



Qualification title: 0171 Level 3 Technicals in Agriculture
Test title: 0171-502/002 - Level 3 in Agriculture - theory exam
Version: June 2017
Exam Date: 19/06/2017 **Exam time: 09:00-10:30**
Base mark: 60

1. Describe **three** hazards and/or limitations of using tractors with implements attachments on hilly ground.

Answer:

1 mark each for any 3 of the following, maximum of 3 marks

- machine may tip over
- machine may not be able to climb steep hills fully loaded
- jack knifing of trailed implements
- may lose traction downhill with emptying spreaders
- running away downhill
- heavy 3 point linkage implements may swing causing over turning
- any other relevant answer

Total marks: 3

2. List **six** management/husbandry activities necessary for piglets on an indoor intensive system from birth to weaning.

Answer

1 mark for each of the following, maximum of 6 marks

- food
- water
- clean environment
- iron injection
- colostrum intake
- check growth rate
- vaccinate/treatments
- weigh at weaning and record litter weights
- any other relevant answer

Total marks: 6

3. Describe **three** effects of Nitrogen (N) deficiency in a crop.

Answer:

1 mark each for any 3 of the following, maximum of 3 marks

Effects:

- yellowing of the leaf
- slow or stunted growth of leaves
- less growth
- less chlorophyll for photosynthesis
- less surface area for photosynthesis
- lower yield
- reduced protein in grain
- any other relevant answer

Total marks: 3

4. Describe **three** effects of excess Nitrogen (N) in a crop.

Answer:

1 mark each for any 3 of the following, maximum of 3 marks

Allow a mark for each element of each effect below

Effects:

- weak stem (1) causing lodging (1)
- lush rank growth (1), more susceptible to disease (1)
- excessive leaching (1) leading to environmental damage and profit loss (1)
- any other relevant answer

Total marks: 3

5. For **two** environmental factors explain how they influence the rate of transpiration in plants and for **each** factor state if it will increase or decrease transpiration.

Answer:

2 marks each for any 2 of the following, maximum of 4 marks

Allow up to a maximum of 2 marks for naming the environmental factors in bold

- **Temperature** (1) – Higher temperature gives a higher rate of evaporation at the surface so more water is needed (1 mark) and transpiration rate increases (1 mark)
- **Humidity** (1) - Higher humidity reduces water evaporation at the plant surface (1 mark), and transpiration rate decreases (1 mark)
- **Air movement** (1) - Increased air movement increases evaporation (1 mark), and transpiration rate increases (1 mark)
- **Water supply** (1) - If the plant is taking in insufficient water, it cannot move the water up through the plant (1 mark) and transpiration rate decreases (1 mark)
- **Light** (1) – At higher light levels, the stomata (openings in the leaf) opens wider to allow more carbon dioxide into the leaf for photosynthesis (1 mark) and transpiration rate increases (1 mark)

Total marks: 4

6. You are deciding what cultivation method to use for a farm. You have a choice of ploughing or minimum cultivations. Discuss advantages and disadvantages of both and justify your choice.

Band 1 (1-4 marks)

Basic discussion of advantages and disadvantages of both cultivation methods. Discussion is not well developed or balanced. Limited justification with some understanding of considerations shown but limited to a few factors. There will be little or no specialist terms.

Band 2 (5-8 marks)

Adequate discussion of advantages and disadvantages of both cultivation methods. Adequate justification with good understanding of considerations shown. There will be some use of specialist terms, although they may not always be used appropriately.

Band 3 (9-12 marks)

Detailed and comprehensive discussion of advantages and disadvantages of both cultivation methods. Detailed justification with clear understanding of considerations shown. Specialist terms will be used correctly and appropriately.

Indicative content:

Ploughing

Advantages

- good weed control
- breaks up surface compaction
- produces a clean seed bed
- buries surface trash
- helps control slugs
- helps prevent diseases
- any other relevant answer

Disadvantages

- slow operation – delays to sowing
- expensive (fuel and labour)
- can cause erosion
- more moisture loss
- any other relevant answer

Minimum cultivations

Advantages

- faster
- cheaper – less fuel and labour
- keeping organic matter in top layer ie available to the plant
- conserves moisture
- any other relevant answer

Disadvantages

- poorer weed control
- can't be carried where surface compaction is an issue
- can be difficult to drill with surface trash
- poorer control of slugs
- any other relevant answer

Total marks:12

7. State **two main** characteristics of a clay soil and explain how they **each** affect plant growth.

Answer:

2 marks each for any 2 of the following; maximum of 4 marks

- Heavy (1 mark) - more difficult to create correct seed bed (1 mark)
- Cold (1 mark) - slow to warm up in spring therefore later plant growth (1 mark)
- Holds moisture (1 mark) - enables continued plant growth in droughts (1 mark)
- Holds nutrients (1 mark) - therefore nutrients available to the plant to stimulate growth (1 mark)
- Less susceptibility to erosion by water and wind (1 mark) - plants not washed or blown away (1 mark)
- Cultivating may result in compaction (1 mark) - restricts growth of plant roots and therefore moisture and nutrient uptake (1 mark)
- Wet (1 mark) - more susceptibility to slug damage (1 mark)
- Any other relevant answer

Total marks: 4

8.

8a. Explain the terms soil structure and soil texture.

Answer:

Soil structure – how the soil particles are formed into crumbs (1 mark)

Soil texture – the amount of sand, silt and clay in a soil (1 mark)

8b. State which can be more easily improved - soil structure or soil texture. Give **three** examples of how you would do this.

Answer:

Soil structure is the easiest to be improved (1 mark)

Ways to improve soil structure (1 mark for each of the following; max of 3 marks):

- adding organic matter
- subsoiling
- cultivating
- any other relevant answer

Total marks: 6

9. Define **two** of the following plant terms:

- annual
- biennial
- perennial

Give a crop example for **each** of the terms you have chosen to define.

Answer:

(1 mark for defining and 1 mark for an example) maximum of 4 marks

Annual – grows, flowers, set seeds and dies in one year

Examples: cereals, oilseed rape, linseed any other relevant example

Biennial – produces food source in first year and flowers, set seeds and dies in the second year

Examples: sugar beet, carrots, turnips and other relevant example

Perennial – carries on growing for more than two years

Examples: perennial rye grass, clover, lucerne and any other relevant example

(grass alone is not allowed as an answer for a perennial)

Total marks: 4

10. List the **main** stages of an 18 month beef system for beef calves from a dairy herd, focusing on changes to feeding and accommodation.

Answer:

2 marks for each stage, maximum of 6 marks

- 0-6 months indoors, (1 mark) milk, roughage, concentrate (1 mark)
- 6-12 months outdoors, (1 mark) grazing on good quality grass (1 mark)
- 12-18 months finishing indoors, (1 mark) fed on silage and concentrate (1 mark)

Total marks: 6

11. Wheat and potatoes have different ways of reproducing. Using the correct technical terms, explain how they each reproduce.

Answer:

Sexual reproduction – wheat (1 mark)

Asexual – potatoes (1 mark)

Wheat produces seeds. (1 mark) Their offspring are different from the parents as their genes are mixture of the parent's genes. (1 mark)

Potatoes produces tubers, (1 mark) which are a clone of their parent i.e they have the same genes. (1 mark)

Any other relevant answer

Total marks: 6

12. Give one example of a suitable sheep breed popular in the UK for **each** of the following:

- Lowland
- Upland
- Hill farms

Answer:

1 mark each for each level; maximum of 3 marks

Breed:

- Lowland - Texel, Rouge, Bleu De Maine, Hampshire Down, Poll Dorset
- Upland- Teesdale, Cheviot, Border Leicester
- Hill- Welsh, Scottish Blackface, Swaledale, Beulah Speckle Face

Any other relevant answer

Total marks: 3