2 marks)		
	Acceptable answer(s)	Guidance	Max mks

	<p>Any 2 descriptions from the following, up to 2 marks</p> <ul style="list-style-type: none"> • Cost of the tractor, is it affordable? • Design of the tractor according to the nature of business (eg size, flexibility) • Are there any operational restrictions, such as training requirements, age restrictions etc 	Accept any other suitable answer	2
11	List four uses of Information Technology in land-based industries. (4 marks)		
	Acceptable answer(s)	Guidance	Max mks
	<p>Any 4 from the following, up to 4 marks</p> <ul style="list-style-type: none"> • Data storage • Climate control • Computer controlled hydroponics • Precision farming (RTK) • Robotic milking parlours • GPS • CCTV • Communication 	Accept any other suitable answer	4
12	<p>A local farmer is hoping to reclaim land that has been unworked for many years.</p> <p>The farmer is planning to use the land for intensive crop production. The site is next to a SSSI (Site of Special Scientific Interest) and bird watching lake and marsh.</p> <p>Discuss the potential challenges and conflicts that may arise and how farming practice and technology could be used to minimise any impact on the SSSI and bird watching. (12 marks)</p>		
	Acceptable answer(s)	Guidance	Max mks
	<p>Band 1: 1 – 4 marks Basic discussion with minimal range of challenges and conflicts. Limited reference to the impact on SSSI, lake, marsh and/or the bird watching. To access the higher marks in the band, the response will make an attempt to explain the significance of a SSSI and attempt to make suggestions of how the farmer can minimise impact of farming practice.</p> <p>Band 2: 5 – 8 marks An explanation of the significance of a SSSI is given and a range of challenges and conflicts discussed with clear links made to impact on the SSSI, lake, marsh and the bird watching. Some reference to actions which could minimise the impact of the farming practice. To access the higher marks in the band, the</p>	<p>Indicative content: Explanation of the significance of a SSSI</p> <p>Challenges and conflicts:</p> <ul style="list-style-type: none"> • Loss of habitat when the land is reclaimed • Noise pollution and farming activity will potentially affect the birds • Bird watchers and local residents may become upset and protest against the changes 	12

	<p>response will be balanced with recommendations or conclusions that are mostly supported.</p> <p>Band 3: 9 – 12 marks</p> <p>A very clear explanation of the significance of SSSI and potential challenges and conflicts and impact of the farming practice on the SSSI, lake, marsh, bird watching. A detailed description and comparison of an extensive range of challenges, demonstrating a sound understanding of implications for the whole area, including reasoned explanations of steps to minimise impact. To access the higher marks in the band, the response will be well balanced with recommendations made that are fully justified and conclusions that are fully supported.</p>	<ul style="list-style-type: none"> • Intensive farming may result in soil washing into the lake/silting up • Fertiliser may get into lake – eutrophication • The SSSI may be very sensitive and could be affected by chemicals used in the farming of the land • The farmer could be prosecuted if SSSI is affected. • Any other relevant content <p>Action to minimise impact:</p> <ul style="list-style-type: none"> • Leave a strip of land to keep activity away from SSSI and lake • Plant a treeline to minimise impact • Use ‘quiet machinery’ – less noise pollution • Precision fertiliser/chemical application to reduce risk of eutrophication • Use disease resistant crop varieties to reduce need for chemicals • Do not farm the land • Any other relevant content <p><i>For no awardable content, award 0 marks.</i></p>	
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