



Mark Scheme (Results)

January 2012

International GCSE Human Biology
(4HB0) Paper 01

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January 2012

Publications Code UG030680

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INTERNATIONAL GCSE HUMAN BIOLOGY 4HB0 01 – JANUARY 2012

| Question number | Answer | Marks |
|----------------------------------------------------------------------|----------------------------------------------------------|-------|
| 1 (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) | C; A; B; B; B; D; B; C; B; C; | 10 |

Total 10 marks

| Question number | Answer | Marks |
|-----------------|--------|-------|
| 2 (a) (i) | A; | 1 |
| (ii) | B; | 1 |
| (iii) | F; | 1 |
| (iv) | D; | 1 |
| (v) | C; | 1 |
| (vi) | E; | 1 |

Total 6 marks

| Question number | Answer | Marks |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 3 (a) (i) | Ribs/ribcage; | 1 |
| | (ii) spinal nerve/cord; Reject spine | 1 |
| | (iii) muscle attachment/movement/blood cell formation/support; | 1 |
| (b) | stomach; liver; small intestine/duodenum/ileum; large intestine; spleen; pancreas; kidney; gall bladder; uterus; ovary; bladder; | 4 max |
| (c) | diaphragm/Z contracts; (diaphragm) flattens; increases volume of thorax/chest cavity; decreases pressure; reason for air moving in e.g. pressure difference; | 3 max |

Total 10 marks

| Question number | Answer | | | | | Marks | |
|------------------------------------|--------------------------------------------------------------------|--------|--------------|------------|------------|--------------|---|
| 4 (a) (i) | blue black colour; Accept black on its own but not blue on its own | | | | | 1 | |
| | place powder in boiling tube; Accept test tube | | | | | 3 max | |
| | dissolve in water; | | | | | | |
| | add Benedict's solution; | | | | | | |
| | heat/boil; | | | | | | |
| | in water bath; | | | | | | |
| | observe colour at end / observe or describe correct colour change; | | | | | | |
| | use of goggles/protective gloves; | | | | | 1 | |
| | (b) | Test | Powder A | Powder B | Powder C | Powder D | 5 |
| | | Iodine | yellow/brown | blue black | blue black | yellow/brown | |
| Benedict's | | blue | brick red | blue | brick red | | |
| (one mark for each correct column) | | | | | | | |
| 4 (c) (i) | A; | | | | | 1 | |
| | D; | | | | | 1 | |
| | C; | | | | | 1 | |
| | B | | | | | 1 | |

Total 14 marks

| Question number | Answer | Marks | | | | | | | | | | | | | | |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------|-----------------------|------------------------|------------------------------------------------------|------------------------------|--------------------------------|---------------|-----------------------------|------------------------|-------------------------------|----------------|---------------------------------------|---------------|--|
| 5 | <table><tr><th>Description of substance</th><th>Name of substance</th></tr><tr><td>excreted by the lungs</td><td><i>carbon dioxide;</i></td></tr><tr><td>nitrogen-containing compound excreted by the kidneys</td><td><i>urea;</i> Reject urine</td></tr><tr><td>used in temperature regulation</td><td><i>sweat;</i></td></tr><tr><td>produced during respiration</td><td><i>carbon dioxide;</i></td></tr><tr><td>formed in the large intestine</td><td><i>faeces;</i></td></tr><tr><td>formed by filtration and reabsorption</td><td><i>urine;</i></td></tr></table> | Description of substance | Name of substance | excreted by the lungs | <i>carbon dioxide;</i> | nitrogen-containing compound excreted by the kidneys | <i>urea;</i> Reject urine | used in temperature regulation | <i>sweat;</i> | produced during respiration | <i>carbon dioxide;</i> | formed in the large intestine | <i>faeces;</i> | formed by filtration and reabsorption | <i>urine;</i> | |
| Description of substance | Name of substance | | | | | | | | | | | | | | | |
| excreted by the lungs | <i>carbon dioxide;</i> | | | | | | | | | | | | | | | |
| nitrogen-containing compound excreted by the kidneys | <i>urea;</i> Reject urine | | | | | | | | | | | | | | | |
| used in temperature regulation | <i>sweat;</i> | | | | | | | | | | | | | | | |
| produced during respiration | <i>carbon dioxide;</i> | | | | | | | | | | | | | | | |
| formed in the large intestine | <i>faeces;</i> | | | | | | | | | | | | | | | |
| formed by filtration and reabsorption | <i>urine;</i> | | | | | | | | | | | | | | | |

Total 6 marks

| Question number | Answer | Marks |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 6 (a) (i) | circle around: legs; hairs; feet; proboscis; | 3 max |
| (ii) | Typhoid/food poisoning/polio; | 1 |
| (iii) | cover food/place in a fridge; kill flies; (effective) treatment of sewage/sanitation; thorough cooking of food; | 3 max |
| (b) | e.g. yoghurt making; cheese flavouring; sewage treatment; recycling nutrients; antibiotic manufacture; vinegar production | 3 max |

Total 10 marks

| Question number | Answer | Marks |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 7 (a) (i) | sequence of nucleotides/section of DNA/part of a chromosome; give a particular characteristic/phenotype/feature; codes for amino acids; to produce protein/polypeptide; | 2 max |
| (ii) | Hidden/not expressed; Unless homozygous/two present; Accept converse argument | 2 max |
| (iii) | reduced/less oxygen transported; no oxygen | 1 Reject |
| (b) (i) | R r R r; RR Rr Rr rr; | 2 |
| (ii) | 1:3/25%/1 in 4/1/4; | 1 |
| 7 (c) | resistance to malaria; (People with the sickle cell allele) are better able to survive; and pass on allele; | 2 max |

Total 10 marks

| Question number | Answer | Marks |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 8 (a) | taking sweet, sour, bitter and salt solutions taking individually; placed on the tongue; pieces of (filter) paper/cotton buds/pipette; soaked in one solution; held in forceps/tweezers; moved across tongue/test on each area of the tongue; washing out mouth between tastings; description of fair testing; | 4 max |
| (b) (i) | back; | 1 |
| (ii) | front; | 1 |
| 8 (c) | middle; lowest numbers; | 2 |
| (d) | more reliable results; children are different; | 2 |

Total 10 marks

| Question number | Answer | Marks |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|-------|
| 9 (a) | protein; enzyme | 2 |
| (b) | amylase has an optimum temperature at 40°C; (near) body temperature; denatured at 80°C Reject reference to enzyme dying | 2 |
| 9 (c) | starch digested/broken down; | 1 |
| (d) | maltose; small molecule (so can pass through); | 2 |
| (e) | insufficient time for digestion of all starch / positive starch test would occur; | 1 |
| (f) | Mouth/salivary gland; duodenum/small intestine/pancreas; | 2 |

Total 10 marks

| Question number | Answer | Accept | Marks |
|-----------------|------------------------------------------------------------------------------------|----------------------|-------|
| 10 (a) | (i) A ball and socket; B hinge; | | 2 |
| | (ii) humerus; | Phonetically spelled | 1 |
| (b) | (i) position of biceps; tendons; (tendons) to radius and to scapula/humerus; | | 3 |
| | (ii) contracts/shortens; tendons pull (bones); | | 2 |
| 10 (c) | (i) calcium; | | 1 |
| | (ii) vitamin D formation; helps uptake/absorption of calcium ions; | | 2 |
| | (iii) ultra-violet light; causes skin cancer; sunburn/heatstroke; | | 2 max |

Total 13 marks

| Question number | Answer | Marks |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 11 (a) (i) | C; | 1 |
| (ii) | excretory; | 1 |
| (b) (i) | ureter; Reject urethra Reject urinary tract | 1 |
| (ii) | vein; Ignore renal blood to heart/from organ; deoxygenated; | 3 |
| 11 (c) (i) | 62%/63%/64%/65%; | 1 |
| (ii) | 10%//11%/12%/13%; | 1 |
| (iii) | A kidney machine at hospital; (Bar chart shows) because there are fewer people at work; Reference to actual data e.g. 36 +/- 2%; (Bar chart shows) because more unable to work; Reference to actual data e.g. 14 +/- 2%; (Bar chart shows) because more able to work but unemployed; Reference to actual data e.g. 28 +/- 2%; | 4 max |

Total 12 marks

| Question number | Answer | Marks |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 12 (a) | liver; | 1 |
| (b) (i) | $(4 \times 15) + (5 \times 15) + (2 \times 15) 60 + 75 + 30$; 165; mg; 165mg alone gains 3 marks | 3 |
| (ii) | no; over a period of three hours, body/liver breaks down 45mg; still leaves $120\text{mg}100\text{cm}^{-3}$ of blood; over legal limit/ $80\text{mg}100\text{cm}^{-3}$ (and unfit to drive); | 4 |
| (c) | cirrrosis/damage of liver/damage to brain; | 1 |

Total 9 marks
PAPER TOTAL: 120 MARKS

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