

Q1.

Total: 20 marks

(a) (i)	
Anaerobic conditions/ <i>Lactobacillus</i> species/ fermentation/ carbohydrates in grass/ converted to (weak) acids/ lowers pH/ kills bacteria/ grass preserved	4(3)
(ii)	
Cut grass when dry to have increased carbohydrate in grass/ cut at correct heading-out stage to encourage lactic acid (or weak acid) production/ cut in the afternoon to take advantage of maximum photosynthesis (or to increase carbohydrate)/ double (or precision) chopping (of grass) to increase surface area (or for greater bacterial access (or activity) or to release more sugars)/ roll well to expel air (or to provide anaerobic conditions)/ seal tightly to exclude air (or to provide anaerobic conditions)/ additives to increase carbohydrate/ wilting to increase carbohydrate concentration	4(2 + 1)
(iii)	
<i>Lactobacillus</i>	
(b) (i)	
Cut correct stage, not too heavy/ cut when weather forecast is dry/ ted frequently/ dry/ bale/ leave in field after baling/ store under cover	
(ii)	
Stimulates "scratch factor"/ Introduces microorganisms to rumen/ supports rumen development	

Q2.

Total: 40 marks

(a) (i)		8(2)															
	<table border="1"> <thead> <tr> <th></th> <th>Silage</th> <th>Hay</th> </tr> </thead> <tbody> <tr> <td>Conservation technique</td> <td>Reduces pH</td> <td>Reduces moisture</td> </tr> <tr> <td>Additives used</td> <td>Molasses/ Bacterial inoculants/ Enzymes</td> <td>Organic acids/ Bacterial inoculants/ Sulphur based preservatives</td> </tr> <tr> <td>Moisture levels</td> <td>55-60%</td> <td><18%</td> </tr> <tr> <td>Storage</td> <td>In bales or pit/ wrapped in plastic/ can be stored outdoors</td> <td>In round or square bales/ cannot be stored outside</td> </tr> </tbody> </table>		Silage	Hay	Conservation technique	Reduces pH	Reduces moisture	Additives used	Molasses/ Bacterial inoculants/ Enzymes	Organic acids/ Bacterial inoculants/ Sulphur based preservatives	Moisture levels	55-60%	<18%	Storage	In bales or pit/ wrapped in plastic/ can be stored outdoors	In round or square bales/ cannot be stored outside	
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(ii)																	
<i>Any three, Risk : precaution</i> Rolling machinery : Ensure handbrakes are on / Caught in a machine mechanisms : Suitable guards (or no loose clothing)/ PTO shafts : Turn off machine before making adjustments (or no loose clothing) / Stacks falling : Do not stack more than 2 high		3(2 + 2)															
(iii)																	
<i>Any one from each</i> Silage: High rainfall : decrease sugar concentration/ high rainfall : lower quality/ High temperature : increased sugar concentration/ High rainfall : More compaction from machinery		2(2 + 1)															

Hay: High rainfall : will not dry out correctly/ High temperature, dry faster/ High rainfall : More compaction from machinery/ high rainfall : lower quality <i>Other suitable answers acceptable</i>	
(iv)	
<i>Any one</i> Land drainage has led to a decrease in breeding grounds for some species/ fertilisers or manure can leech into waterways/ animals can be housed during winter reducing compaction/ Silage effluent has a high BOD	2
(b) (i)	
Not allowed to dry fully/ baled and wrapped as silage is/ uses both hay and silage preservation techniques/ preserved like silage but dried out more	2
(ii)	
As a dust-free feed for horses as an alternative to hay	2