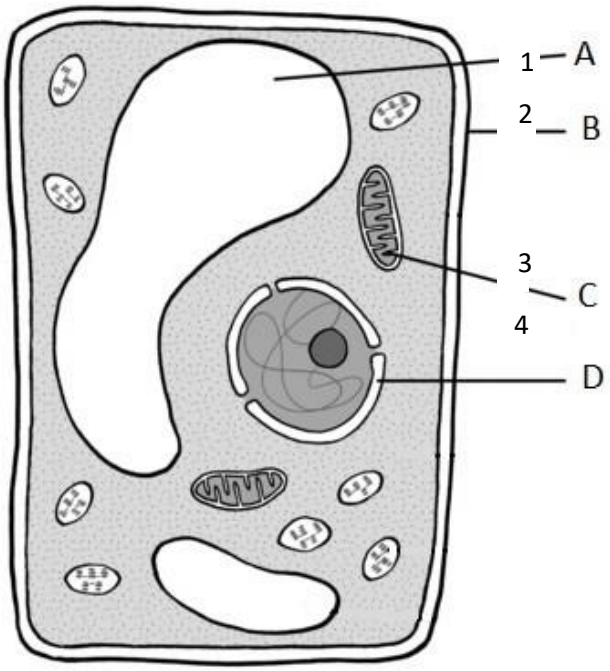
0170-501 March 2022

Level 2 Technical Award in Land-based Studies

Level 2 Land Based Studies – Theory exam (1)

Q	Acceptable answer(s)	Guidance	Max marks
1	List **four** crop harvesting machines. (4 marks) **Answer** • Combine Harvester • Root crop Harvester • Forage Harvester • Potato Harvester • Whole tree Harvester • Sugar beet harvester • Baler • Chainsaw	**1 mark for each** Accept any other relevant answer **Do not accept:** Rakes, Haybob and mowers are not acceptable answers as they are not harvesting machines	**4**
2	Identify **four** different mammals or birds that are considered pests, which can cause plant damage. (4 marks) **Answer** • Rabbits • Deer • Badgers • Pigeons • Corvids (rooks, crows)	**1 mark each** Accept any other relevant answer **Do not accept a list of named birds**	**4**

3	For **each** of the following factors, explain how they can affect food production. a) Temperature. (2 marks) b) Altitude. (2 marks) c) Low rainfall. (2 marks) d) Soil. (2 marks) **Answer** a) **Temperature** - Most plants cannot grow if the temperature too cold/too hot (1) as a consequence some areas are unsuitable for crop cultivation/can affect the choice of crop to grow (1) b) **Altitude -** This affects different types of farming (1) as different crops will grow best at different heights (1) If temperatures are consistently high with rainfall (1) then high yield crops can be grown. (1) The higher up (1) the less soil there is (1) c) **Low rainfall-** Water is a key factor in plant growth (1) therefore less water means low yields (1) The greater the average temperature (1) the greater the amount of water required for plant growth. (1) Seasonal variation is important (1) as different crops require water at different times.(1) d) **Soil**- Soil type will influence crop cultivation (1) because different crops prefer different soil (1) Different soils have different pH (1) which can affect plant growth (1) Different soils retain different nutrients (1) which can affect yield and quality (1) / lock up trace elements (1)	**Up to 2 marks each, to maximum of 8 marks** Accept any other relevant answer	**8**

4	For **each** of the following act of parliament, describe **two** ways that they have helped to shape the countryside. a) Agriculture Act. (2 marks) b) Countryside and Rights of Way Act. (2 marks) **Answer** a) Increased farming productivity (1) Increased security for farming (1) Introduced guaranteed prices (1) b) Increased public access for recreation and leisure activities (1) Landowners must maintain public access routes (1)	**1 mark each, up to 4 marks** Accept any other relevant answer	**4**
5	List **two** criteria for an area to be designated a Site of Special Scientific Interest (SSSI). (2 marks) **Answer** • Rare plants • Rare animals • Geology • Geography • Special features	**1 mark each, up to 2 marks** Accept any other relevant answer including specific features e.g specific plants and animals	**2**
6	 **Figure 1**	**a) 1 mark each, up to 4 marks** **b) 1 mark each, up to 4 marks** Accept any other relevant answer	**8**

a) Identify the parts labelled A-D in plant cell shown in Figure 1. (4 marks)

b) Describe **one** function of **each** of the parts identified in Figure 1. (4 marks)

Answer

a)
A- Vacuole
B- Cell wall
C- Mitochondria
D- Nucleus

b)
A. Vacuole
- To contain water for cells
- To contain enzymes
- To isolate harmful material
- To store waste products
- To help maintain pressure in cells

B. Cell wall
- Protects organelles inside cell
- Semi-permeable
- Gives strength
- Gives structure

C. Mitochondria
- Produce energy for the cell
- Regulate cell metabolism
- Perform cellular respiration

D. Nucleus
- Stores the plants DNA
- Co-ordinates cell's activities
- To assist in reproduction (cell division)

7	Describe **two** factors that affect the rate of transpiration. (4 marks) **Answer** When **stomata** are open (1) transpiration rates increase (1) When **stomata** are closed (1) transpiration rates decrease (1) Warmer air/**humidity** holds more water (1) increasing the rate of transpiration (1) **Windy conditions** (1) increase the rate of transpiration (1) **Increased light** levels cause the stomata to open (1) increasing transpiration (1) As **temperature** increases (1) so does transpiration (1)	**Up to 2 marks each, to maximum of 4 marks** Accept any other relevant answer	**4**
8	Describe the texture of **four** different soil types. (4 marks) **Answer** **Clay –** feels sticky (1) / keeps its shape when wet and dry (1) **Sand –** feels gritty (1)/ crumbles easily (1) **Loam –** feels soft (1)/ crumbly(1) **Silt –** feels smooth(1) / keeps its shape when wet(1)/ feels sticky when wet (1)	**1 mark each, up to 4 marks** Accept any other relevant answer	**4**
9	Describe **four** reasons for good nutrition in animals. (4 marks) **Answer** • As the animal takes in food it has the energy to increase its size (grow) (1) • The food taken in helps to maintain the immune system and so prevent disease (1) • Food allows the body to mature so that it can pass on its genes (reproduce) (1) • Energy allows the animal to find the best sources of food and avoid predators (1) • Good nutrition aids in good production e.g milk, meat, wool (1) • Good nutrition aids improved movement (1)	**1 mark each, up to 4 marks** Accept any other relevant answer	**4**

10	Describe **six** ways in which technology has improved animal health and welfare. (6 marks) **Answer** • Building climate control allows the ideal temperature and humidity for animals to be achieved in buildings (1) • Ultrasound pregnancy testing equipment allows pregnancy diagnosis to be carried out non-invasively and earlier than before (1). • Pedometers allow activity to be detected in animals e.g. cows on heat (1) • Thermographic imagery allows injuries to be detected non-invasively (1) • Hydrotherapy is useful in physio for horses (1) • Medical and veterinary advances help in improving the welfare of animals / help to diagnose and treat illnesses earlier (1) • Semen preservation allows genetic traits that are wanted to be used (1)	**1 mark each, up to 6 marks** Accept any other relevant answer	**6**
11	Discuss the challenges and possible solutions from feeding an increasing UK population. (12 marks) **Band 1 (1-4 marks)** Limited discussion of the challenges and solutions from feeding an increasing UK population. There will be limited examples. Answer may be disorganised and ambiguous. **Band 2 (5-8 marks)** Adequate discussion of the challenges and solutions from feeding an increasing UK population. There will be adequate examples. There will be some use of specialist terms, although they may not always be used appropriately. The information is presented mostly in a structured format. **Band 3 (9-12 marks)** Detailed discussion of the challenges and solutions from feeding an increasing UK population. There will be detailed examples. Specialist terms will be used correctly and appropriately. Information will be presented in a structured format and logical order.	**Indicative content** • Geography • Weather • Topography • Climate • Technical skills • Intensive farming • GM • Economies of scale • Local and global markets • Subsidies • Technology • Biosecurity • Eutrophication • Increased rural activities • Increased nutrient use • Technology • Scientific principles • Loss of biodiversity • Need for cheaper food • Lower use/banning of chemicals • Changing eating habits • Political change • Reduction of waste • More novel crops • City farms and gardens	**12**