

Qualification title: 360/540 Agriculture

Test title: Externally set, externally marked

Version: Paper 1

Base mark: 60

Proposed grading boundaries: 50%/60%/70%

1 Explain one way the Health and Safety at Work Act 1974 applies to machinery operation.	
Answer	
1 mark for any of the following:	
<ul style="list-style-type: none"> • duty of employer to ensure a safe system of work • duty of employee to keep themselves, others and the environment safe • any other relevant answer 	
Test spec reference: 303 1.1, AO2	Total marks: 1

2 State two considerations when selecting a pig for slaughter.	
Answer	
1 mark for any of the following, Maximum 2 marks	
<ul style="list-style-type: none"> • weight • body condition • health • market requirements • any other relevant point 	
Test spec reference: 307 AO1 3.2	Total marks: 2

3 Describe two benefits of using Cambridge or flat rolls.	
Answer:	
1 mark for any of the following benefits, Maximum 2 marks	
<ul style="list-style-type: none"> • to conserve moisture • to push down stones to avoid damage to machinery • to provide good soil to seed contact • to break up clods • to help control slugs • any other relevant answer 	
Test spec reference: 303, AO2 – 1.2	Total marks: 2

4 State **one** quality requirement for milling wheat and describe how this can be influenced by the farmer.

Answer:

Quality requirement (1 mark for any of the following)	What the farmer can do to influence (1 mark for any of the following bullet points related to the relevant quality requirement)
High Hagberg FN (falling number)	<ul style="list-style-type: none"> • Choose a variety with a high Hagberg number • Timely harvest – Hagberg number can fall due to late harvest
High Protein content	<ul style="list-style-type: none"> • Adding late Nitrogen can raise protein levels • Choose a variety with a high protein content
Correct Moisture content	<ul style="list-style-type: none"> • Timely harvest – when dry • Correct drying • Dry storage conditions
Low Mycotoxins levels	<ul style="list-style-type: none"> • Rotations –High levels after maize • Fungicide applications – at flowering reduces Mycotoxins • Cultivations – Min-till increases Mycotoxin levels
High specific weight	<ul style="list-style-type: none"> • Variety choice • Disease control
<ul style="list-style-type: none"> • Any other relevant point 	

Test spec reference: 304 – 1.2, A02

Total marks: 2

5

Describe the function of **two** internal plant structures from the list below:

- Xylem
- Phloem
- Cambium
- Epidermis

Answer

1 mark for each description; maximum of 2 marks

- Xylem- transports water and soluble mineral nutrients from the roots throughout the plant
- Phloem- transports sap. The sap is a water-based solution, but rich in sugars
- Cambium- cambium is a thin layer of cells, separating two other types of plant vascular tissue, xylem and phloem
- Epidermis- forms a boundary between the plant and the external environment.

Test spec reference: 305 - 1.1, AO1

Total marks: 2

6 Describe the annual breeding cycle for a dairy cow for all the important events include timings in days from calving.

Answer

1 mark for each of the following, Maximum of 9 marks

- Day 0 calving
- Day 1-2 calf sucking mother
- Start cycling- comes on heat every 21 days
- Day 42 start breeding
- Day 85 finish breeding- in calf
- Pregnancy Diagnosis (PD)
- Day 305 Dry off- 305 day lactation
- 280 day (9 month) Gestation period
- 60 day dry period
- Any other relevant answer

Allow for some discretion on timings

Test spec reference: Unit 307 1.2, AO1

Total marks: 9

7 Name **two** factors which may influence the rate of respiration in plants and explain how they affect plant growth.

Answer

1 mark for each factor identified (max of 2 marks) and 1 mark for each effect on plant growth (max of 2 marks)

- temperature- At a cold temperature, the enzyme used to regulate respiration slows the process, and as the temperature increases, so does respiration, until the temperature reaches a point that the enzyme cannot handle, and the respiration rate decreases. Higher respiration rate gives more plant growth.
- water availability- Water is needed for respiration, so less water means less respiration, and less plant growth
- seasonal growth- more growth needs more respiration to produce the sugars required for growth

Test spec reference: 305 – 2.1 2.3, A01 A02

Total marks: 4

8 Explain **four** ways a farmer can influence the rate of photosynthesis in their crops.

Answer

1 mark for any of the following (max of 4 marks)

- early drilling of winter crops, when daylight hours are longer
- high Nitrogen levels to maximise leaf area and chlorophyll formation
- well maintained trees and hedges to avoid shading
- good weed control to prevent shading
- south facing fields to get more sunlight
- good disease control to maximise leaf area
- good pest control to maximise leaf area
- crops grown under plastic/glass to increase temperature
- addition of carbon dioxide to glasshouses
- maintain optimum water levels
- any other relevant point

Test spec reference: 305 – 2.1, A02

Total marks: 4

9 There is a heavy clay field on the farm that is poorly drained and lacks organic matter. Discuss how this could affect the soil and the growing of crops. Justify ways to improve the soil and increase crop growth.

Answer

Band 1 (1-4 marks)

Limited discussion of effects on plant growth and development. 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 the main factors relating to the effects on plant growth and development. Some evidence of understanding of interrelationships. 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 effects on plant growth and development. Clear evidence of understanding of interrelationships. Detailed justification with clear understanding of considerations shown. Specialist terms will be used correctly and appropriately.

Indicative Content

Poor land drainage:

- raises acidity of soil
- inhibits root growth
- leaches away nutrients
- colder soil and therefore later plant growth
- less oxygen in soil
- less beneficial organisms in soil
- more poaching
- more soil compaction
- less time to work the soil

Lack of organic matter:

- reduced water holding capacity of soil, less drought proof
- less beneficial organisms in soil
- less nutrients in soil
- more nutrients will leech out
- poorer soil crumb structure, due to less aggregation
- soil more susceptible to erosion by blowing and water.

Improvements:

- install land drains
- subsoiling
- general cultivations
- addition of organic matter (straw or crop residues, farm yard manure, green manuring etc)
- maintenance of ditches and land drains
- addition of lime

Test spec reference: 304 – 1.4, 2.3, 305 – 2.1, 2.3, 3.1, 3.3, 3.4 A04

Total marks: 12

10 Explain how **four main** characteristics of a sandy soil may affect plant growth and development.

Answer:

1 mark each for any 4 characteristic explained (Max of 4 marks)

- light (texture) easy for roots and shoots to grow in the soil, improved plant growth
- warms up quickly, so earlier plant growth
- free draining, good plant growth in wet conditions, poor plant growth in a drought
- often nutrient deficient, poor for plant growth as insufficient nutrients
- susceptible to erosion by water and blowing, less top soil, plants may get blown or washed away poor for plant growth

Test spec reference: 305 – 3.3 A02

Total marks: 4

11 Describe **three** reasons why surface compaction may develop and describe **three** techniques that can be used to prevent or remove the surface compaction.

Answer:

1 mark for each of the following (max of 3 marks)

reasons surface compaction may develop:

- poorly drained wet soils
- if animals are put out too early
- driving over the same area or when wet
- driving over the field with heavy machinery
- any other relevant answer

1 mark for each of the following (max of 3 marks)

Prevention/remove surface compaction:

- don't put livestock on the field when wet or too early
- cultivations or slitting
- heavy rolling (for poaching)
- wide tyres
- avoid travelling on field when wet
- any other relevant answer

Test spec reference: 305 – 3.4 A02

Total marks: 6

12

12a Explain **one** beneficial effect of having the ideal levels of Phosphorus (P) for a crop, and why it is important.

Answer:

2 mark for any the following points identified (Max of 2 marks)

- stimulates root development (1 mark)- so roots can take in more nutrients for improved plant growth and quality (1 mark)
- increased stalk and stem strength (1 mark)- less lodging, makes crop easier and cheaper to harvest (1 mark)
- improved flower formation and seed production(1 mark) - more/better quality seed (1 mark)
- more uniform and earlier crop maturity (1 mark) - harvest earlier to reach market ahead of others for a higher price. More uniform crop- buyers prefer uniformity (1 mark)
- increased nitrogen N-fixing capacity of legumes (1 mark) - more free nitrogen available for crop growth, saves on fertiliser costs (1 mark)
- improvements in crop quality (1 mark) - better price for crop (1 mark)
- increased resistance to plant diseases (1 mark)- higher yield and better quality and therefore higher price (1 mark)
- supports development throughout entire life cycle (1mark) - better developed crops so higher yield and quality (1 mark)

12b Give **two** reasons why Phosphorus (P) deficiency in crops is not often seen in modern farming.

Answer:

1 mark for any of the following (max of 2 marks)

- regular soil analysis tests are carried out every three to four years
- more precise soil analysis tests using GPS
- variable rate fertiliser application machinery available
- any other relevant answers

Test spec reference: 304 – 2.3, A02

Total marks: 4

13 Describe **two** reasons why soil surface capping may develop and describe **two** techniques you could use to prevent or remove the surface capping.

Answer:

1 mark for each of the following (max of 2 marks)

reasons surface capping may develop:

- over cultivation on light soils
- heavy rain on light soils
- any other relevant answers

1 mark for each of the following point (max of 2 marks)

Prevention/remove surface capping:

- avoid over-cultivation of light soils
- add organic matter
- use Cambridge/ring roll to break up capping
- any other relevant answers

Test spec reference: 305 – 3.4 A02

Total marks: 4

14 State **four** different live outputs a farmer can sell from a sheep flock.

Answer

1 mark for any of the following (Max of 4 marks)

- Purebred ewe lamb replacements
- Purebred ram replacements
- Cull ewes and rams
- Finished lambs
- Store lambs

Test spec reference: 307 - 4.1 AO1

Total marks: 4