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Mark Scheme (RESULTS)
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GCE

GCE Biology (6112/01)

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Question Number	Answer	Mark
1	1. monocytes ; 2. antibodies / immunoglobulins ; 3. eosinophils / basophils ; 4. nucleus ;	**4**

Question Number	Answer	Mark
2 (a)	**A** red blood (cell) / erythrocyte ; **B** (alveolar) epithelial cell / epithelium / squamous epithelium / ;	**2**

Question Number	Answer	Mark
2 (b)	1. {thin / eq} cells ; 2. decreases diffusion distance ; 3. permeable (to respiratory gases) ; 4. (collectively) have a large surface area ; 5. increases diffusion ; 6. of respiratory gases / oxygen / carbon dioxide ; 7. (surrounded by) capillaries ; 8. idea that movement of blood maintains {diffusion / concentration} gradient ; 9. reference to {the presence of / a description of} surfactant ;	**max 4**

Question Number	Answer	Mark
2 (c)	8.1 (dm^3) ;	**1**

Question Number	Answer	Mark
3 (a)	<table><tr><th>Carbohydrate</th><th>Enzyme</th><th>Products</th></tr><tr><td></td><td>amylase ;</td><td></td></tr><tr><td></td><td></td><td>glucose and galactose ;</td></tr><tr><td>sucrose ;</td><td>sucrase ;</td><td></td></tr></table>	**4**

Question Number	Answer	Mark
3 (b)	1. reference to active uptake / active transport (of glucose) ; 2. reference to sodium-glucose co-transport ; 3. reference to (specific) glucose carrier proteins / fewer transport proteins for fructose / more transport proteins for glucose / fructose is absorbed by diffusion (only) ;	**3**

Question Number	Answer	Mark
4 (a)	**A** aorta / aortic arch ; **B** (right) atrioventricular valve / tricuspid valve ;	**2**

Question Number	Answer	Mark
4 (b)	1. reference to coronary circulation ; 2. reference to coronary artery / coronary arteries ; 3. reference to capillaries (in wall of heart) ; 4. oxygen {transported / eq} by {red cells / haemoglobin} ; 5. oxygen diffuses out of {blood / red cells / capillaries} (to heart muscle) ;	**max 3**

Question Number	Answer	Mark
4 (c)	1. pacemaker / SAN sends {impulse / eq} (to atria) ; 2. {causing/ eq} atria to contract ; 3. {impulse / eq} reaches AVN ; 4. reference to delay at the AVN ; 5. idea that the impulse travels to ventricles via {bundle of His / Purkyne tissue / eq} ;	**max 3**

Question Number	Answer	Mark
4 (d)	1. increased {demand for / eq} {oxygen / glucose} / increased respiration ; 2. increased heart rate / heart beats faster / eq ; 3. increased stroke volume / cardiac output ; 4. increased production of carbon dioxide ; 5. reference to dilation of blood vessels in muscle ; 6. reference to adrenaline ;	**max 3**

Question Number	Answer	Mark
5 (a)	**Frostbite:** 1. reference to tissue / skin damage ; 2. due to exposure to (dry) cold / freezing ; **Trench foot:** 1. damage to toes / feet ; 2. due to immersion in cold water ;	**4**

Question Number	Answer	Mark
5 (b)(i)	1. increase in body temperature ; 2. credit manipulated quantitative comment ; 3. due to conduction of heat from water to body ;	**max 2**

Question Number	Answer	Mark
5 (b)(ii)	1. reduction in body temperature ; 2. credit manipulated quantitative comment ; 3. heat lost by {radiation / conduction / evaporation of water / convection / lower {air / room / chair} temperature} ;	**max 2**

Question Number	Answer	Mark
6 (a)	1. colostrum contains antibodies / eq ; 2. reference to imparting (passive) immunity / eq ;	**2**

Question Number	Answer	Mark
6 (b)(i)	1. colostrum has more protein (than human milk) ; 2. calculated difference (e.g. 5.7 times more protein) ; 3. colostrum has less lactose (than human milk) ; 4. calculated difference (e.g. half the concentration of lactose) ;	**max 2**

Question Number	Answer	Mark
6(b)(ii)	1. cows' milk has more protein ; 2. protein is required for (tissue) growth / eq ; 3. cows' milk has less fat ; 4. appropriate reference to benefit of less fat in diet ;	**max 2**

Question Number	Answer	Mark
7 (a)(i)	1. as altitude increases, partial pressure of oxygen in alveoli decreases / eq ; 2. credit a manipulated quantitative comment ;	**2**

Question Number	Answer	Mark
7 (a)(ii)	1. reference to low partial pressure of oxygen (at high altitudes) ; 2. haemoglobin poorly saturated with oxygen ; 3. insufficient {oxygen to maintain consciousness / oxygen reaching the brain} ; 4. reference to <u>hypoxia</u> ;	**max 2**

Question Number	Answer	Mark
7 (a)(iii)	1. wind speed ; 2. solar radiation ;	**2**

Question Number	Answer	Mark
7 (b)	**THREE** of: 1. increased lung volume /eq ; 2. increased pulmonary capillaries / eq ; 3. increased cardiac output /eq ; 4. increased numbers of red cells / eq ; 5. increased haemoglobin ; 6. increased affinity of haemoglobin (for oxygen) ; 7. increased melanin / skin pigmentation ; 8. reference to short stature / eq ;	**max 3**

Question Number	Answer	Mark
8 (a)	E D C B A ;; all correct = 2 marks, 1 error (i.e. one letter out of sequence) = 1 mark	**2**

Question Number	Answer	Mark
8 (b)	(i) 46 ; (ii) 23 ;	**2**

Question Number	Answer	Mark
8 (c)	1. {primordial (germ) cells / oogonia} divide by **mitosis** ; 2. oogonia (develop to) form primary oocytes ; 3. primary oocytes divide by **meiosis I** ; 4. to form a secondary oocyte ; 5. and a polar body ; 6. secondary oocyte divides by **meiosis II** ; 7. to form an ovum ;	**max 4**

PAPER TOTAL: 60 MARKS