

2: Animal nutrition – Topic questions

Paper 6

The questions in this document have been compiled from a number of past papers, as indicated in the table below.

Use these questions to formatively assess your learners' understanding of this topic.

Question	Year	Series	Paper number
1	2016	June	62

The mark scheme for each question is provided at the end of the document.

You can find the complete question papers and the complete mark schemes (with additional notes where available) on the School Support Hub at www.cambridgeinternational.org/support

1 Some students test the composition of three liquid food supplements.

- (a) (i) State the chemical test the students would use to show that protein is present in a liquid sample of a food supplement.

.....[1]

The students carried out this test for protein on liquid samples of food supplements **P**, **Q** and **R**.

Food supplements **P** and **R** contained protein.

- (ii) Complete Table 1.1 to show the results from the students' tests for protein.

Table 1.1

food supplement	colour at start	colour at end
P		
Q		
R		

[2]

The students carried out a test for vitamin C on liquid samples of food supplements **P**, **Q** and **R**.

When iodine solution is mixed with starch, a blue-black colour is observed. Vitamin C stops this blue-black colour from forming.

Step 1 The students labelled a test-tube **P** and added 3 cm³ of food supplement **P** to the test-tube.

Step 2 They added 1 cm³ of starch solution to test-tube **P**.

Step 3 The students added iodine solution to the test-tube, one drop at a time. They counted the drops as they added them. They shook the test-tube gently after adding each drop and stopped adding drops when a blue-black colour remained.

A blue-black colour remained in **P** after **12** drops of iodine solution had been added.

Step 4 They repeated steps **1** to **3** with food supplements **Q** and **R**.

A blue-black colour remained in **Q** after **1** drop of iodine solution had been added.

A blue-black colour remained in **R** after **5** drops of iodine solution had been added.

Table 1.2 shows how the number of drops of iodine solution added relates to the vitamin C content of the food supplement.

Table 1.2

number of drops of iodine solution added	vitamin C content
1	none
2–3	low
4 or more	high

- (b) Use the results of the students' experiments and the information in Table 1.2 to complete Table 1.3.

Table 1.3

food supplement	number of drops of iodine solution added	vitamin C content
P		
Q		
R		

[2]

The students carried out a test for reducing sugar on liquid samples of food supplements **P**, **Q** and **R**.

- (c) (i) Name the solution used for the reducing sugar test.

.....[1]

- (ii) Give **one** safety precaution that should be used when carrying out this test.

.....[1]

A positive result for the test for reducing sugar is the appearance of a brick-red colour.

The quicker the brick-red colour appears, the higher the concentration of reducing sugar.

Step 5 The students labelled a test-tube **P2** and added a sample of food supplement **P** to the test-tube.

Step 6 They added 2 cm³ of the test solution to test-tube **P2**.

Step 7 The students repeated steps **5** and **6** with food supplements **Q** and **R**.

Step 8 They placed test-tubes **P2**, **Q2** and **R2** into hot water, and started a timer.

Step 9 The students observed the test-tubes carefully and noted the time when the brick-red colour appeared in each test-tube.

If there was no colour change after 180 seconds (3 minutes), the students recorded 'more than 180' as the result for that test-tube.

A brick-red colour appeared in test-tube **R2** after 25 seconds and in test-tube **P2** after 1 minute and 15 seconds.

No brick-red colour appeared in test-tube **Q2**.

(d) Complete Table 1.4 to show the students' results for the reducing sugar test.

Table 1.4

test-tube	time for brick-red colour to appear/s

[2]

(e) There is a source of error in step 5 of the method for the reducing sugar test.

(i) Identify this source of error.

.....

[1]

(ii) Suggest apparatus that could be used to minimise this source of error.

.....[1]

(f) State **one** other source of error in the method used for the reducing sugar test.

Suggest how to improve the method to minimise this source of error.

error

.....

improvement

.....

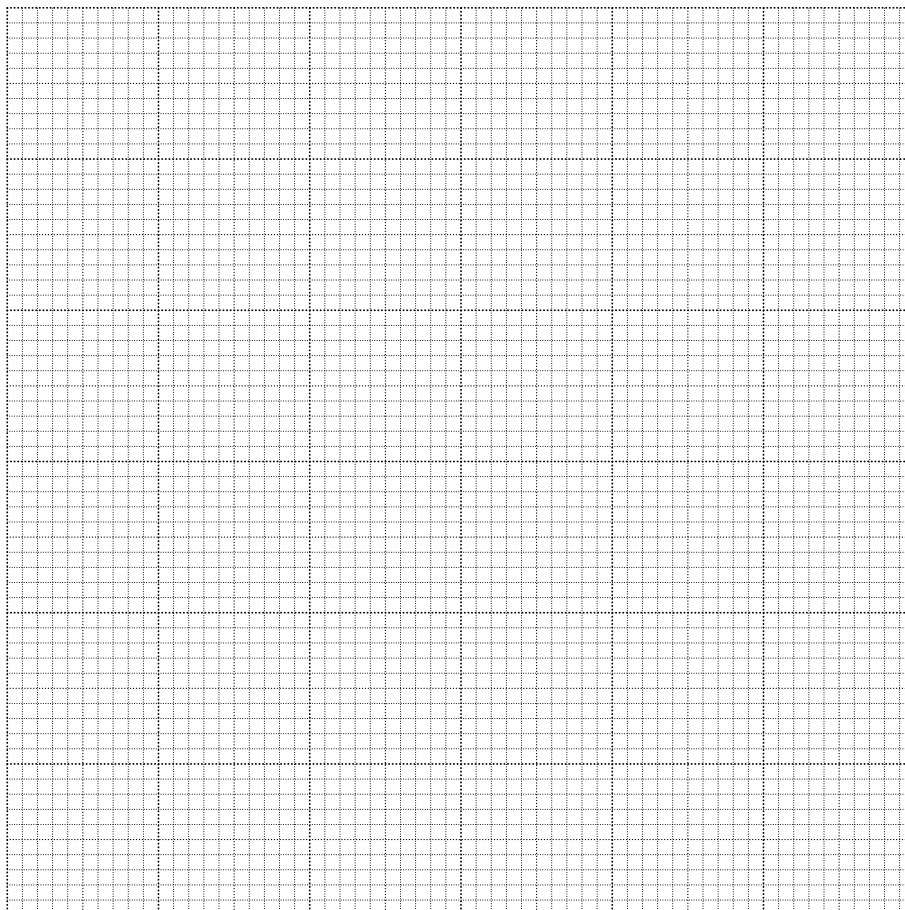
[2]

(g) Table 1.5 shows the protein content of five foods.

Table 1.5

food	protein content of food/g per 100 g
maize	3.2
rice	7.1
potato	2.0
yam	1.5
sorghum	11.3

(i) Plot a graph of the data shown in Table 1.5.



[4]

- (ii) It is recommended that a six-year-old child eats 20 g of protein per day.

Calculate the mass of sorghum a six-year-old child must eat each day to obtain 20 g of protein.

Show your working.

Give your answer to the nearest whole number.

..... g

[2]

[Total: 19]

Abbreviations used in the Mark Scheme:

;	separates marking points
/	alternatives
I	ignore
R	reject
A	accept (for answers correctly cued by the question, or guidance for examiners)
AW	alternative wording (where responses vary more than usual)
AVP	any valid point
ecf	credit a correct statement / calculation that follows a previous wrong response
ora	or reverse argument
()	the word / phrase in brackets is not required, but sets the context
<u>underline</u>	actual word given must be used by candidate (grammatical variants excepted)
max	indicates the maximum number of marks that can be given

Question	Answer	Marks												
1 (a) (i)	Biuret	[1]												
1 (a) (ii)	<table border="1"> <thead> <tr> <th>food supplement</th><th>colour at start</th><th>colour at end</th></tr> </thead> <tbody> <tr> <td>P</td><td>blue</td><td>lilac</td></tr> <tr> <td>Q</td><td>blue</td><td>blue ;</td></tr> <tr> <td>R</td><td>blue</td><td>lilac ;</td></tr> </tbody> </table> <p>rows P and R correct – 1 mark row Q correct – 1 mark</p>	food supplement	colour at start	colour at end	P	blue	lilac	Q	blue	blue ;	R	blue	lilac ;	[1]
food supplement	colour at start	colour at end												
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Q	blue	blue ;												
R	blue	lilac ;												
1 (b)	<table border="1"> <thead> <tr> <th>food supplement</th><th>number of drops of iodine solution added</th><th>vitamin C content</th></tr> </thead> <tbody> <tr> <td>P</td><td>12</td><td>high</td></tr> <tr> <td>Q</td><td>1</td><td>none</td></tr> <tr> <td>R</td><td>5 ;</td><td>high ;</td></tr> </tbody> </table> <p>mark each column</p>	food supplement	number of drops of iodine solution added	vitamin C content	P	12	high	Q	1	none	R	5 ;	high ;	[2]
food supplement	number of drops of iodine solution added	vitamin C content												
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Q	1	none												
R	5 ;	high ;												
1 (c) (i)	Benedict's (solution / reagent) ;	[1]												

Question	Answer	Marks								
1 (c) (ii)	idea of eye protection / safety when using heat qualified ;	[1]								
1 (d)	<table border="1"><tr><td>test-tube</td><td>time for brick red colour to appear / s</td></tr><tr><td>P2</td><td>75;</td></tr><tr><td>Q2</td><td>more than 180</td></tr><tr><td>R2</td><td>25;</td></tr></table> <p>P2 = 1mark both Q2 and R2 = 1mark</p>	test-tube	time for brick red colour to appear / s	P2	75;	Q2	more than 180	R2	25;	[2]
test-tube	time for brick red colour to appear / s									
P2	75;									
Q2	more than 180									
R2	25;									
1 (e) (i)	volume of food supplement may not be the same ;	[1]								
1 (e) (ii)	syringe / burette / graduated pipette / measuring cylinder / balance / scales ;	[1]								
1 (e) (ii)	<table border="1"><thead><tr><th>Source of error</th><th>Improvement</th></tr></thead><tbody><tr><td>idea of difficult to be sure of end point / difficult to see when the colour changes ;</td><td>white or black background / compare with standard / control / use a colorimeter;</td></tr><tr><td>cannot add tubes to hot water / monitor colour change, in three tubes simultaneously ;</td><td>do tubes separately / other people to do other tubes ;</td></tr></tbody></table>	Source of error	Improvement	idea of difficult to be sure of end point / difficult to see when the colour changes ;	white or black background / compare with standard / control / use a colorimeter;	cannot add tubes to hot water / monitor colour change, in three tubes simultaneously ;	do tubes separately / other people to do other tubes ;	[max 2]		
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1 (g) (i)	A – axes labels with units ; S – even scale and plots to fill at least ½ of grid both directions ; P – plots accurate to ± ½ square ; B – bars of equal width, not touching and with equal space between them ;	[4]								
1 (g) (ii)	177 ; (20 ÷ 11.3) × 100	[2]								
[Total: 19]										