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Mark Scheme (Results)

Summer 2016

Pearson Edexcel International GCSE in Human Biology (4HB0) Paper 02

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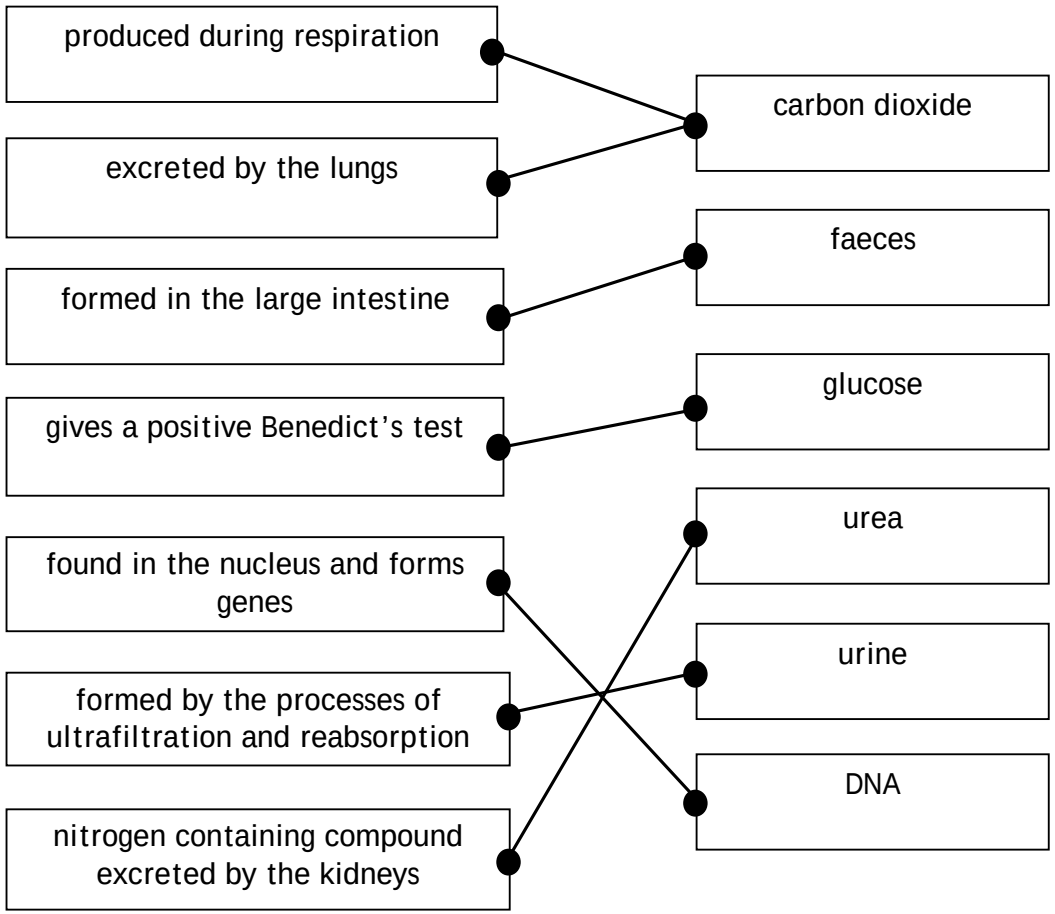
General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question number	Answer	Accept	Reject	Marks
1				7

Total question 1 = 7 marks

Question number	Answer	Accept	Reject	Marks
2 (a) (i)	experiment 1 = 4.5s; experiment 2 = 30s;			1 1
(ii)	25.5s;	ecf		1
(iii)	Any two from • exhaled air contains more carbon dioxide; • produced during respiration; • removed by lungs;	inhaled air contains less carbon dioxide for 1 mark		2
(iv)	One from • care not to suck up liquid; • care not to break glass; • sterilise/clean tube A/B/mouthpiece;			1
(v)	• bicarbonate indicator more sensitive to carbon dioxide; • change in colour clearer/more easily seen; • more accurate/easier to time colour change;			2

2 (b) (i)	<table><tr><th></th><th>longer time</th><th>shorter time</th><th>the same time</th></tr><tr><td>experiment 1</td><td></td><td>✓</td><td></td></tr><tr><td>experiment 2</td><td></td><td>✓</td><td></td></tr></table>	do not accept more than one tick on each row		1 1
(ii)	Any three from • more exercise requires more respiration/energy; • more carbon dioxide released/carbon dioxide exhaled/inhaled faster; • bicarbonate indicator changes colour quicker;			3

Total question 2 = 13 marks

Question number	Answer	Accept	Reject	Marks
3	Any 8 from • larvae/worms pass into water/found in water; • from (infected) snails; • larvae swim in water; • enter through skin/body of people in water; • larvae develop into adult worms; • inside blood vessels; • of various organs/named organs; • feed on (red) blood (cells); • worms mate/reproduce/breed; • release eggs; • pass out in urine/faeces;			

Total question 3 = 8 marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Accept</th><th>Reject</th><th>Marks</th></tr>
<tr><td>4 (a)</td><td>
<table>
<tr><th>Description</th><th>Word</th></tr>
<tr><td>duct carries both urine and sperm</td><td>urethra;</td></tr>
<tr><td>produces sperm</td><td>testis;</td></tr>
<tr><td>where fertilised ovum is implanted</td><td>uterus</td></tr>
<tr><td>produces part of seminal fluid</td><td>seminal vesicle;</td></tr>
<tr><td>where sperm is deposited during intercourse</td><td>vagina;</td></tr>
</table>
</td><td></td><td></td><td>5</td></tr>
<tr><td>(b) (i)</td><td><u>FSH</u>
Two from
• stimulates oestrogen production;
• development of follicle/egg/ovum;
• use in IVF to increase fertility ;</td><td></td><td></td><td>2</td></tr>
<tr><td>(ii)</td><td><u>Oestrogen</u>
Two from
• thickens/repairs uterus <u>lining</u>/endometrium;
• use in contraception to prevent pregnancy;
• inhibits FSH production;
• stimulates LH production;
• causes female secondary sex characteristics / named characteristic;</td><td></td><td></td><td>2</td></tr>
</table>

(iii)	<u>Oxytocin</u> • contraction of uterus muscles at birth; • milk release;			2

Total question 4 = 11 marks

Question number	Answer	Accept	Reject	Marks
5 (a) (i)	A = large intestine; C= small intestine/ileum;			1 1
(ii)	bile;			1
(b)	Any four from • bile unable to pass (into duodenum) • fats/lipids not emulsified; • reduced/slower fat digestion/fat not digested/broken down; • by lipase; • acid from stomach not neutralised; • enzymes/named enzyme not at optimum pH/reduced enzyme activity; • reduced digestion of proteins/carbohydrates/starch;			4
(c)	• surface area (for absorption) reduced; • less absorption (of products/named products of digestion); • a described effect on body e.g. lack of energy/poor haemoglobin production;			3

Total question 5 = 10 marks

Question number	Answer	Accept	Reject	Marks
6 (a)	arrow towards hand in artery and away from hand in vein;	accept arrow in the tube before or after box in right direction		1
(b) (i)	glomerulus;			1
(ii)	• larger surface area; • for faster diffusion/more blood filtered/blood filtered more quickly/allows more time for blood to be filtered; • increa se in amount of substances diffusing (into liquid);			2
(c)	• more urea/nitrogenous compounds; • more salt/named salt/ion;			2
(d)	Any three from • no (glucose) concentration gradient/equal (glucose)concentration either side of tubing; • prevents loss/diffusion of glucose; • from blood/tubing into liquid X; • otherwise blood glucose reduced; • respiration affected/glucose needed for respiration/less respiration;			3

(e) (i)	red blood cells/erythrocyte;			1
(ii)	check that no red blood cells /erythrocytes have been lost/to check that no blood enters liquid x;			1

Total question 6 = 11 marks

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