

Mark Scheme (Results) November 2009

IGCSE

IGCSE Biology (4325) Paper 2H

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| Question Number | Answer | Mark |
|-----------------|---|------|
| 1(a) | nutrition / feeding / eq; reproduction / eq; | (2) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 1(b) | remove; waste / toxins / poisons / harmful substances / eq; | (2) |

(Total 4 marks)

| Question Number | Answer | Mark |
|-----------------|--------------|------|
| 2(a)(i) | haemoglobin; | (1) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 2(a)(ii) | biconcave / biconcave described; more surface / large SA:VOL / eq; diffusion; I thin/permeable/small/lack nucleus | (2) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 2(b)(i) | shape of cell; Accept wavy outline cell membrane; cytoplasm; nucleus; Accept any nucleus not ball shaped | (3) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 2(b)(ii) | ingest / ingestion described / engulf / eq; digest / enzymes / breakdown / eq; | (2) |

(Total 8 marks)

| Question Number | Answer | Mark |
|-----------------|---|------|
| 3(a) | A rib(s) / ribcage; B diaphragm; C spine / disc / vertebra; | (3) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 3(b) | contracts; moves down / flattens / eq; | (2) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 3(c) | surface area (of alveoli) reduced / smaller alveoli; less oxygen (into blood/body); ↓ gas exchange respiration; less aerobic (respiration) / anaerobic respiration / lactic acid; less energy released; | (3) |

(Total 8 marks)

| Question Number | Answer | Mark |
|-----------------|------------------------------|------|
| 4(a) | arrow labelled P to nucleus; | (1) |

| Question Number | Answer | Mark |
|-----------------|------------------------------------|------|
| 4(b) | arrow labelled Q to cell membrane; | (1) |

| Question Number | Answer | Mark |
|-----------------|----------|------|
| 4(c)(i) | osmosis; | (1) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 4(c)(ii) | against concentration gradient / more ions inside than outside / eq; energy / ATP; | (2) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 4(c)(iii) | chlorophyll; amino acids / enzymes / protein / DNA / nucleic acid / eq; | (2) |

(Total 7 marks)

| Question Number | Answer | Mark |
|-----------------|-------------------------------------|------|
| 5(a) | ovary; fallopian tube / oviduct; | (2) |

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 5(b)(i) | A; | (1) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 5(b)(ii) | maintain uterus (lining) / stop menstruation / avoid miscarriage / eq; | (1) |

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 5(c)(i) | C; | (1) |

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 5(c)(ii) | oxygen; glucose / nutrients / food / eq; carbon dioxide / waste ONCE; urea / waste; Allow avoid mixing blood; | max (2) |

| Question Number | Answer | Mark |
|-----------------|----------------|------|
| 5(c)(iii) | 46 / 23 pairs; | (1) |

(Total 8 marks)

| Question Number | Answer | Mark |
|-----------------|--|------|
| 6(a)(i) | starch / cellulose / glucose / sucrose / protein / amino acids / fat / carbohydrate / eq; I cell wall | (2) |

| Question Number | Answer | Mark |
|-----------------|--|---------|
| 6(a)(ii) | respiration; decomposition / decay / rotting / eq; combustion / burning; | Max (2) |

| Question Number | Answer | Mark |
|-----------------|--|---------|
| 6(a)(iii) | ice caps melt / flooding; habitat destruction; food chain disruption / eq; extinction; soil erosion; climate change / hurricanes / desertification / drought /eq; | Max (3) |

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 6(b) | dissolves; water / cloud; acid (rain); harms/kills organisms; I harm to humans | Max (3) |

(Total 10 marks)

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 7 | named crop; control light / light bulbs / eq; control carbon dioxide / burning / eq; control temperature heating / eq; control water supply /eq; control humidity / mineral ions / pest; photosynthesis; growth for longer time / growth in cold season; | max (5) |

(Total 5 marks)

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 8(a) | loss of habitat; deforestation / pollution / climate change / eq; no food / no prey; hunted (by man) / predation / eq; disease / eq; less reproduction / eq; | max (3) |

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 8(b)(i) | (adult) nucleus / adult cell fused; empty egg cell / eq; (fine) pipette / microscope; electricity; Allow shock <u>mitosis</u> ; Petri dish / culture / nutrients / eq; | Max (3) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 8(b)(ii) | uterus / womb; nourish / feed / incubate / protect / placenta / allow development / allow growth / eq; | (2) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 8(b)(iii) | 0.8;; accept range of 0.79 to 0.8 allow one for working if dividing by 251 | (2) |

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 8(b)(iv) | none; | (1) |

(Total 11 marks)

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 9(a) | D; | (1) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 9(b) | homozygous recessive; Accept if circled | (1) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 9(c)(i) | foreign / genetic differences / not same tissue/self / eq; I pathogen antigen; white blood cells / named white blood cell; antibody; attack cornea cells / eq; I infection | (3) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 9(c)(ii) | stop immune system working / stop rejection / stop reaction to foreign tissue / eq; | (1) |

| Question Number | Answer | Mark |
|-----------------|------------|------|
| 9(c)(iii) | 950 / 95%; | (1) |

(Total 7 marks)

| Question Number | Answer | Mark |
|-----------------|--|------|
| 10(a)(i) | no effect / stays low / stays level / eq; light limiting / not enough light / needs light / eq; | (2) |

| Question Number | Answer | Mark |
|-----------------|--|---------|
| 10(a)(ii) | increases / eq; molecular movement / KE / eq; levels / eq; carbon dioxide limiting / chlorophyll molecules limiting; decreases / eq; enzymes denature / eq; | max (4) |

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 10(b) | same carbon dioxide / pH; same plant / species / eq; same mass of plant / eq; same water; I same oxygen | Max (2) |

(Total 8 marks)

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 11(a)(i) | 4; | (1) |

| Question Number | Answer | Mark |
|-----------------|------------------------------------|------|
| 11(a)(ii) | tertiary consumer / top carnivore; | (1) |

| Question Number | Answer | Mark |
|-----------------|--|---------|
| 11(b)(i) | movement; excretion / eq; egestion / indigestible / faeces / eq; uneaten / eaten by other organisms; death; I heat | max (2) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 11(b)(ii) | 16.09 / 16 / 16.1;; Allow one mark in working for 14 000 or 87 000 | (2) |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 11(b)(iii) | only 300 (from insects) / too much lost by respiration (of insects) / not enough energy / needs 500; | (1) |

(Total 7 marks)

| Question Number | Answer | Mark |
|-----------------|--|------|
| 12(a)(i) | risk of extinction / low in number / eq; | (1) |

| Question Number | Answer | Mark |
|-----------------|---|--------|
| 12(a)(ii) | transport / carry / eq; sucrose / sugars / carbohydrate / products of p.syn / amino acids; I food respiration; | max(2) |

| Question Number | Answer | Mark |
|-----------------|--|---------|
| 12(b)(i) | air / oxygen; respiration; carbon dioxide; photosynthesis; stop microbes / eq; | max (2) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 12(b)(ii) | glucose / carbohydrate / named carbohydrate; | (1) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 12(c) | quick / eq; large numbers; clones / genetically identical / eq; reduce deforestation; | (2) |

(Total 8 marks)

| Question Number | Answer | Mark |
|-----------------|---|------|
| 13(a) | 4.4 / 22:5;; Allow one mark in working for 22 or 5 | (2) |

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 13(b)(i) | water in; osmosis; high conc. (of water) to low conc. (of water); / eq; | Max (2) |

| Question Number | Answer | Mark |
|-----------------|--|---------|
| 13(b)(ii) | A and B: water/osmosis into chip A; in water for chip A / A in dilute solution / cell contents more concentrated /eq; A and C: more water/osmosis into chip A / more movement into chip A; temp. higher for chip A / more kinetic energy for chip A; A and D: less water/osmosis into chip A; less surface area in chip A; Accept converse | Max (5) |

(Total 9 marks)

| Question Number | Answer | Mark |
|-----------------|--|------|
| 14 | restriction; ligase; vector; DNA / plasmid; fermenter; | (5) |

(Total 5 marks)

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 15(a)(i) | small use more oxygen; (more) heat loss; respiration; surface area to volume; larger (in small shrews); | Max (3) |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 15(a)(ii) | 1920;; Allow one mark in working for 20 / 4 / 80 / 96 | (2) |

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 15(b) | vasoconstriction / eq; hair erect / eq; less sweat; idea of longer term changes / thicker fur / subcutaneous fat / eq; | max (2) |

| Question Number | Answer | Mark |
|-----------------|---------------------|------|
| 15(c)(i) | sensory / afferent; | (1) |

| Question Number | Answer | Mark |
|-----------------|----------|------|
| 15(c)(ii) | synapse; | (1) |

| Question Number | Answer | Mark |
|-----------------|-----------------------|------|
| 15(c)(iii) | arrow towards muscle; | (1) |

(Total 10 marks)

| Question Number | Answer | Mark |
|-----------------|---|---------|
| 16 | easily seen / eq; predators / easy prey / eq; no <u>camouflage</u> ; not well adapted / not well suited / adaptation / eq; struggle to survive / eq; less reproduction; less passing on of genes/characteristic / eq; | Max (5) |

(Total 5 marks)

PAPER TOTAL: 120 MARKS

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