0171-502/002 Level 3 Technicals in Agriculture – March 2018
0171-30/31/32/33 Level 3 Technicals in Agriculture

Q	Acceptable answer(s)	Guidance	Max mks
1	- Group 1 – Milling - Group 2 – Specialist milling/poor quality milling - Group 3 – Biscuit - Group 4 – Feed	1 mark for each complete answer	4
2	**1 mark for each, up to 4 marks** For harvesting machine identified: 1 mark for each description, up to 4 marks - Harvesting mechanism - Basic settings - Maintaining quality of harvested products - Crop flow through the machine - Suitability for use - Mode of operation - Safety features of the machine	Accept any other relevant answer	4
3	**1 mark for each correct answer** a) Wheat – fed to humans or animals(1)/removes a lot of nutrients(1)/cash crop(1) b) Turnips – fed to cattle and sheep/grazing sheep add natural fertilisers via body processes to feed the following cereal crop c) Barley Undersown – barley to feed livestock/undersown with grass and clover for grazing/ minimising need for cultivation d) Grass – conservation and grazing/clover adds Nitrogen to the soil for the following cereal crop	Accept any other relevant answer	4

4	**1 mark for each explanation, up to 4 marks**	Accept any other relevant answer	**4**
	- Anchorage/To stop the plant from falling over (1) - Food Storage/To store energy/nutrients for reproduction (1) - Vegetative propagation for asexual reproduction of a plant (1) - Fixing nitrogen in legumes to improve soil fertility - Human harvested food source (1) - To absorb water (1) - To absorb nutrients (1) - To transport water (1) - To transport nutrients (1)		

5	**1 mark for each of the following**
	
	  i. Silts – silky (1), smear when rubbed (1)
	  ii. Clays – sticky (1), mouldable (1)
	  iii. Sands – Gritty (1)
		Accept any other relevant descriptions	**3**

6a and b	**a) Loam – 1 mark** **b) Answer indicated by red dot – 1 mark** 	6b –answer to be indicated by a cross	**2**
7a	**1 mark for any one of the following** • To correct acidity (1)	Accept any other relevant answer	**1**

		• To make it more alkaline (1) • To change pH (1) • To improve nutrient availability (1) • To improve drainage in clay soils (1) • Flocculation (1) • To improve soil health (1)		
7b	**1 marks for each effect and 1 mark for an example - up to 4 marks** • Poor crop growth (1) e.g Sugar Beet (1) • Other nutrients 'locked up' (1) e.g potassium locks up magnesium (1) • Crop disorders (1) e.g Clubroot in brassica crops (1) • Reduced soil microorganism activity (1) e.g mat of dead grass in grassland (1) • Reduced soil Organic Matter breakdown (1) e.g accumulation of organic matter/peat (1) • Legumes cannot fix Nitrogen in acidic conditions (1) e.g stunted growth in beans (1)	Accept any other relevant answer One mark for **each** effect up to the maximum of two marks One mark for **each** examples up to the maximum of two marks	**4**
8	**i)** **1 mark for each explanation, up to 4 marks** Light –sunlight intensity impacts on photosynthesis (1) which impacts on the plants ability to grow (1). Phototropism, plants grow to the direction of light (1). Spectrum of light –blue light improves growth (1). Day light length, the greater the period of light, the quicker the growth (1) **ii)** **1 mark for each explanation, up to 3 marks** **T**emperature – cold weather vernalisation (1) warmer the weather, faster the rate of growth (1) soil temperature will improve germination percentage (1), temperature will influence transpiration and potential water loss (1), crops can be damaged in extreme temperatures (1)	Accept any other relevant answer	**7**
9a	14-15 months (1 mark)		**1**

9b	**1 mark** Average days from birth to calving for the whole herd (1) or Average days from calving to the next calving for the whole herd (1)	Accept any other suitable wording/answer	1
10 a	Hill breed (1) Upland (1)		1
10 b	**1 mark** To produce lambs that have improved carcase conformation (1)/ meet market requirements (1)	Accept any other suitable answer	1
11	**1 mark for each up to a maximum of 3** • Reared on the cow for the first 6 months or on milk substitute (1) • Autumn born calves reared indoors on concentrates and silage/haylage to appetite over their first winter (1) • Spring to late Autumn – outdoors grazing grass (1) • 2nd winter – finished indoors on cereal + concentrates and silage/haylage(1)	Accept any other suitable answer	3
12	**1 mark for each to a maximum of 4** • Steady all round year supply of milk (1) • Regular income (1) • Calves available all year (1) • Milking off both grass and forage (1) • Should be no exceptionally busy periods – calving/services (1) • Introduction of replacement heifers can be spread (1) • Balanced labour profile (1)	Accept any other suitable answer	4
13	**1 mark for each relevant explanation, up to 4 marks** • Hybrid vigour increases resilience to disease (1) and increases growth rates (1). • Increased level of production (milk, meat) (1) • Improved quality of production (1) • Conformation enhances desirable traits in animals (1)	Accept any other suitable answer	4

	• <u>Adaptation</u> to environment to <u>maximise production</u> in a given environment (1) • <u>Breeding for temperament</u> (1)		
14	**Band 1 (1 – 4 marks)** Limited understanding of key topics. Answer is mainly descriptive with little evidence of discussion, mostly lacking in detail. Few or no specialist terms are used. Answer may be disorganised or ambiguous. Little evidence of interrelationship between factors. To access the higher marks in the band, discussion is supported with relevant examples. **Band 2 (5 – 8 marks)** Clear understanding of key topics and interrelationship between the factors. Evidence of developed discussion but may be lacking in some detail. There will be some use of specialist terms, although they may not always be used correctly. The information is presented mostly in a structured format. To access the higher marks in the band, discussion is supported with a range of relevant examples with clear links to the topic. **Band 3 (9 – 12 marks)** Thorough and consistent understanding of key aspects and interrelationship between the factors. Evidence of well-developed discussion. Specialist terms are used correctly and appropriately. Information is presented in a logical and structured format. To access the higher marks in the band, a comprehensive range of examples is used with comprehensive links to the topic.	**INDICATIVE CONTENT** **Sources** • Crop residue • Green Manure • Companion Crops • Livestock Manures and Slurries • Sewage Sludge • Industrial process waste products • Crop rotation • Cover crops • Reduced Tillage **Equipment** • Inversion • Non-inversion • Tillage • Controlled traffic **Positive and negative impacts on soil health and production** • Water retention within soil profile at a range of depths • Nutrient availability from the range of sources • Increased soil organism activity • Increased nutrient availability form crop residues (Carbon, P&K,) • Improved fissuring of soils • Dryer and warmer soils • Extensive root growth • Reduced soil erosion • Machine and operation efficiency • Reduced compaction • Timeliness of operations • Reduced surface crusting • Nutrient leaching	**12**

		- Heavy metal accumulation - Complaints/odours (eg ammonia) - Greenhouse gas emissions - Weeds and diseases ***For no awardable content, award 0 marks.***	