



**Qualification title: 0170 Level 2 Technical Award in Land-based Studies**

**Test title: 0170-501/001 Level 2 Land based studies- Theory exam**

**Version: June 2017**

**Exam date: 28/06/2017**

**Exam Time: 13:30-15:00**

**Base mark: 80**

**1**

- a) Identify **two** different industry clusters which form a part of the UK's land management and production industry. (2 marks)
- b) Describe **three** relevant technical skills required for working within the Land Based Industry. (3 marks)

**Answer:**

- a) Two from: (maximum of 2 marks)
- agriculture
  - horticulture
  - forestry
  - arboriculture
  - floristry
  - fisheries
  - land based engineering
  - leisure
  - field and adventure sport
  - animal care
  - equine
  - farriery
  - game and wildlife management
  - environmental conservation
- b) Three descriptions from the following, maximum of 3 marks:
- practical experience
  - nationally recognised qualifications
  - personal management skills
  - communication skills
  - problem solving skills
  - good timekeeping
  - observant
  - good hazard perception

Accept any other suitable answers

**Total marks: 5 marks**

**2**

- a) Explain the purpose of the 2000 Countryside and Rights of Way Act. (2 marks)
  
- b) Describe **three** challenges for land owners and local communities which could arise from increased access. (6 marks)

**Answer:**

- a) 2 marks for: To allow the public increased access to the countryside for leisure purposes
  
- b) 2 marks for each description, for a maximum of 6 marks
  - damage to the environment (1) (noise/habitat)/erosion to footpaths (1)
  - increased traffic (1) (pollution, noise, erosion (1)
  - increased risk of fire, burglary and criminal damage to property(1) increase number of people visiting countryside(1)
  - injury and distress to farm livestock(1) People and dogs walking through field (1)
  - crop damage (1) dogs and people walking through field (1)
  - any other plausible challenge

**Total marks: 8 marks**

**3**

- a) Name the **three** major nutrients important for the growth and health of plants.(3 marks)
- b) State which major nutrient has the greatest influence on leaf development and yield. (1 mark)
- c) Name the process which uses light, water and carbon dioxide to provide growth of the plant. (1 mark)
- d) Describe a fertiliser programme that could be used to grow a high yielding cereal crop. (6 marks)

**Answer:**

- a) Nitrogen, Phosphate and Potassium (3 marks)
- b) Nitrogen (1 mark)
- c) Photosynthesis (1 mark)
- d) Application of:
  - NPK in late Feb or GS 25-30 (Max 2 marks)
  - N only April (first) or GS 31-32 (Max 2 marks)
  - N only May or GS 37-39 (Max 2 marks)

Application of fertilizer pre planting/sowing

Two applications of fertilizer during growth

Any other answers which are applicable.

Answer should identify three application stages within the range above.

**Total marks: 11 marks**

4

A successful dairy production unit on a farm is dependent on careful management of the diet of dairy cows and an understanding of how their digestive system works.

- a) State the type of digestive system of dairy cows. (1 mark)
- b) State **two** types of stored forage used for dairy cows. (2 marks)
- c) Explain how food is digested in cattle. (4 marks)

**Answers:**

- a) Ruminant digestive system (1 mark)
- b) Two from: (Max 2 marks)
  - forage maize
  - grass or maize silage
  - whole crop cereal silage
  - hay
  - straw
  - other sources of forage acceptable at discretion.
- c) Answers should incorporate 4 key areas of explanation and demonstrate understanding of how the ruminant system works:
  - ruminants have four stomach chambers (1)
  - cellulose/fibre broken down by microbes in Rumen (1)
  - microbes grow and multiply to form microbial protein within the reticulum and omasum (1)
  - microbial protein then digested in abomasum (1)
  - microbial protein then absorbed in small intestine thus becoming a source of protein for the animal (1)
  - accept any other suitable answer

**Total marks: 7 marks**

5

There are a range of land based businesses across the country which are linked to topography and climate.

Discuss how climate and geology have determined the differences in types of businesses that exist between the North West and the Eastern part of England. (12 marks)

**Answer:**

**Indicative content:**

- Climate: high rainfall and wind in the North West compared to drier eastern part of England influences crops grown and access to land. Latitude should be commented on in relation to climate and available sunlight, renewable energy sources, solar in East and wind in North West.
- Geology: Igneous rock formations causes a rugged and severe terrain and affects soil types and amount of available land for arable crop production in NW (as stock farming). It also affects the species of grasses used which also affects types of livestock grazing. The East is level lowland farming (cereals/arable). Impact on land use from basic agriculture to leisure pursuits.

**Band 1: 1-4 marks**

Basic discussion outlining at least one difference between the two regions. To access the higher marks in the band, the response should recognise an element from climate or geology plus an example of business type that is relevant.

**Band 2: 5-8 marks**

More developed discussion incorporating more than one difference relevant to reflect climate and geology but still limited on business examples to illustrate the discussion.

To access the higher marks in the band, the response should mention more than one business.

**Band 3: 9-12 marks**

Detailed discussion which covers a comprehensive range of factors related to climate, latitude and geology with a good range of examples of businesses across a range of clusters. 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.

**Total marks: 12 marks**

**6**

Regular health checks are essential in order for signs of poor health to be quickly picked up.

- a) Describe **three** visual signs that would indicate that an animal is sick. (3 marks)
- b) Describe how body temperature can differ between a healthy animal and a sick animal. (2 marks)
- c) Explain why it is important to monitor animal health. (3 marks)

**Answer:**

- a) Descriptions may include any three from:
  - abnormal behaviour or posture or movement
  - discharge of any type from either:
    - mouth
    - nose
    - eyes
    - ears

- dry coat
- skin swellings/discharge
- abnormal eating habits
- condition of urine and faeces
- abnormal weight loss or change or increase

Accept any other suitable answer

Maximum 3 Marks

- b) Healthy animal should show temperature in normal range (1)  
Unhealthy animal temperature below or above range(1)  
Maximum 2 marks

- c) Explanations may include any three from:
  - Animal welfare
  - To satisfy 5 freedoms (legislative requirements)
  - Keep animal productive
  - Reduce costs
  - Prevent spread of disease amongst its own kind and environment
  - Prevent disease transfer to humans (zoonoses)
  - Biosecurity
  - Reducing animal stress
  - Animal can be treated if unwell.

Maximum 3 marks

**Total 8 marks:**



- a) Identify the disease shown in the image above. (1 mark)  
 b) Describe **two** conditions which can lead to this disease occurring. (2 marks)  
 c) Describe **two** methods used to control this disease. (2 marks)

**Answers:**

- a) Mildew (1 mark)
- b) Two from:  
 Prevalent during dry summers  
 Poor air flow  
 High humidity  
 Growing against walls  
 Dry soil  
 Allowing to overwinter on untreated stems or dormant buds  
 Maximum 2 marks
- c) Two from:  
 Non chemical control:  
 - Water plants during dry spells  
 - Mulch soils  
 - Grow away from walls/corners in good air circulation  
 - Feed regularly (fertiliser)  
 - Prune out infected shoots  
 - Selection of resistant cultivar/types  
 Chemical control:  
 - Use of fungicide  
 Maximum 2 marks

**Total marks: 5 marks**

**8**

Modern Horticultural production methods make full use of technology to overcome many problems faced in the industry.

- a) Identify **two** examples of technology found in commercial greenhouses used in the control of pests and diseases. (2 marks)
- b) Describe how a Hydroponic system works. (3 marks)

**Answer:**

- a) Two from: (Max 2 marks)
  - Chemical control
  - Biological Control (example allowed)
  - Genetic development
- b) Basic system: (Max 3 marks)
  - Water circulated by pump from main nutrient tank to crop and returned to main tank (1)
  - Nutrients supplied from stock tanks (1)
  - Circulating solution monitored for temperature, pH and nutrients (1)

**Total marks: 5 marks**

**9**

Technology has several important roles to play within the land based industries.

- a) Identify **two** ways in which technology can assist businesses in their work. (2 marks)
- b) Purchasing new technological equipment can be expensive. Describe **three** factors that influence the selection of new equipment. (3 marks)
- c) Explain **two** reasons for operational restrictions on certain land based machinery. (2 marks)

**Answers:**

- a) Two from: (Max 2 marks)
  - Planning work
  - Providing motive power
  - Automation (reducing man power/speeding up work)
  - Application or handling of materials
  - Monitoring/Recording
  - Any other acceptable answer at discretion
- b) Descriptions of three factors from: (Max 3 marks)
  - Value for money
    - Cost
    - Type of business
    - Operating environment
  - Design:
    - Climate and weather
    - Geography
    - Topography
    - Geology
    - Operating environment
    - Nature of the business concerned
    - Flexibility of usage

c) Any two from (Max 2 marks)

- Age, skill level and training required by staff
- Health and Safety, operator certification
- Industry/insurance regulation restrictions on activity

**Total marks: 7 marks**

**10**

Modern animal production methods require careful management in order to maintain the health and welfare of farm animals. There is increased control over the care of livestock which helps to protect the industry and the public at large.

Discuss the role that animal welfare legislation, preventative care and biosecurity controls have on public health and the animal production industry. (12 marks)

**Answers:**

**Indicative content**

5 needs of the Animal Welfare Act 2006

Specifically relating to care and husbandry of animals

Examples for each need

Biosecurity controls – isolation, footbaths, quarantine periods, legislation on transporting of animals, restricting public access

Preventative care – vaccination, parasite control, hoof care, teeth care

Cleaning animal housing

Reference to public health/zoonoses

**Band 1: 1-4 marks**

Basic discussion outlining the role of one or both of welfare and biosecurity. No example given but basic understanding of health and productivity given. To access the higher marks in the band, the response will make relevant points and attempt to describe the five needs.

**Band 2: 5-8 marks**

A good level of discussion developed to include clear reference to productivity or health in line with welfare and biosecurity with some examples given. The answer should demonstrate a clear understanding of welfare, preventative care and biosecurity. To access the higher marks in the band, the response will be balanced with recommendations or conclusions that are mostly supported with a clear understanding of how to meet each of the five needs.

**Band 3: 9-12 marks**

An excellent level of discussion/explanation that demonstrates clear knowledge of welfare, preventative care, public health and biosecurity and their links to productivity and health. A number of examples given and are clearly integrated into the discussion. 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.

**Total marks: 12 marks**