

# GCSE 2004

## *June Series*



## Mark Scheme

### Biology (Human)

#### *3415/H*

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Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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*Dr Michael Cresswell Director General*

## GCSE BIOLOGY (HUMAN)

### INFORMATION FOR EXAMINERS

#### 1. General

The mark scheme for each question shows:

- the marks available for each part of the question;
- the total marks available for the question;
- the typical answer or answers which are expected;
- extra information to help the Examiner make his or her judgement and help to delineate what is acceptable or not worthy of credit or, in discursive answers, to give an overview of the area in which a mark or marks may be awarded.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example:  
where consequential marking needs to be considered in a calculation;  
or the answer may be on the diagram or at a different place on the script.

In general the right hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

#### 2. Emboldening

- 2.1** In a list of acceptable answers where more than one mark is available ‘any **two** from’ is used, with the number of marks emboldened. Each of the following lines is a potential mark.
- 2.2** A bold **and** is used to indicate that both parts of the answer are required to award the mark.
- 2.3** Alternative answers acceptable for a mark are indicated by the use of **or**. (Different terms in the mark scheme are shown by a / ; e.g. allow smooth / free movement.)

#### 3. Marking points

##### 3.1 Marking of Quality of Written Communication

Where *Quality of written communication* appears in the mark scheme, one mark is to be awarded for either of the following points:

- Using correct scientific terms
- Correct sequencing or linking of ideas or points

The mark scheme will specify which of the points is to be awarded in a particular question. A QoWC mark can be awarded for a scientific answer, even if it is not accurate. It cannot be awarded for a nonsensical or non-scientific answer.

On the script, the QoWC tick should be identified by a ‘q’ written next to it.

##### 3.2 Marking of lists

This applies to questions requiring a set number of responses, but for which candidates have provided extra responses. The general principle to be followed in such a situation is that ‘right + wrong = wrong’.

Each error/contradiction negates each correct response. So, if the number of error/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as \* in example 1) are not penalised.

Example 1: What is the pH of an acidic solution? (1 mark)

Candidate	Response	Marks awarded
1	4,8	0
2	green, 5	0
3	red*, 5	1
4	red*, 8	0

Example 2: Name two planets in the solar system. (2 marks)

Candidate	Response	Marks awarded
1	Pluto, Mars, Moon	1
2	Pluto, Sun, Mars, Moon	0

### 3.3 Use of chemical symbols/formulae

If a candidate writes a chemical symbol/formula instead of a required chemical name, full credit can be given if the symbol/formula is correct and if, in the context of the question, such action is appropriate.

### 3.4 The marking of quantitative relationships

Full credit can be given for a correct quantitative relationship expressed in:

- named units;
- physical quantities;
- standard symbols;
- a combination of physical quantities and units.

No credit can be given for any quantitative relationship expressed in terms of:

- a combination of physical quantities, units and symbols;
- a diagram, e.g. the ohm's law triangle, unless the rest of the answer shows clearly that the candidate understands the relationships involved.

### 3.5 Marking procedure for calculations

**3.5.1** Full marks can be given for a correct numerical answer, as shown in the column 'answers', without any working shown. However:

- if the answer is incorrect, mark(s) can be gained by correct substitution/working and this is shown in the 'extra information' column;
- if the answer is correct, but an incorrect relationship is written in the working, then no marks can be awarded (see 3.5.2).

**3.5.2** Where calculations are based on incorrectly recalled relationships, neither the incorrectly recalled relationship, nor the resulting calculation based on the incorrect relationship, will be credited.

### 3.6 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

### 3.7 Errors carried forward

There should be no error carried forward from a previous answer which has been based on wrong science. Any error in the answers to a structured question should be penalised once only.

Examples

- (a) A candidate who calculates average speed using  $\text{speed} = \text{time}/\text{distance}$  **and** then proceeds to use this incorrect answer to calculate an acceleration based on the correct quantitative relationship should be given credit for the use of the correct acceleration relationship but none for either numerical answer.
- (b) A candidate who incorrectly calculates average speed using  $\text{speed} = \text{distance}/\text{time}$  and then proceeds to use this incorrect value to calculate an acceleration based on the correct quantitative relationship, should be given credit for the use of both correct quantitative relationships **and** for the correct substitution and use of the incorrect value in the calculation of the rate of acceleration.

Papers should be constructed in such a way that the number of times errors can be carried forward are kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation e.c.f. in the marking scheme.

### 3.8 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

### 3.9 Brackets

(.....) is used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

### 3.10 Interpretation of marginal points

There will be times when the answer is almost, but not quite, correct. Some examiners would award a mark while others would not. In any one script, an attempt should be made to balance these nearly correct answers by giving the mark on some occasions but not on others. If this is not done, the marking would end up being too lenient or too harsh.

### 3.11 Unexpected Correct Answers not in the Mark Scheme

The Examiner should use professional judgement to award credit where a candidate has given an unexpected correct answer which is not covered by the mark scheme. The Examiner should consult with the Team Leader to confirm the judgement. The Team Leader should pass this answer on to the Principal Examiner with a view to informing all examiners.



**GCSE Biology (Human)  
Higher Tier 3415/H**

**3415H Q1**

question	answers	extra information	mark
(a)(i)	protease	accept peptidase <b>or</b> named protease e.g. pepsin / trypsin allow 'proteinase'	1
(ii)	amino acids	accept peptides / polypeptides / peptones	1
(b)	points plotted accurately	$\pm \frac{1}{2}$ square deduct <b>1</b> mark per error	2
	best fit curve <b>or</b> ruled point-to-point	if double line within $\frac{1}{2}$ square  allow sharp apex  do <b>not</b> allow single straight line  if no points line defines points  if (5,0) not plotted only penalise <b>1</b> mark  bar graph wide bars – <b>no</b> marks  bar graph $\pm \frac{1}{2}$ square max <b>2</b> for points	1
(c)(i)	<b>2 or</b> correct from candidate's graph	$\pm \frac{1}{2}$ square	1
(ii)	stomach		1
(d)	proteins are large / product is small		1
	proteins (may be) insoluble / product is soluble		1
	cannot be absorbed / cannot enter blood <b>or</b> cannot pass through gut lining	accept reverse referring to product	1
total			10

## 3415H Q2

question	answers	extra information	mark
(a)(i)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• <u>chemical</u> messenger</li> <li>• <u>chemical</u> / <u>substance</u> released in one part to have effect elsewhere in body</li> <li>• <u>chemical</u> / <u>substance</u> which affects another / target organ / tissues / cells</li> </ul>	allow <u>chemical</u> from <u>endocrine</u> gland	1
(ii)	in blood / circulatory system / any named part including plasma	extra wrong answer would cancel example <b>not</b> red blood cells	1
(b)	<p><b>Quality of written communication:</b> correct use of at least two relevant scientific terms spelt phonetically</p> <p>any <b>three</b> from:</p> <p><u>Oral contraceptives:</u></p> <p>(benefit)</p> <ul style="list-style-type: none"> <li>• prevent (unwanted) pregnancy <b>or</b> prevent egg release</li> <li>• regulate menstrual cycle / periods</li> </ul> <p>(problems)</p> <ul style="list-style-type: none"> <li>• prolonged use may prevent later ovulation / cause infertility</li> <li>• named side-effect on female body e.g. circulatory problems / weight gain / nausea / headache / breast cancer / mood swings</li> <li>• increased promiscuity / increase in STD's / STI's</li> <li>• named side-effect on environment e.g. feminisation of fish <b>or</b> lowered sperm count in human males</li> </ul> <p><u>Fertility drugs:</u></p> <p>(benefit)</p> <ul style="list-style-type: none"> <li>• can enable woman to have children <b>or</b> to become pregnant <b>or</b> stimulates egg release</li> </ul> <p>(problem)</p> <ul style="list-style-type: none"> <li>• multiple births</li> </ul>	<p>e.g. pregnancy, ovulation, FSH, oestrogen, progesterone, ovary, follicle, circulation, thrombosis, feminisation, sperm count, STD</p> <p>Q ✓ or Q X</p> <p>for full marks must score at least <b>one</b> re contraceptives <b>and</b> at least <b>one</b> re fertility drugs</p> <p>if unclear which type of hormone maximum <b>2</b> marks from 3</p>	<p>1</p> <p>3</p>
total			6

## 3415H Q3

question	answers	extra information	mark
(a)	burning fossil fuels / named example	accept <u>driving</u> cars / lorries etc burning fuels in power stations ignore combustion unqualified do <b>not</b> accept catalytic converter on its own <b>or</b> emissions from power stations	1
(b)(i)	pollutants / smoke <u>breathed in</u>		1
(ii)	SO <sub>2</sub> and deaths rise (and fall) at same times <b>or</b> SO <sub>2</sub> and deaths parallel each other / show same pattern		1
(iii)	no – could be due to some other factor / pollutant / to smoke <b>or</b> correlation not precise / described	explanations must come to a conclusion named examples must be plausible allow ‘coincidence’	1
total			4



## 3415H Q4

question	answers	extra information	mark
(a)	A = protein (coat)	accept capsid / capsomere	1
	B = DNA / gene(s) / genetic material / nucleic acid	allow RNA do <b>not</b> allow chromosome	1
(b)(i)	any <b>two</b> from:  <ul style="list-style-type: none"> <li>• skin</li> <li>• scabs / clot</li> <li>• mucus</li> <li>• stomach acid / gut protease</li> </ul>	allow tears	2
(ii)	diagram shows extensions of intact cell membrane around viruses		1
(iii)	antibodies	allow enzymes re (ii) allow interferon ignore antitoxins / proteins allow immunoglobulins	1
(c)	<u>virus</u> is transferred		1
	(virus in) blood / body fluids – transfer (via needles)		1
total			8

## 3415H Q5

question	answers	extra information	mark
(a)(i)	lower – <b>B</b> loses less (water / mass) than <b>C</b> <b>or</b> described in terms of petroleum jelly	accept converse re Leaf <b>C</b>	1
(ii)	yes - <b>B</b> and <b>C</b> lose less than <b>D</b> <b>or</b> <b>B</b> and <b>C</b> lose more than <b>A</b> <b>or</b> <b>D</b> loses the <u>most</u> <b>or</b> <b>A</b> loses the <u>least</u>	do <b>not</b> accept just ‘all leaves lose some weight’	1
(b)(i)	<b>X</b> = stoma  <b>Y</b> = guard cell	accept stomata / stomatal pore do <b>not</b> accept air space	1  1
(ii)	petroleum jelly blocks stomata / pores <b>or</b> petroleum jelly prevents water loss <b>or</b> petroleum jelly waterproofs  water (mainly) lost via stomata / pores / <b>X</b> <b>or</b> stomata on lower surface only	allow pores are blocked in <b>B</b>	1  1
total			6

## 3415H Q6

question	answers	extra information	mark
(a)	38.09 <b>or</b> 38.1 (%)	accept range 35.8 – 40.4  accept showing 145 (144 – 146) – 105 (104 – 106) <b>or</b> correct calculation with incorrect answer <u>for 1 mark</u>	2
(b)	any <b>two</b> from:  • arms shorter in relation to legs  • brain size bigger <b>or</b> speech area of brain better developed  • hunted in organised groups  • better use of hands <b>or</b> used tools <b>or</b> made tools <b>or</b> used fire	accept walking upright <b>or</b> bipedal <b>or</b> standing erect  accept better speech <b>or</b> able to communicate (better)	2
total			4

## 3415H Q7

question	answers	extra information	mark
(a)	(calcium) – replaces calcium lost from bone <b>or</b> stops loss of calcium from bone	accept bones made of calcium  accept strengthen / harden bones <b>or</b> makes less porous <b>or</b> needed for growth / repair of bones	1
	(vitamin D) – for absorption of calcium	accept for the use of calcium in the body	1
(b)	ligament broken or torn or damaged	accept partly broken <b>or</b> partly torn  do <b>not</b> allow if mention both the torn ligament and the broken bone	1
(c)	bones not held together	accept bones can move too much <b>or</b> bones pulled apart <b>or</b> dislocation possible	1
	damage to synovial membrane <b>or</b> synovial membrane produces fluid	accept swelling occurs	1
total			5

## 3415H Q8

question	answers	extra information	mark
(a)(i)	atherosclerosis	correct spelling <b>or</b> phonetically correct	1
(ii)	less blood <u>reaches heart</u> (should not imply general circulation)	accept heart muscles	1
	less oxygen reaches heart <b>or</b> less respiration <b>or</b> less energy <b>or</b> not enough energy (for heart muscles) <b>or</b> <u>heart cells</u> die	accept heart muscles accept no energy (ignore reference to food)  do <b>not</b> accept build up of blood pressure	1
(b)(i)	should not base evidence on small numbers <b>or</b> small sample may be unrepresentative	accept remove effect of anomalous results or data more accurate / more reliable or gives more representative sample or gives big spectrum or cover a good range of population	1
(ii)	older person may have a low cholesterol level <b>or</b> has eaten to reduce cholesterol <b>or</b> medicine to reduce blood pressure	accept younger person may have high cholesterol level <b>or</b> eat wrong diet accept results show averages <b>or</b> older person may be below average accept son may have a heart defect <b>or</b> factors other than age must be considered <b>or</b> mention other factors such as stress / activity levels <b>or</b> cholesterol level depends on diet not on age <b>or</b> there are other causes of heart attack than cholesterol accept other relevant factors	1
(iii)	women aged 65 – 74	both points are required for the mark	1
total			6

## 3415H Q9

question	answers	extra information	mark
(a)(i)	A – (glands or cells which) produce milk	accept where milk is stored	1
	B – has pores so milk can pass out  nipple provides contact for baby's mouth	accept where milk is released  accept suckling the nipple stimulates milk flow / secretion of prolactin	1
(ii)	any <b>two</b> from:  <ul style="list-style-type: none"> <li>• milk should have protein reduced or used diluted</li> <li>• needs to have carbohydrate / sugar added</li> <li>• vitamin C <b>or</b> orange juice should be added</li> </ul>	accept cow's milk has too much protein  accept cow's milk does not have enough carbohydrate / energy  accept cow's milk is low in vitamin C  ignore references to regulated or modified	2
(b)	baby's head turns towards finger / stimulation <b>or</b> starts sucking on finger		1
	enables baby to find the breast / nipple / mammary gland for feeding		1
total			6



## 3415H Q11

question	answers	extra information	mark
(a)(i)	respiration		1
(ii)	9600	if correct answer, ignore working / lack of working  $\frac{80 \times 12000}{100}$ for 1 mark	2
(b)	any <b>three</b> from:  <ul style="list-style-type: none"> <li>• dilates / widens <b>or</b> muscle in wall relaxes <b>or</b> sphincter opens</li> <li>• more blood flows near skin surface <b>or</b> more blood through capillaries</li> <li>• heat lost by radiation / convection / conduction</li> <li>• heat loss from blood / cools blood</li> </ul>	do <b>not</b> accept expands or just gets bigger   ignore evaporation	3
(c)	hypothalamus / brain		1
total			7

## 3415H Q12

question	answers	extra information	mark
(a)	chromosome	accept chromosomes	1
(b)	<u>drawing shows:</u>  <u>just 2 chromosomes</u>  one long + one short		1  1
total			3



## 3415H Q13

question	answers	extra information	mark
(a)(i)	sensory / afferent		1
(ii)	<u>on diagram:</u> arrow (next to neurone <b>A</b> ) pointing towards spinal cord <b>and</b> arrow (next to neurone <b>B</b> ) pointing towards muscle		1
(b)	chemical (released) <b>or</b> neurotransmitter <b>or</b> by diffusion	accept correct named example of a neurotransmitter	1
(c)	<u>on diagram:</u> <b>X</b> labelling muscle <b>or</b> motor end plate	do <b>not</b> accept on stretch receptor	1
total			4

## 3415H Q14

question	answers	extra information	mark
	<p>any <b>five</b> from:</p> <ul style="list-style-type: none"> <li>• genetic variation exists in a population <b>or</b> variation caused by mutation / change in gene / in DNA</li> <li>• larger voles have smaller <math>\frac{\text{S.A.}}{\text{Vol.}}</math> <b>or</b> have more fat</li> <li>• larger voles lose less heat / are better insulated <b>or</b> more energy stored</li> <li>• larger voles survive</li> <li>• larger voles breed</li> <li>• larger voles pass on (beneficial) gene / allele / mutation / DNA</li> </ul>	<p>'they' accept as larger voles</p> <p>ignore characteristic</p>	5
total			5

## 3415H Q15

question	answers	extra information	mark
(a)(i)	one of two (/ of several) forms of <u>a</u> gene <b>or</b> (a variant) form of <u>a</u> gene		1
(ii)	expressed even if only one copy inherited <b>or</b> <u>expressed</u> / <u>seen</u> in heterozygote		1
(b)(i)	nervous	ignore brain	1
(ii)	Man / affected = <b>Hh and</b> Wife / unaffected = <b>hh</b>	N.B. can pick up chain of logic at any point correctly derived from candidate's previous line	1
	correct gametes from Parental genotypes	need full diagram	1
	F <sub>1</sub> genotypes correctly derived from P gametes		1
	identification of <b>Hh</b> in F <sub>1</sub> as having Huntington's		1
	correct probability from F <sub>1</sub> genotypes e.g. $\frac{1}{2}$ / 0.5 / 50% / 1 in 2 / 1:1 / 50:50	<b>not 1:2 or 50/50</b>	1
total			8

## 3415H Q16

question	answers	extra information	mark
(a)	hold <u>cells</u> together <b>or</b> prevent flow of <u>cells</u> <b>or</b> trap <u>cells</u>		1
(b)	12500	if correct answer, ignore working / lack of working  $\frac{100}{0.008}$ for <b>1</b> mark  ignore any units	2
(c)(i)	size RBC approximately same size capillary <b>or</b> no room for more than one cell <b>or</b> <u>only one can fit</u> <b>or</b> RBC is <u>too</u> big	allow use of numbers  do <b>not</b> accept capillaries are narrow	1
(ii)	more oxygen released (to tissues) <b>or</b> more oxygen taken up (from lungs)  and any <b>two</b> from:  • slows flow <b>or</b> more time available  • shorter distance (for exchange) <b>or</b> close to cells / capillary wall  • more surface area exposed		1  2
(d)	CO combines with <u>haemoglobin</u> <b>or</b> carboxyhaemoglobin formed  Irreversibly / more readily  reduces oxygen transport / uptake (by the cell)	accept reacts with haemoglobin	1  1  1
total			10

## 3415H Q17

question	answers	extra information	mark
(a)	aerobic respiration		1 1
		'anaerobic respiration' = 1 mark	
(b)	any <b>five</b> from:  <ul style="list-style-type: none"> <li>• glucose is a small molecule</li> <li>• glucose passes through filter <b>or</b> glucose is filtered out of blood <b>or</b> glucose enters the capsule / kidney tubule / Q</li> <li>• glucose reabsorption <b>or</b> glucose taken (back) <u>into blood</u></li> <li>• cells lining tubule have microvilli / shape described <b>or</b> cells lining tubule have large surface area</li> <li>• active transport</li> <li>• up concentration gradient</li> <li>• use of energy / ATP</li> <li>• long tubule for more reabsorption</li> </ul>	do <b>not</b> accept ' <u>filtered</u> ' into blood / out of tubule	5
total			7

## 3415H Q18

question	answers	extra information	mark								
(a)	<table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"><u>Ampicillin</u></td> <td style="text-align: center;"><u>Tetracycline</u></td> </tr> <tr> <td style="text-align: center;">✓</td> <td style="text-align: center;">–</td> </tr> <tr> <td style="text-align: center;">–</td> <td style="text-align: center;">–</td> </tr> <tr> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> </table>	<u>Ampicillin</u>	<u>Tetracycline</u>	✓	–	–	–	✓	✓	<p>accept blank <b>or</b> cross <b>or</b> –</p> <p>1<sup>st</sup>: mark by rows to maximum <b>3</b> marks</p> <p>2<sup>nd</sup>: if no marks by rows, mark by columns to maximum <b>1</b> mark</p> <p>table completely blank = <b>0</b> marks</p>	3
<u>Ampicillin</u>	<u>Tetracycline</u>										
✓	–										
–	–										
✓	✓										
(b)	<p>1<sup>st</sup>: Yes (no mark)</p> <p>2<sup>nd</sup>: all formed from same original cell</p> <p>by asexual reproduction / no fusion / not sexual</p> <p>offspring cells are genetically identical <b>or</b> all have a copy of the insulin gene / of the plasmid</p>	<p>if 'no' - read on for logical argument e.g. loss of plasmid <b>or</b> gene mutation</p> <p>must be <u>one</u> cell i.e. <u>bacterium</u></p> <p>allow reference to 'mitosis'</p>	1 1 1								
total			6								

## 3415H Q19

question	answers	extra information	mark
(a)(i)	force sperm along (sperm duct)	accept peristalsis (in sperm duct)  answer should have idea of muscle action causing sperm to move  do <b>not</b> accept answers such as sperms pass or go through	1
(ii)	blood pressure in spongy tissue increases <b>or</b> more blood enters than leaves <b>or</b> spaces fill with blood	accept blood in spongy tissue  accept more blood in penis do <b>not</b> accept penis fills with blood	1
	so penis becomes erect	accept penis can enter vagina	1
(b)	<b>A</b> is Human Chorionic Gonadotrophin or HCG		1
	causes secretion of progesterone <b>or</b> increases secretion of progesterone <b>or</b> keeps corpus luteum intact	do <b>not</b> accept progesterone and oestrogen	1
	<b>B</b> is progesterone		1
	keeps uterine <u>lining</u> in place <b>or</b> stops uterine lining breaking down	accept keeps placenta in place do <b>not</b> accept uterus or uterus wall	1
total			7

## 3415H Q20

question	answers	extra information	mark
(a)(i)	<b>B</b> because attached bone does not move when muscle contracts <b>or</b> is less movable	accept that attachment to <b>A</b> moves when the muscle contracts <b>or</b> is more movable	1
(ii)	a pivot or fulcrum between skull and vertebral column  muscle provides effort / force for movement	accept bone forms a rigid lever  accept information from a diagram	1  1
(b)(i)	enables body to balance <b>or</b> absorb shock	accept body balanced round centre of gravity or maintains centre of gravity  do <b>not</b> accept cushions unless further explained	1
(ii)	fused together  so force from legs can be transmitted to vertebral column <b>or</b> from vertebral column to legs	accept fixed (together)  accept to provide a firm connection between pelvic girdle <b>or</b> legs and vertebral column  do <b>not</b> accept shock absorber	1  1
total			6



3415H Q21

question	answers	extra information	mark
(a)	mitochondria		1
(b)	<p><b>Quality of written communication:</b> for correct linking of points</p> <p>any <b>two</b> from:</p> <ul style="list-style-type: none"> <li>• (fibres fully contracted) enable atria or ventricles to contract fully <b>or</b> to pump out all of blood</li> <li>• (long recovery) allows atria / ventricles to fill (with blood)</li> <li>• (difficult to fatigue) can keep heart beating continuously <b>or</b> heart does not have to stop to rest <b>or</b> does not need to rest</li> </ul>	<p>correct linking of any <b>1</b> of:</p> <p>full contraction with action of atria or ventricles, long period of rest with enlargement <b>or</b> filling of atria <b>or</b> ventricles, lack of fatigue with prolonged action</p> <p>accept so can empty or can exert full pressure or causes full strength of contraction</p> <p>accept gives time for muscles <b>or</b> atria <b>or</b> ventricles to relax fully between beats</p> <p>accept can supply all need of body <b>or</b> no part of body is short of blood <b>or</b> prevents heart attack</p>	<p>1</p> <p>2</p>
(c)(i)	all of curve should be drawn lower than the pre-11 p.m. line		1
(ii)	<p>any <b>one</b> from:</p> <ul style="list-style-type: none"> <li>• less blood flow <b>or</b></li> <li>• reduced muscle action <b>or</b></li> <li>• less blood pumped</li> <li>• when body horizontal heart has less work to do</li> </ul>	<p>accept muscles need less blood or less energy / less respiration or less respiratory substrate accept less physical activity or no physical activity accept body lying down instead of horizontal</p>	1
total			6

## 3415H Q22

question	answers	extra information	mark
(a)(i)	development of behaviours which are learned <b>or</b> development of a store of information <b>or</b> development of rituals or customs <b>or</b> collective human achievement	accept example of rituals or customs such as burial of the dead accept development of community <b>or</b> religion <b>or</b> beliefs <b>or</b> norms	1
(ii)	greater memory <b>or</b> greater learning capacity <b>or</b> development of speech	accept development of communication (made group living possible) accept development of reasoning ( <b>not</b> thinking)	1
(b)(i)	provided a better protein diet <b>or</b> more varied diet <b>or</b> allowed settled existence	accept less need to wander in search of food <b>or</b> improved food supplies allowed larger groups to develop <b>or</b> villages to be founded <b>or</b> use of wool / skins for clothing do <b>not</b> accept did not compete with humans for food	1
(ii)	greater chance of survival of groups	accept not all persons concerned with food provision <b>or</b> some people able to follow / develop other activities	1
(iii)	allowed language / information to be written down / stored / passed on <b>or</b> allowed communication <u>between separate groups</u>	accept formulation of laws <b>or</b> customs / rituals to be recorded accept pass down history	1
total			5