

Human Nutrition

Mark Scheme

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Human Nutrition
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Mark Scheme

Time Allowed: 46 minutes

Score: /38

Percentage: /100

Question	Answer				Mark	Guidance
<p>1 (a)</p>		<i>lentil</i>	<i>chi</i>	<i>soya bean</i>	[3]	Any two boxes correctly completed = 1 mark
<i>shape of seed</i>	round / circular / disc-like / biconvex / flat & round / AW	circular / round / spherical / irregular / pointed / tear shape / AW	elongate / oval / AW			
<i>appearance of seed coat</i>	varied / speckled / patterned / AW	uneven / ridged / rough / AW	even / smooth / uniform / AW			
<p>(b)</p>	<p><i>variable to change:</i> temperature; <i>variable to measure:</i> number of seeds (germinated);</p>				[2]	
<p>(c) (i)</p>	<p>Drawing of lentil seedling from Fig. 1.2</p> <p>O – outline;</p> <p>S – size;</p> <p>D – fork in first leaf and split testa revealing cotyledon;</p> <p>L – two labels;</p>				[4]	<p>R. shading R. sketched / artistic lines</p> <p>Drawing larger than photograph (> 61 mm)</p> <p>A. labels: radicle / root / stem / shoot / plumule / leaf / cotyledon / testa / seed coat. I. Label lines which do not touch the part or cross</p>

<p>(ii)</p>	<p><i>Magnification of drawing</i></p> <p>measurement: 61 ± 1 [mm];</p> <p>measurement of ST on their drawing ± 1 [mm];</p> <p>formula: drawing length \div original length;</p> <p>correct magnification;</p>	<p>[4]</p>	<p>mm given in question, If different unit e.g. cm, then units must be present.</p> <p>R. no clear indication of ends of line between S and T but allow e.c.f. for calculation.</p> <p>If correct answer then award last 2 marks irrespective of formula.</p> <p>If incorrect answer then award 1 for correct working. R. if incorrectly rounded e.g. 2.6 for 2.66</p>
<p>(d) (i)</p>	<p><i>Protein test</i></p> <p>add <u>biuret</u> solution / biuret A and B / biuret 1 and 2 / copper sulphate and potassium / sodium hydroxide;</p> <p><u>blue</u> to purple / mauve / lilac / AW;</p>	<p>[2]</p>	<p>A. correct chemical symbols I. copper sulphate or sodium / potassium hydroxide alone</p> <p>A. other correct tests. e.g. Xanthoproteic – yellow to orange Millons – flesh to reddish brown albusix – yellow to green R. if heated or boiled.</p>
<p>(ii)</p>	<p><i>Fat test</i></p> <p>add alcohol / ethanol;</p> <p>pour / add to water;</p> <p>white / cloudy / emulsion formed / AW;</p>	<p>[3]</p>	<p>Max 2 if describe grease spot test.</p>

<p>(e) (i)</p>	<p><i>Plotting bar chart</i></p> <p>A – label axes and even scale;</p> <p>S – size plots to fill half or more on both axes;</p> <p>P – plot;</p> <p>C – columns do not touch;</p> <p>K – key or label [protein and fat];</p>	<p>[5]</p>	<p>A. vertical or horizontal bars. Line graph max 3, A,S and K</p> <p>I. graphs drawn side by side or above one another on the grid. Minimum accepted = names of beans and %.</p> <p>Do not award if columns exceed printed grid.</p> <p>If no scale / no seeds labelled, P = 0 Accurate to ± 0.5 of grid square. P. allow 2 errors.</p> <p>A. protein and fat columns touching if space between different seed columns. R. columns of unequal widths.</p>
<p>(ii)</p>	<p><u>soya</u> (bean);</p>	<p>[1]</p>	
<p>(f)</p>	<p><i>measure</i>– starting and final temperature / change in temperature;</p> <p><i>control</i>– mass of sample / volume of water / distance of flame to tube;</p> <p>one safety measure: fume cupboard / tongs AW / lab coat / goggles / correct ref. to hair / ties;</p>	<p>[3]</p>	
		<p>[Total: 27]</p>	

2 (a) (i)	light 19-21 and dark 20-22 ;	[1]	
(ii)	1:1 ;	[1]	
(iii)	smooth / wrinkled / have a dent / speckled / size / shape / AW ;	[1]	
(b)	<p><i>any 5 from:</i> crushing grain in preparation ONCE only for either test ;</p> <p><i>protein test:</i> reagent: biuret (solution) ; colour change observed: – blue to purple ;</p> <p><i>fat test:</i> add alcohol / ethanol ; water is added to alcohol ; emulsion formed / clear to cloudy / milky / white ;</p>	max [5]	R heating

Question	Answer	Mark	Comments
(c)	<u>oats</u> ; <i>any 2 from:</i> fat content <u>highest</u> ; protein content high ; fat has a higher energy content than protein ;	max [3]	
		[Total: 11]	