

2: Animal nutrition – Topic questions

Paper 5

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	52

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

Read through all the questions on this paper carefully before starting work.

- 1** You are going to test the composition of three liquid food supplements: **P**, **Q** and **R**.

Use the eye protection provided.

Read through steps 1 to 5 before starting the experiment.

- (a)** You will test the three food supplements, **P**, **Q** and **R**, for vitamin C.

Only **two** of the food supplements contain a high amount of vitamin C.

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

Step 1 Label a test-tube **P** and add 3 cm³ of food supplement **P** to the test-tube.

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

Step 3 Add iodine solution to test-tube **P**, one drop at a time. Count the drops as you add them. Gently shake the test-tube from side to side after adding each drop. Stop adding drops when a blue-black colour remains **or** when you have added 20 drops of iodine solution.

Step 4 Record the number of drops added in Table 1.2.

Step 5 Repeat steps **1** to **4** with food supplements **Q** and **R**.

Table 1.1 shows how the number of drops of iodine solution added relates to the vitamin C content of the food supplement.

Table 1.1

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

- (i) Use your results and the information in Table 1.1 to complete Table 1.2.

Table 1.2

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

[2]

- (ii) There is a source of error in step 3 of the method for the vitamin C test.

Identify this source of error **and** suggest why it is a source of error in the experiment.

.....

.....

.....

..... [2]

- (b) (i) You will now test the food supplements, **P**, **Q** and **R**, to find their reducing sugar content.

A positive result for the test for reducing sugar is a colour change from blue.

The quicker the colour changes, the higher the concentration of reducing sugar.

Read through steps 6 to 11 before starting the experiment.

Step 6 Label a test-tube **P2** and add 3 cm³ of food supplement **P** to the test-tube.

Step 7 Add 3 cm³ of the reducing sugar test solution to test-tube **P2**.

Step 8 Repeat steps 6 and 7 with food supplements **Q** and **R**.

Step 9 Raise your hand to request a beaker of hot water.

Step 10 Place test-tubes **P2**, **Q2** and **R2** into the beaker of hot water, and **immediately** start the timer.

Step 11 Observe the test-tubes and in Table 1.3 record the time as soon as the colour changes from blue.

If there is no colour change after 180 seconds (3 minutes), stop timing and record 'more than 180' as the result for that test-tube.

Table 1.3

test-tube	time for colour change/s

[3]

(ii) Name the solution used to test for reducing sugars.

..... [1]

(c) State **one** 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]

(d) Some students carried out the test for protein on food supplements **P**, **Q** and **R**.

(i) State the chemical test you would use to show that protein is present.

..... [1]

(ii) Food supplements **P** and **R** contain protein. Food supplement **Q** does not contain protein.

Complete Table 1.4 to show the results from the students' tests for protein.

Table 1.4

food supplement	colour at start	colour at end
P		
Q		
R		

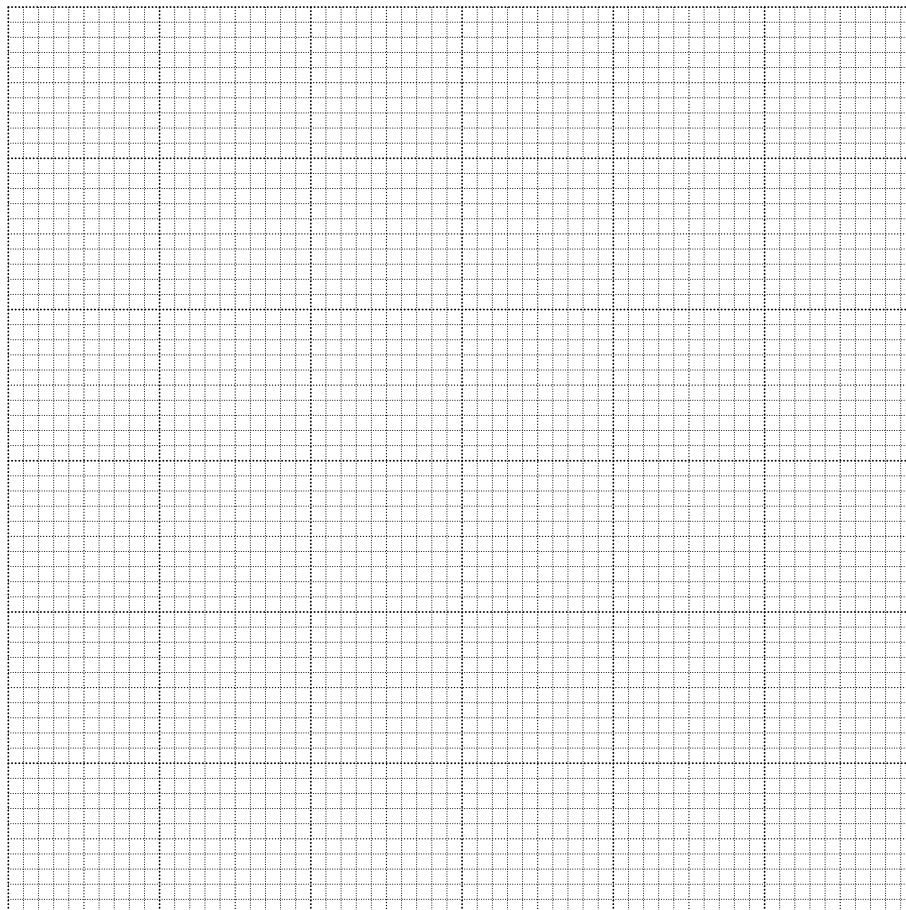
[2]

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

Table 1.5

food	protein content of food/g per 100g
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)	larger number of drops for P & R than Q ; P and R both have vitamin C and Q has none ;	[2]						
1 (a) (ii)	using drops of / a dropper for iodine solution ; each drop will be a different volume / amount ; OR drops dribble down side of test-tube ; not all reaches liquid in bottom ;	[2]						
1 (b) (i)	all cells completed ; time to colour change in R less than P ; OR two positive results of very similar time ; more than 180 recorded for Q ;	[3]						
1 (b) (ii)	Benedict's (solution / reagent) ;	[1]						
1 (c)	<table><tr><th>Source of error</th><th>Improvement</th></tr><tr><td>idea of difficult to be sure of colour change ;</td><td>white or black background / compare with standard / compare with a control ;</td></tr><tr><td>cannot add all tubes to hot water simultaneously/cannot monitor colour change in three tubes simultaneously ;</td><td>do tubes separately ;</td></tr></table>	Source of error	Improvement	idea of difficult to be sure of colour change ;	white or black background / compare with standard / compare with a control ;	cannot add all tubes to hot water simultaneously/cannot monitor colour change in three tubes simultaneously ;	do tubes separately ;	[max 2]
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Question	Answer	Marks												
1 (d) (i)	Biuret	[1]												
1 (d) (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 ;	[2]
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1 (e) (ii)	<p>177; $(20 \div 11.3) \times 100$</p>	[2]												
[Total: 19]														