



**2010 Human Biology**

**Higher**

**Finalised Marking Instructions**

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## GENERAL MARKING ADVICE: HUMAN BIOLOGY

The marking schemes are written to assist in determining the 'minimal acceptable answer' rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates' evidence, and apply to marking both end of unit assessments and course assessments.

1. There are no **half marks**. Where three answers are needed for two marks, normally one or two correct answers gain one mark.
2. In the mark scheme, if a word is **underlined** then it is essential; if a word is **(bracketed)** then it is not essential.
3. In the mark scheme, words separated by/are **alternatives**.
4. There are occasions where the second answer negates the first and no marks are given. There is no hard and fast rule here, and professional judgement must be applied. Good marking schemes should cover these eventualities.
5. Where questions on data are in two parts, if the second part of the question is correct in relation to an incorrect answer given in the first part, then the mark can often be given. The general rule is that candidates should not be penalised repeatedly.
6. If a numerical answer is required and units are not given in the stem of the question or in the answer space, candidates must supply the units to gain the mark. If units are required on more than one occasion, candidates should not be penalised repeatedly.
7. Clear indication of understanding is what is required, so:
  - if a description or explanation is asked for, a one word answer is not acceptable
  - if the questions ask for **letters** and the candidate gives words and they are correct, then give the mark
  - if the question asks for a word to be **underlined** and the candidate circles the word, then give the mark
  - if the result of a calculation is in the space provided and not entered into a table and is clearly the answer, then give the mark
  - **chemical formulae** are acceptable eg CO<sub>2</sub>, H<sub>2</sub>O
  - contractions used in the Arrangements document eg DNA, ATP are acceptable
  - words not required in the syllabus can still be given credit if used appropriately eg metaphase of meiosis.
8. Incorrect **spelling** is given. Sound out the word(s),
  - if the correct item is recognisable then give the mark
  - if the word can easily be confused with another biological term then **do not** give the mark eg ureter and urethra
  - if the word is a mixture of other biological words then **do not** give the mark, eg mellum, melebrum, amniosynthesis.

9. **Presentation of Data:**

- if a candidate provides two graphs or bar charts (eg one in the question and another at the end of the booklet), mark both and give the higher score
- if the question asks for a line graph and a histogram or bar chart is given, then do not give the mark(s). Credit can be given for labelling the axes correctly, plotting the points, joining the points either with straight lines or curves (best fit is rarely used)
- if the  $x$  and  $y$  data are transposed, then do not give the mark
- if the graph used less than 50% of the axes, then do not give the mark
- if 0 is plotted when no data is given, then do not give the mark (ie candidates should only plot the data given)
- no distinction is made between bar charts and histograms for marking purposes. (For information: bar charts should be used to show discontinuous features, have descriptions on the  $x$  axis and have separate columns; histograms should be used to show continuous features; have ranges of numbers on the  $x$  axis and have contiguous columns.)
- where data is read off a graph it is often good practice to allow for acceptable minor error. An answer may be given  $7.3 \pm 0.1$ .

10. **Extended response questions:** if a candidate gives two answers where there is a choice, mark both and give the higher score.

11. **Annotating scripts:**

- put a 0 in the box if no marks awarded – a mark is required in each box
- indicate on the scripts why marks were given for part of a question worth 3 or 2 marks. A tick near answers will do.

12. **Totalling scripts:** errors in totalling can be more significant than errors in marking:

- enter a correct and carefully checked total for each candidate
- do not use running totals as these have repeatedly been shown to lead to more errors.

## 2010 Human Biology Higher

### Marking scheme

#### Section A

1.	C	16.	D
2.	D	17.	B
3.	D	18.	C
4.	B	19.	A
5.	D	20.	B
6.	A	21.	A
7.	C	22.	B
8.	D	23.	C
9.	C	24.	B
10.	D	25.	C
11.	A	26.	A
12.	A	27.	D
13.	C	28.	D
14.	A	29.	B
15.	B	30.	C

Marking instructions

2010 Human Biology

Section B

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
1. (a)	Meiosis/meiotic (division)	1		
(b)	A = 46      B = 23      C = 23	1		
(c)	B has <u>two</u> chromatids/strands and C has <u>one</u> (chromatid/ chromosome/strand) B is double stranded and C is single stranded <i>Must refer to relative numbers in B and C.</i>	1	Diploid/haploid B chromosomes in pairs and C on its own	Homologous pairs
(d)	Independent/random assortment <u>and</u> crossing over	1	Formation of chiasmata Independent alignment Cross over	
(e)	Seminiferous tubules	1	Semiferrous (phonetic) Seminal	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates												
2. (a)	<table border="1"> <thead> <tr> <th>Stage</th> <th>Name</th> <th>Location</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Glycolysis</td> <td>Cytoplasm</td> </tr> <tr> <td>B</td> <td>Krebs/Tricarboxylic/TCA/ Citric acid cycle</td> <td>Matrix of mitochondrion</td> </tr> <tr> <td>C</td> <td>Cytochrome/Hydrogen/ electron transfer system/chain</td> <td>Cristae of mitochondrion</td> </tr> </tbody> </table> <p style="text-align: center;"><i>1 mark per correct row</i></p>	Stage	Name	Location	A	Glycolysis	Cytoplasm	B	Krebs/Tricarboxylic/TCA/ Citric acid cycle	Matrix of mitochondrion	C	Cytochrome/Hydrogen/ electron transfer system/chain	Cristae of mitochondrion	3	Krebs (no cycle) Lumen of mitochondrion  Cristae or matrix (on its own)	
Stage	Name	Location														
A	Glycolysis	Cytoplasm														
B	Krebs/Tricarboxylic/TCA/ Citric acid cycle	Matrix of mitochondrion														
C	Cytochrome/Hydrogen/ electron transfer system/chain	Cristae of mitochondrion														
(b)	Pyruvic acid – 3 (carbons) (or 2 x 3) <u>and</u> citric acid 6 (carbons)	1	2 x 6C													
(c)	R is NAD <u>and</u> R transports/delivers/carries hydrogen <b>1 mark</b>  S is Oxygen <u>and</u> S removes <u>hydrogen</u> /acts as the (final) <u>hydrogen</u> acceptor/joins with <u>hydrogen</u> to form water <b>1 mark</b>	2	R = NADH <sub>2</sub>													
(d)	<table border="1"> <thead> <tr> <th>Situation</th> <th>Respiratory substrate</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Prolonged starvation</td> <td>Protein/amino acids</td> <td>Carbohydrates/glycogen/glucose <u>and</u> fats/lipids have been used up <b>or</b> protein is the <u>only</u> (remaining) energy source/substrate <b>or</b> all other substrates/energy sources used up</td> </tr> <tr> <td>Towards the end of a marathon race.</td> <td>Fat/fatty acids/ lipids</td> <td>Carbohydrate/glycogen/glucose has been used up.</td> </tr> </tbody> </table> <p style="text-align: center;"><i>4points =2 marks, 3/2 points=1 mark.</i></p>	Situation	Respiratory substrate	Explanation	Prolonged starvation	Protein/amino acids	Carbohydrates/glycogen/glucose <u>and</u> fats/lipids have been used up <b>or</b> protein is the <u>only</u> (remaining) energy source/substrate <b>or</b> all other substrates/energy sources used up	Towards the end of a marathon race.	Fat/fatty acids/ lipids	Carbohydrate/glycogen/glucose has been used up.	2	Muscle          Fat has twice the amount of energy as carbohydrate Glycerol on own				
Situation	Respiratory substrate	Explanation														
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Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
<p>3. (a) (i)</p> <p>(ii)</p> <p>(iii)</p>	<p>P = antigen    Q = antibody</p> <p>B - lymphocyte</p> <p>(A) T-lymphocyte makes direct contact/acts directly with infected cells/bacteria <u>and</u> destroys them/breaks them down/perforates wall/membrane. <i>(must describe the cell-mediated response)</i></p> <p><b>OR</b></p> <p>Helper T-cells recognise antigens/infected cells/bacteria <u>and</u> activate other lymphocytes/macrophages</p> <p>(B) Macrophage – engulfs/envelops bacteria/pathogens/microbes <i>(must describe the engulfing process or mention engulf)</i></p>	<p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p>	<p>B cell</p> <p>Kills/destroys bacteria Direct contact with viruses Cell-mediated response without description</p> <p>Eats/surrounds bacteria engulfs infection/viruses/antigen phagocytosis without description Not just digestion of bacteria</p>	
<p>(b) (i)</p> <p>(ii)</p>	<p><b>active and naturally</b></p> <p><b>active and artificially</b></p>	<p><b>1</b></p> <p><b>1</b></p>		
<p>(c)</p>	<p>Immune system/response/antibodies attacks body <u>cells</u></p> <p><b>OR</b></p> <p><u>Immune</u> system recognises body cells/own antigens as foreign/non-self</p>	<p><b>1</b></p>	<p>Immune system does not recognise own cells/antigens Immune system attacks own antigens</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
4. (a)	Lactose can be broken down into <u>two</u> sugars/monosaccharides/ glucose and galactose <b>OR</b> Lactose is built up from <u>two</u> sugars/monosaccharides/glucose and galactose	1	Products/compounds/things/ carbohydrates	
(b)	1. volume of milk 2. volume of enzyme/lactase 3. concentration of enzyme/lactase 4. temperature of the milk/solution 5. age of milk <b>Any 2 needed</b>	1	Type of milk Concentration of milk Mass of lactase Time Temperature on its own Room temperature	
(c)	Correct scales and labels on axes – 1 mark Points correctly plotted and lines drawn going to zero – 1 mark Lines distinguished from each other (eg key given) – 1 mark <i>At least 1 zero needs to be marked on the axes</i>	3	-1 for using less than 50% of <u>either</u> axis -1 for transposing axes -1 for drawing a bar graph	
(d)	Human milk contains more <u>lactose</u> (than cow's milk)	1		
(e)	Lactose/substrate is used up/starts to limit the rate of reaction	1		
(f)	Repeat experiment <u>and</u> calculate an average	1		
(g) (i)	An <u>inborn</u> error of metabolism/ <u>inborn</u> metabolic disorder/error	1	Gene mutation	
(ii)	(Blood) glucose levels will remain/stay at normal/constant concentration/does not rise/stays low	1	Blood glucose levels will decrease/become low/zero Glucose levels are low	



Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
5. (a) (i)	Prolactin	1		
(ii)	Synthesis/production of proteins/antibodies	1		
(b) (i)	Colostrum	1		
(ii)	Contains <u>more/many</u> antibodies/protein/vitamin A <b>OR</b> Contains <u>less</u> fat/lactose/vitamin C <b>OR</b> Colostrum yellower/more watery	1	Later milk does not contain antibodies	
(iii)	Allows for <u>bonding/attachment</u>	1	Emotional tie	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates												
6. (a)	Emulsification of <u>fats/lipids/oils</u> <b>OR</b> Breakdown of <u>fats/lipids/oils</u> to smaller droplets/globules	1	Digestion of fats Breakdown of fats (on its own)	Molecules												
(b)	Absorbed across/enters <u>villi/microvilli</u> (of small intestine) Passes into <u>lacteal</u> Transported through <u>lymphatic system/lymph</u> (to bloodstream)  <i>All three described for 2 marks Two described for 1 mark</i>	2														
(c)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th colspan="2"><i>Blood vessel</i></th> </tr> <tr> <th><i>Substance</i></th> <th>Hepatic portal vein</th> <th>Hepatic vein</th> </tr> </thead> <tbody> <tr> <td>Glucose</td> <td style="text-align: center;"><b>Higher</b></td> <td style="text-align: center;"><b>Lower</b></td> </tr> <tr> <td>Urea</td> <td style="text-align: center;"><b>Lower</b></td> <td style="text-align: center;"><b>Higher</b></td> </tr> </tbody> </table> <i>1 mark per correct row</i>		<i>Blood vessel</i>		<i>Substance</i>	Hepatic portal vein	Hepatic vein	Glucose	<b>Higher</b>	<b>Lower</b>	Urea	<b>Lower</b>	<b>Higher</b>	2		
	<i>Blood vessel</i>															
<i>Substance</i>	Hepatic portal vein	Hepatic vein														
Glucose	<b>Higher</b>	<b>Lower</b>														
Urea	<b>Lower</b>	<b>Higher</b>														
(d)	(The presence of) valves <b>OR</b> Large lumen/diameter/bore (reduces resistance to blood flow)	1	Wider veins													
(e)	Detoxification	1	Detox													

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
7. (a) (i)	118 beats/min <b>Units essential</b> (bpm ok)	<b>1</b>	118 (no units)	
	(ii) 5	<b>1</b>		
	(iii) 8.4/8.5/8.6	<b>1</b>		
(b) (i)	<p>Increased muscle contraction occurs/muscles work harder</p> <p>This requires more energy/ATP</p> <p>Not enough oxygen (reaches muscles to release enough energy)/oxygen debt builds up (in muscles)</p> <p>(More) <u>anaerobic</u> respiration occurs <b>OR</b>  Pyruvic acid not converted to acetyl CoA/pyruvic acid converted to lactic acid</p> <p style="text-align: center;"><i>Any 3 points for two marks, 2 points for 1 mark  Clearly tick where points are allocated</i></p>	<b>2</b>	No/less oxygen reaches muscles	
(ii)	<p>(Use monitor to) keep pulse rate below/at <u>150 beats/min</u> when running – <b>1 mark</b></p> <p>This will keep <u>lactic acid</u> levels low/at 1.4 mMol/l <b>OR</b>  This prevents a build up of <u>lactic acid</u> – <b>1 mark</b></p>	<b>2</b>	Prevents muscle fatigue	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
<p>8. (a) (i)</p>	<p>High/higher glucose concentration</p> <p>Large/larger increase in glucose concentration</p> <p>Glucose concentration decreases slowly/does not return to starting value/norm</p> <p style="text-align: right;"><b>any 2 needed</b></p> <p><i>Must refer to glucose in at least one answer</i></p>	1		
<p>(b) (i)</p>	<p>Pituitary (Gland)</p>	1		
<p>(ii)</p>	<p>Produce a high volume of urine/increased water loss</p> <p>Low concentration of urine</p> <p>Dehydration/thirst/low blood pressure/lower water concentration in blood</p> <p>Less water <u>reabsorbed</u> (in kidney/back into blood)</p> <p>No change in permeability of kidney tubules</p> <p>Cannot control blood water level/concentration</p>	1	<p>Any other spelling of glucagon Adrenaline</p> <p>Go to toilet more often</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
<p>9. (a) (i)</p>	<p>Vesicle fuses/joins with membrane <u>and</u> neurotransmitter/it is released (into synapse/synaptic cleft) <b>OR</b></p> <p>It is released by <u>exocytosis</u> (into synapse/synaptic cleft) – <b>1 mark</b></p> <p>Neurotransmitter <u>diffuses</u> across the synapse <b>OR</b></p> <p>Travels across synapse <u>and</u> attaches to receptor – <b>1 mark</b></p>	<p>2</p>		
<p>(ii)</p>	<p>Two or more cells/axons/nerve fibres meet/converge to one cell/cell Y – <b>1 mark</b></p> <p>More neurotransmitter is released (which stimulates/binds to more receptors) <b>OR</b></p> <p>Threshold more likely to be reached – <b>1 mark</b></p>	<p>2</p>	<p>Impulses/neural pathways meet</p>	
<p>(b) (i)</p>	<p>Limbic System/hippocampus</p>	<p>1</p>		
<p>(ii)</p>	<p>Alzheimer's (disease)</p>	<p>1</p>	<p>Dementia Amnesia</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
10. (a)	<p>Monozygotic twins are <u>genetically</u> identical/share same <u>genes/DNA</u> <b>OR</b></p> <p><u>Genetic</u> factors can be discounted – <b>1 mark</b></p> <p>Therefore, any difference between them must be due to the <u>environment</u> – <b>1 mark</b></p>	2	Share genetics	
(b) (i)	<p>Environmental</p> <p>Little difference exists between the groups/pairs/all three groups/pairs are similarly affected <b>OR</b></p> <p>A high percentage of adopted (unrelated) pairs have the condition</p>	1	<p>Not just quoting figures</p> <p>Types of children</p> <p>All children have similar %/numbers</p> <p>Fewer monozygotic twins share the condition</p>	
(ii)	<p>Genetic</p> <p>The more genetic similarity the greater chance of sharing the condition <b>OR</b></p> <p>A very high percentage of monozygotic twins share the condition <u>and</u> a much lower percentage of other/adopted pairs share it</p>	1	All monozygotic twins share the condition	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11. (a)	Better healthcare/increased use of vaccination/increased use of antibiotics Example of medical advance (scanners etc) Example of a social service (eg meals on wheels, sheltered housing) Improved diet	1	Improved health Better pensions Increase in living standards Better housing	
(b)	1 More young children/0-14 group would be larger 2 Less old people/older groups (30+ ok) would be smaller	1	Graph higher at start, lower at end	
(c)	<u>More</u> health provision/doctors/hospitals (for elderly)  <u>More</u> social provision/residential care/pensions (for elderly)  <u>Less</u> school provision/teachers  Change in numbers/types of houses  <i>Any two for 1 mark</i>	1	Create more jobs	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
12. (a) (i) (ii) (iii)	Non-aggressive man and girls 1770 Children will be more aggressive/influenced/likely to copy behaviour/habits if they observe an adult of <u>their own gender/sex</u> (being aggressive)	1 1 1	Reference to only one gender	
(b)	Imitation	1		
(c)	Use children who had not seen the recording/adults with the clown Children who had seen recording of clown only	1		Any reference to adult in room



Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
13. (a)	<p>Similarity – Both (nitrogen and phosphorus application rates) peak in <u>1994</u> <b>OR</b> Both increase up to <u>1994</u> <u>and</u> both decrease after (1994) <b>OR</b> both nitrogen and phosphorus application rates are lower in <u>2006</u> than in <u>1986</u> <b>1 mark</b></p> <p>Difference – Nitrogen application rates are <u>always</u> higher than phosphorus application rates <b>OR</b> Overall decrease in nitrogen application rate is greater than overall decrease in phosphorus/nitrogen rate drops faster than phosphorus <b>1 mark</b></p>	2	<p>A specific example is <b>not acceptable</b> eg application rate of nitrogen in 1994 was 128 kg/ha and application rate of phosphorus was 45 kg/ha. <b>Trend must be described.</b></p>	Incorrect figures given
(b)	3 : 1	1		
(c) (i)	<p>Less algal blooms/less eutrophication/less fertiliser in waterways/less leaching of fertiliser Less contamination of drinking water</p>	1	<p>Less water pollution Less environmental pollution Less run-off</p>	Prevents
(ii)	<p>Decrease in (crop) yield Decrease in crop growth/rate of crop growth</p>	1	<p>Less nutrients in soil/decreased fertility Can grow less crops Growth not as strong</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
14. (a) (i)	0.28 (negative ok)	1		
(ii)	Erosion/loss of farmland/decreased crop yield/loss of homes/overcrowding/emigration	1	Loss of habitats/extinction	
(b) (i)	Carbon dioxide/Methane/CFCs/Nitrous oxides/Water vapour <i>any two</i>	1		
(ii)	Carbon dioxide – burning fossil fuels/power stations/transportation/deforestation (or description of <u>large scale</u> tree felling)/warm sea’s hold less CO <sub>2</sub>  Methane – rice fields/cattle/landfill sites/melting permafrost <i>any two</i>  CFCs – aerosols <u>and</u> fridges/freezers  Nitrous oxides – burning fossil fuels <u>and</u> agricultural soil (nitrification and denitrification)  Water – increased evaporation <u>and</u> plane travel	1	Industry	

## Section C

### 1A Discuss memory under the following headings:

- (i) **Short term memory** 5
1. Capacity is around 7 pieces of information (+/- 2)
  2. This is called the memory span
  3. Held for a (very) short period of time/seconds only/30 seconds
  4. Chunking increases memory span/capacity/information held
  5. Example of chunking described (not just 'eg phone numbers')
  6. Serial position effect named and described (or labelled graph)
  7. Encoding named and two methods mentioned (acoustic, semantic, visual, smell, taste, touch)
- (ii) **The transfer of information between short and long-term memory** 5
8. Rehearsal named and described (repetition/rehearsing of items to be memorised)
  9. Organisation named and described (putting items into groups or categories)
  10. Elaboration named and described (adding meaning to information)
  - 10.a. *mention of all three terms without description*
  - 10.b. *mention of all three descriptions without terms*
  11. Retrieval named and described (taking information out of long-term memory)
  12. Contextual cues aid retrieval/remembering
  13. Example of contextual cue given
  14. Description of a memory aid (mnemonics/mind map)

### 1B Discuss how man has attempted to increase food supply under the following headings:

- (i) **Chemical use** 4
1. Fertilisers are used to improve plant growth/provide nutrients for plants
  2. Pesticides/insecticides are used to kill/remove pests/insects
  3. Herbicides are used to kill/remove weeds
  4. Herbicides reduce competition between weeds and crops (description ok)
  5. Fungicides are used to kill fungi/reduce fungal infections
  - 5a. *Three terms (-cides) without descriptions*
  6. Antibiotics/growth hormones improve growth of animals
- (ii) **Genetic improvement** 3
7. Selective breeding (or description)
  8. Example of increased yield/increased disease resistance from selective breeding (more grain, more milk etc)
  9. Genetic engineering/genetic manipulation/genetic modification/somatic fusion
  10. Definition of genetic engineering as genes being transferred between organisms
  11. Result of genetic engineering is increased yield/disease resistance/drought resistance
- (iii) **Land use** 3
12. Deforestation/description of forest removal
  13. Marginal land use described/land reclamation/terracing hillsides
  14. Irrigation described
  15. Removal of hedgerows/creation of large fields/monoculture use
  16. Mechanisation/less man-power/crop rotation linked to more efficient use of land

**2A Discuss the biological basis of contraception.**

**10**

1. Contraception is prevention of fertilisation/pregnancy/conception
2. Fertile period lasts for a few days around day 14/mid point of menstrual cycle
3. Fertile period can be detected by rise in body temperature
4. Fertile period can be detected by changes in cervical mucus/mucus becomes thinner
5. Contraceptives can be pills/injections/implants
6. These contain oestrogen/progesterone
7. Pills usually taken for 3 weeks/one pill taken each day
8. Concentration of hormones (in blood) is increased
9. Causes negative feedback effect/Inhibitory effect on pituitary gland
10. Reduced production of FSH prevents maturation of ova/eggs
11. Reduced production of LH prevents ovulation
- 11a. *mention of reduced production of FSH and LH without functions*
12. (Prolonged/regular) breast feeding/suckling acts as contraceptive

**(8 from 12)**

**Relevance** – the following would be deemed irrelevant:

condoms, caps, sponges, female condoms, spermicides, sterilisation, vasectomy

**2B Discuss the conducting system of the heart and how it is controlled.**

**10**

1. Controlled by autonomic nervous system
2. Sympathetic speeds up heart and parasympathetic/vagus slows down heart
3. Medulla (oblongata) is control centre (in the brain)
4. Adrenaline speeds up heart rate
5. Pacemaker/SAN in right atrium (on diagram with unlabelled right atrium ok)
6. Pacemaker starts contraction/produces impulses
7. Impulses cause the atria to contract/atrial systole
8. Reaches/stimulates the AVN
9. AVN found at junction of/between atria and ventricles
10. Impulse (from AVN) carried by (conducting) nerves/fibres/bundle of His
11. (Purkinje) fibres/nerves spread out over the ventricles
12. Causes contraction of ventricles/ventricular systole
13. Followed by relaxation/resting/diastolic phase

**(8 from 13)**

**Relevance** – the following would be deemed irrelevant:

valves, blood vessels, blood cells, haemoglobin, other effects of the autonomic nervous system

*A single short reference to an irrelevant point is not penalised, but development of the point is penalised. However, two irrelevant points without development are penalised.*

*The threshold for awarding the coherence and relevance mark is 5 marks.*

[END OF MARKING INSTRUCTIONS]