

# Mark Scheme Summer 2009

GCE

## GCE O Level Human Biology (7042)

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Summer 2009

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## Contents

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	Page
1. 7042/01 (Paper 1) Mark Scheme	1
2. 7042/02 (Paper 2) Mark Scheme	15

7042/01 O LEVEL HUMAN BIOLOGY MARK SCHEME - JUNE 2009

Question Number	Answer	Mark
1(a)	<p>1 mark for each correct answer.</p> <ul style="list-style-type: none"> <li>• C - cerebrum / cerebral hemispheres / cerebral cortex;</li> <li>• E - medulla (oblongata) / brain stem;</li> <li>• F - spinal cord;          R - spine</li> </ul>	(3)

Question Number	Answer	Mark										
1(b)	<p>1 mark for each correct answer.</p> <table border="1"> <thead> <tr> <th>function</th> <th>region</th> </tr> </thead> <tbody> <tr> <td><i>balance and muscle coordination</i></td> <td>D;</td> </tr> <tr> <td><i>stimulating the action of involuntary muscles</i></td> <td>E;</td> </tr> <tr> <td><i>production of sex hormones</i></td> <td>A;</td> </tr> <tr> <td><i>intelligence and reasoning</i></td> <td>C;</td> </tr> </tbody> </table>	function	region	<i>balance and muscle coordination</i>	D;	<i>stimulating the action of involuntary muscles</i>	E;	<i>production of sex hormones</i>	A;	<i>intelligence and reasoning</i>	C;	(4)
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Question Number	Answer	Mark
1(c)	<p>1 mark for each correct answer from any of the following - maximum 2 marks .</p> <ul style="list-style-type: none"> <li>• controls involuntary muscles / heart beat / breathing;</li> <li>• regulates many homeostatic mechanisms;</li> <li>• loss of control / processes of above leads to death;</li> </ul>	(2)

(Total 9 marks)

Question Number	Answer	Mark
2(a)	<p>1 mark for each correct answer.</p> <ul style="list-style-type: none"> <li>• heat is generated within body;</li> <li>• skin loses heat to environment;</li> </ul>	(2)

Question Number	Answer	Mark
2(b)(i)	<p>1 mark for each correct answer.</p> <ul style="list-style-type: none"> <li>• at least 6 points correctly plotted;</li> <li>• remaining 3 points correctly plotted;</li> <li>• points joined;</li> <li>• both curves identified;</li> </ul>	(4)

Question Number	Answer	Mark
2(b)(ii)	<p>1 mark for correct answer.</p> <ul style="list-style-type: none"> <li>• 32 to 44 minutes (accept values from candidate's graph)</li> <li>• accept +/- 0.5</li> </ul>	(1)

Question Number	Answer	Mark
2(b)(iii)	<p>1 mark for correct answer.</p> <ul style="list-style-type: none"> <li>• cold water chills throat / stomach;</li> <li>• temperature of blood leaving these organs falls;</li> <li>• affects rest of circulatory system;</li> </ul>	(2)

Question Number	Answer	Mark
2(b)(iv)	1 mark for each correct answer. <ul style="list-style-type: none"> <li>hypothalamus / brain;</li> </ul>	(1)

Question Number	Answer	Mark
2(c)	1 mark for each correct answer. <ul style="list-style-type: none"> <li>allows constant rate of metabolism /respiration/A/W;</li> <li>ref. to enzyme optimum / A/W;</li> <li>animal can remain active in many climates;</li> </ul>	(2)

(Total 12 marks)

Question Number	Answer	Mark																					
3	<p>1 mark for each correct answer.</p> <table border="1"> <thead> <tr> <th>disease</th> <th>causative agent</th> <th>method of transmission</th> </tr> </thead> <tbody> <tr> <td><i>diphtheria</i></td> <td>bacterium;</td> <td><i>droplet infection</i></td> </tr> <tr> <td><i>typhus</i></td> <td><i>rickettsia</i></td> <td>vector / louse borne;</td> </tr> <tr> <td><i>malaria</i></td> <td>protozoan / Plasmodium;</td> <td>vector / mosquito;</td> </tr> <tr> <td><i>athlete's foot</i></td> <td>fungus / Tinea;</td> <td><i>contact with infected clothing, towels or floor</i></td> </tr> <tr> <td><i>poliomyelitis</i></td> <td>virus</td> <td>droplet infection;</td> </tr> <tr> <td><i>gonorrhoea</i></td> <td>bacterium</td> <td>sexual transmission / intercourse;</td> </tr> </tbody> </table>	disease	causative agent	method of transmission	<i>diphtheria</i>	bacterium;	<i>droplet infection</i>	<i>typhus</i>	<i>rickettsia</i>	vector / louse borne;	<i>malaria</i>	protozoan / Plasmodium;	vector / mosquito;	<i>athlete's foot</i>	fungus / Tinea;	<i>contact with infected clothing, towels or floor</i>	<i>poliomyelitis</i>	virus	droplet infection;	<i>gonorrhoea</i>	bacterium	sexual transmission / intercourse;	(7)
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(Total 7 Marks)

Question Number	Answer	Mark
4(a)(i)	<p>1 mark for each correct answer from any of the following - maximum 6 marks.</p> <ul style="list-style-type: none"> <li>• reasonable size diagram, at least 6 cm depth;</li> <li>• main bones drawn;</li> <li>• biceps and triceps muscles drawn, connected correctly at both ends;</li> <li>• forearm raised/bent at elbow;</li> <li>• biceps shown contracted (fatter);</li> <li>• triceps relaxed (long and thin);</li> <li>• tendons at same length as original;</li> </ul>	(6)

Question Number	Answer	Mark
4(a)(ii)	<p>1 mark for correct answer from any of the following - maximum 2 marks.</p> <ul style="list-style-type: none"> <li>• when biceps contracts;</li> <li>• transmits pull;</li> <li>• to the radius;</li> </ul>	(2)

Question Number	Answer	Mark
4(b)(i)	<p>1 mark for each correct answer.</p> <ul style="list-style-type: none"> <li>• Y - ball and socket / universal A/W;</li> <li>• Z - hinge;</li> </ul>	(2)

Question Number	Answer	Mark
4(b)(ii)	<p>1 mark for each correct answer from any of the following - maximum 4 marks.</p> <ul style="list-style-type: none"> <li>• Y - all round movement / eq;</li> <li>• Z - movement in one plane only / up to 180° /A/W;</li> </ul>	(2)



Question Number	Answer	Mark
4(c)(i)	<p>1 mark for each correct answer.</p> <ul style="list-style-type: none"> <li>• presence of synovial fluid / bones shaped to articulate with one another;</li> </ul>	(1)

Question Number	Answer	Mark
4(c)(ii)	<p>1 mark for each correct answer from any of the following - maximum 2 marks.</p> <ul style="list-style-type: none"> <li>• bones "scrape" against one another / increased friction;</li> <li>• movement painful;</li> <li>• movement may become almost impossible;</li> </ul>	(2)

(Total 15 Marks)

Question Number	Answer	Mark
5(a)(i)	1 mark for each correct answer.  <ul style="list-style-type: none"> <li>• A - Bowman's capsule;</li> <li>• B - glomerulus;</li> </ul>	(2)

Question Number	Answer	Mark
5(a)(ii)	1 mark for correct answer from any of the following - maximum 3 marks.  <ul style="list-style-type: none"> <li>• high blood pressure;</li> <li>• generated by heart;</li> <li>• narrowing of blood vessels increases pressure;</li> <li>• walls of glomerulus and capsule porous;</li> <li>• ultrafiltration / blood plasma forced out under pressure;</li> </ul>	(3)

Question Number	Answer	Mark
5(a)(iii)	1 mark for each correct answer from any of the following - maximum 2 marks  <ul style="list-style-type: none"> <li>• red blood cells;</li> <li>• white blood cells;</li> <li>• platelets;</li> <li>• <u>blood</u> proteins / <u>named</u> blood protein;</li> </ul> (ref to blood cells unspecified 1 mark)	(2)

Question Number	Answer	Mark
5(a)(iv)	1 mark for correct answer.  <ul style="list-style-type: none"> <li>• label G to first convoluted tubule;</li> </ul>	(1)

Question Number	Answer	Mark
5(b)(i)	<p>1 mark for each correct answer from any of the following - maximum 3 marks.</p> <ul style="list-style-type: none"> <li>• amount remaining in blood must be constant / osmoregulation / homeostasis / A/W;</li> <li>• input varies with diet;</li> <li>• input varies with amount drunk;</li> <li>• output varies due to sweating / activity;</li> <li>• depends on external temperature;</li> </ul>	(3)

Question Number	Answer	Mark
5(b)(ii)	<p>1 mark for each correct answer from any of the following - maximum 4 marks.</p> <ul style="list-style-type: none"> <li>• blood to the brain / hypothalamus monitored;</li> <li>• (pituitary) secretes ADH;</li> <li>• amount of ADH released depends on the water content of plasma;</li> <li>• ADH carried in blood;</li> <li>• to collecting duct (of nephron);</li> <li>• ADH stimulates water reabsorption;</li> <li>• the more ADH secreted - more water reabsorbed / ORA;</li> </ul>	(4)

(Total 15 Marks)

Question Number	Answer	Mark
6(a)(i)	1 mark for correct answer. <ul style="list-style-type: none"> <li>• B;</li> </ul>	(1)

Question Number	Answer	Mark
6(a)(ii)	1 mark for correct answer. Both needed for mark. <ul style="list-style-type: none"> <li>• F and G;</li> </ul>	(1)

Question Number	Answer	Mark
6(a)(iii)	1 mark for each correct answer. <ul style="list-style-type: none"> <li>• B to C/ from 1.9 -3.3 minutes;</li> </ul>	(1)

Question Number	Answer	Mark
6(b)	1 mark for each correct answer from any of the following - maximum 4 marks. <ul style="list-style-type: none"> <li>• ciliary muscles relax;</li> <li>• pressure from vitreous / aqueous humour pushes on sclera;</li> <li>• (suspensory) ligaments are pulled taut;</li> <li>• pull on lens;</li> <li>• lens flexible (jelly like) / elastic;</li> <li>• lens becomes less convex / thinner / flatter;</li> </ul>	(4)

(Total 7 Marks)

Question Number	Answer	Mark
7(a)(i)	1 mark for correct answer.  • R - tissue fluid;	(1)

Question Number	Answer	Mark
7(a)(ii)	1 mark for each correct answer from any of the following - maximum 2 marks.  • has no red blood cells in it; • has no <u>plasma</u> proteins in it; • not enclosed in vessels;	(2)

Question Number	Answer	Mark
7(b)(i)	1 mark for correct answer.  • 1 kPa; (unit required)	(1)

Question Number	Answer	Mark
7(b)(ii)	1 mark for correct answer.  • from the capillary to the tissue fluid / out from capillary / towards R / from S to R;	(1)

Question Number	Answer	Mark
7(b)(iii)	1 mark for each correct answer from any of the following - maximum 3 marks.  • substances diffuse; • into / out of muscle cells; • e.g. glucose (into); • oxygen (into); • waste substances / named example out of cells / into fluid;	(3)

Question Number	Answer	Mark
7(c)(i)	1 mark for correct answer. <ul style="list-style-type: none"> <li>• volume of liquid (in capillary) reduced / friction with capillary wall / A/W;</li> </ul>	(1)

Question Number	Answer	Mark
7(c)(ii)	1 mark for each correct answer from any of the following - maximum 2 marks. <ul style="list-style-type: none"> <li>• fluid is forced back into capillaries from R to T; R diffusion</li> <li>• fluid carries waste substances from the cells;</li> <li>• e.g. carbon dioxide;</li> </ul>	(2)

Question Number	Answer	Mark
7(d)(i)	1 mark for each correct answer. <ul style="list-style-type: none"> <li>• P - lymph;</li> </ul>	(1)

Question Number	Answer	Mark
7(d)(ii)	1 mark for each correct answer from any of the following - maximum 2 marks. <ul style="list-style-type: none"> <li>• (lymph) drains into lymph vessels;</li> <li>• lymph vessels / lymphatics join to form larger vessel;</li> <li>• passes through lymph nodes;</li> <li>• rejoins blood system (near heart)</li> <li>• ;</li> </ul>	(2)

(Total14 Marks)

Question Number	Answer	Mark
8(a)(i)	<p>1 mark for each correct answer.</p> <p>If candidate has used old nomenclature, penalise in 8(a)(i) and 8(a)(ii) only.</p> <ul style="list-style-type: none"> <li>• <math>I^A I^A</math> ;</li> <li>• <math>I^A I^O</math>;</li> </ul>	(2)

Question Number	Answer	Mark
8(a)(ii)	<p>1 mark for correct answer.</p> <ul style="list-style-type: none"> <li>• <math>I^A I^B</math>;</li> </ul>	(1)

Question Number	Answer	Mark
8(b)(i)	<p>1 mark for each correct answer. Accept any form of genetic diagram but labels / annotation necessary for each marking point.</p> <ul style="list-style-type: none"> <li>• parental genotypes <math>I^B I^O</math> <math>I^A I^B</math>;</li> <li>• gametes <math>I^B</math> <math>I^O</math> <math>I^A</math> <math>I^B</math>;</li> <li>• possible offspring <math>I^A I^B</math> <math>I^A I^O</math> <math>I^B I^B</math> <math>I^B I^O</math>; genotypes</li> <li>• possible offspring AB A B B; phenotypes</li> </ul>	(4)

Question Number	Answer	Mark
8(b)(ii)	<p>1 mark for correct answer.</p> <ul style="list-style-type: none"> <li>• 25%; accept ecf <math>\frac{1}{4}</math> / 1in4</li> </ul>	(1)

Question Number	Answer	Mark
8(c)	<p>1 mark for each correct answer from any of the following - maximum 4 marks.</p> <ul style="list-style-type: none"> <li>• males XY;</li> <li>• females XX;</li> <li>• heterozygous female / carrier does not show condition;</li> <li>• must be present on both X chromosomes to cause condition in females A/W;</li> <li>• if present (on single X chromosome) in male it causes condition;</li> </ul>	(4)

(Total 12 Marks)



Question Number	Answer	Mark
9(a)(i)	1 mark for each correct answer from any of the following - maximum 3 marks. <ul style="list-style-type: none"> <li>• bacteria (in plaque) act on / respire sugars;</li> <li>• release acid;</li> <li>• acid attacks / erodes / dissolves enamel;</li> <li>• allows entry / access by bacteria to dentine / living tissues;</li> </ul>	(3)

Question Number	Answer	Mark
9(a)(ii)	1 mark for each correct answer - maximum 2 marks <ul style="list-style-type: none"> <li>• brush teeth after eating / ref. to regular daily brushing;</li> <li>• using (fluoride) toothpaste / mouth wash dental floss;</li> <li>• regular visits to the dentist;</li> <li>• eat fibrous fruit / veg;</li> </ul>	(2)

Question Number	Answer	Mark
9(b)(i)	1 mark for each correct answer from any of the following - maximum 2 marks. <ul style="list-style-type: none"> <li>• cannot form new cytoplasm / cells;</li> <li>• poor growth / slow healing of wounds;</li> <li>• reduced immunity /A/W;</li> <li>• ref. to kwashiorkor;</li> </ul>	(2)

Question Number	Answer	Mark
9(b)(ii)	1 mark for correct answer from any of the following - maximum 2 marks. <ul style="list-style-type: none"> <li>• excess carbohydrates changed to fats;</li> <li>• excess fat stored around organs / under skin;</li> <li>• obesity;</li> <li>• extra mass to move around;</li> <li>• strain on muscles / heart / skeleton / increased risk of diabetes;</li> <li>• Increased risk of coronary heart disease;</li> </ul>	(2)

(Total 9 Marks)

(Total for paper: 100 marks)

7042/02 PAPER 2 MARK SCHEME - JUNE 2009

Question Number	Answer	Mark
1(a)	<p>1 mark for each correct answer from any of the following - maximum 4 marks.</p> <ul style="list-style-type: none"> <li>• chopping / grind food</li> <li>• put sample in a dry test tube;</li> <li>• add ethanol and shake;</li> <li>• decant the liquid;</li> <li>• add a drop of cold water;</li> <li>• cloudy / milky liquid confirms fat;</li> </ul>	(4)

Question Number	Answer	Mark
1(b)(i)	<p>1 mark for each correct answer from any of the following - maximum 5 marks.</p> <ul style="list-style-type: none"> <li>• alkaline conditions;</li> <li>• provided by pancreatic juice;</li> <li>• by bile;</li> <li>• fats emulsified;</li> <li>• lipase;</li> <li>• from pancreas;</li> <li>• digests / breaks fats into fatty acid and glycerol;</li> </ul>	(5)

Question Number	Answer	Mark
1(b)(ii)	<p>2 marks for each correct answer from any of the following pairs - maximum 3 marks.</p> <ul style="list-style-type: none"> <li>• in ileum;</li> <li>• via villi;</li> <li>• by diffusion;</li> <li>• into lacteal / lymph vessel;</li> <li>• joins blood near heart;</li> </ul>	(3)

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Question Number	Answer	Mark
1(c)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• fat layer (under skin);</li> <li>• provides insulation;</li> <li>• fat layer lost / used up if diet lacks fat;</li> <li>• more heat lost/AW;</li> <li>• loses source of energy from diet;</li> </ul>	(4)

Question Number	Answer	Mark
1(d)	<p>2 marks for each correct answer from any of the following pairs - maximum 4 marks.</p> <ul style="list-style-type: none"> <li>• electrical insulation;</li> <li>• around axons / dendrons of neurones;</li> <li>• energy store;</li> <li>• for use when body requires extra energy;</li> <li>• solvent for uptake of vitamins A and D;</li> <li>• allows them to pass across cell membranes;</li> <li>• component of cell membrane;</li> <li>• needed for formation of new cells;</li> <li>• protection of internal organs;</li> <li>• named organ / example;</li> </ul>	(4)

(Total 20 marks)

Question Number	Answer	Mark
2(a)(i)	<p>1 mark for each correct answer from any of the following - maximum 7 marks</p> <ul style="list-style-type: none"> <li>• two pumps (side by side) ;</li> <li>• each pump has two chambers /4 chambers altogether;</li> <li>• upper chamber / atrium receives blood;</li> <li>• lower chamber / ventricle pumps blood (by contraction);</li> <li>• deoxygenated blood into right side / in via vena cava;</li> <li>• pumped out to lungs;</li> <li>• (rbc) oxygenated in lungs;</li> <li>• via pulmonary artery;</li> <li>• oxygenated blood returns to left side/ atrium;</li> <li>• via pulmonary vein;</li> </ul>	(7)

Question Number	Answer	Mark
2(a)(ii)	<p>1 mark for each correct answer from any of the following - maximum 3 marks</p> <ul style="list-style-type: none"> <li>• valves between atria and ventricles/cuspid valves;</li> <li>• valves between ventricles and pulmonary artery / aorta semilunar valves;</li> <li>• fill up as pressure rises in ventricles / arteries;</li> <li>• close passageway to blood / prevent backflow;</li> </ul>	(3)

Question Number	Answer	Mark
2(a)(iii)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>oxygenated and deoxygenated blood may mix in heart;</li> <li>blood leaving left side/to body may not be fully oxygenated;</li> <li>muscles receive limited oxygen supply;</li> <li>less respiration occurs;</li> <li>less energy released;</li> <li>exercise difficult tire easily;</li> <li>lips / skin may develop a blue tinge;</li> </ul>	(4)

Question Number	Answer	Mark
2(b)	<p>1 mark for each correct answer from any of the following - maximum 3 marks.</p> <ul style="list-style-type: none"> <li>cardiac muscle involuntary but skeletal muscle voluntary;</li> <li>cardiac muscle does not fatigue but skeletal muscle does;</li> <li>skeletal muscle attached to bones but cardiac muscle not;</li> <li>cardiac muscle has one nucleus per cell but skeletal muscle has many nuclei scattered within fibre;</li> <li>any other valid difference;</li> </ul>	(3)

Question Number	Answer	Mark
2(c)	<p>1 mark for each correct answer from any of the following - maximum 3 marks</p> <ul style="list-style-type: none"> <li>not too much saturated fat - increases risk of heart attack;</li> <li>adequate protein - needed to maintain heart muscle;</li> <li>not too much salt - salt raises blood pressure;</li> <li>no or low alcohol intake - too much can damage heart;</li> <li>avoid too much caffeine - raises heart rate / blood pressure;</li> </ul>	(3)

(Total 20 marks)

Question Number	Answer	Mark
3(a)(i)	<p>1 mark for each correct answer from any of the following - maximum 8 marks</p> <ul style="list-style-type: none"> <li>• DNA (in nucleus) decides which protein is formed;</li> <li>• forms corresponding RNA;</li> <li>• passes out of nucleus;</li> <li>• to ribosomes;</li> <li>• in cytoplasm;</li> <li>• RNA "decoded" by ribosomes A/W;</li> <li>• Sequence of bases on RNA determines order of amino acids;</li> <li>• attract / collect correct amino acids;</li> <li>• arranged in a chain;</li> <li>• linked by peptide bonds;</li> <li>• to form protein / polypeptide;</li> <li>• amino acids arrive via endoplasmic reticulum/eq;</li> </ul>	<p>/</p> <p>(8)</p>

Question Number	Answer	Mark
3(a)(ii)	<p>1 mark for each correct answer.</p> <ul style="list-style-type: none"> <li>• some of the proteins formed used to make enzymes;</li> <li>• enzymes control chemical reactions in cell / speed up metabolism;</li> </ul>	<p>(2)</p>

Question Number	Answer	Mark
3(b)(i)	<p>1 mark for each correct answer from any of the following - maximum 3 marks</p> <ul style="list-style-type: none"> <li>• mitochondria contain enzymes;</li> <li>• bring about respiration;</li> <li>• releases energy;</li> <li>• ref. to ATP formation;</li> <li>• (energy) needed for protein formation;</li> <li>• and for mitosis;</li> </ul>	(3)

Question Number	Answer	Mark
3(b)(ii)	<p>1 mark for each correct answer from any of the following - maximum 7 marks. Accept annotations on diagrams</p> <ul style="list-style-type: none"> <li>• cell nucleus appears to become granular;</li> <li>• chromosomes appear;</li> <li>• become shorter and fatter;</li> <li>• nuclear membrane disappears;</li> <li>• each chromosome of two chromatids;</li> <li>• spindle appears;</li> <li>• chromosomes on equator of spindle;</li> <li>• chromatids pulled apart;</li> <li>• one of each pair move to each pole of cell;</li> <li>• two nuclear membranes appear;</li> <li>• cytoplasm divides;</li> </ul>	(7)

(Total 20 marks)



Question Number	Answer	Mark
4(a)(i)	<p>1 mark for each correct answer from any of the following - maximum 6 marks</p> <ul style="list-style-type: none"> <li>• diagram at least 8 cm long;</li> <li>• section to show wall thickness;</li> </ul> <p><u>correctly drawn and labelled-</u></p> <ul style="list-style-type: none"> <li>• ovary;</li> <li>• oviduct / fallopian tube;</li> <li>• uterus;</li> <li>• cervix;</li> <li>• vagina;</li> </ul>	(6)

Question Number	Answer	Mark
4(b)(i)	<p>1 mark for each correct answer from any of the following - maximum 7 marks</p> <ul style="list-style-type: none"> <li>• FSH begins maturation of ovum in follicle;</li> <li>• stimulates production of oestrogen;</li> <li>• oestrogen concentration rises / released at ovulation;</li> <li>• pituitary releases LH;</li> <li>• causes old follicle cells to release progesterone;</li> <li>• causes blood vessels to grow into uterus lining;</li> <li>• progesterone level falls / less produced;</li> <li>• leads to menstruation;</li> <li>• drop stimulates more FSH release / production;</li> </ul>	(7)

Question Number	Answer	Mark
4(b)(ii)	<p>1 mark for each correct answer from any of the following - maximum 3 marks</p> <ul style="list-style-type: none"> <li>• progesterone causes / maintains thickening of uterus lining;</li> <li>• increases vascularisation;</li> <li>• prevents further FSH production / ovulation;</li> <li>• at end of pregnancy oxytocin / other hormones;</li> <li>• initiate contractions/ birth;</li> </ul>	(3)

Question Number	Answer	Mark
4(c)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• (breast milk) contains all the materials needed for the baby;</li> <li>• in correct proportions for the baby;</li> <li>• milk transfers antibodies from mother to child;</li> <li>• ref. to colostrum;</li> <li>• breast milk normally uncontaminated by external pathogens;</li> <li>• forms mother - child bond;</li> </ul>	(4)

(Total 20 marks)

Question Number	Answer	Mark
5(a)	<p>1 mark for each correct answer from any of the following - maximum 8 marks. (mark points could be on labelled diagram)</p> <ul style="list-style-type: none"> <li>• airtight cavity;</li> <li>• bordered by ribs;</li> <li>• sternum;</li> <li>• backbone / thoracic vertebrae;</li> <li>• diaphragm;</li> <li>• contains heart and lungs;</li> <li>• intercostal muscles;</li> <li>• contract;</li> <li>• pull ribs up and outwards;</li> <li>• diaphragm flattens;</li> <li>• volume of cavity increases;</li> <li>• air enters via trachea and bronchi;</li> <li>•</li> </ul> <p>*Points 2-7 need description, not just name</p>	(8)

Question Number	Answer	Mark
5(b)(i)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• carbon dioxide levels in blood monitored / increases;</li> <li>• nerve impulses from medulla;</li> <li>• causes intercostal muscles / diaphragm muscles;</li> <li>• to contract more rapidly;</li> <li>• more strongly;</li> <li>• volume of thorax increases and decreases more rapidly;</li> <li>• greater gaseous exchange/ A/W;</li> </ul>	(4)

Question Number	Answer	Mark
5(b)(ii)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• exercise requires increased energy;</li> <li>• oxygen releases energy from glucose;</li> <li>• by respiration;</li> <li>• carbon dioxide released;</li> <li>• extra oxygen got from air in lungs;</li> <li>• extra carbon dioxide got rid of via air in lungs;</li> </ul>	(4)

Question Number	Answer	Mark
5(c)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• lactic acid formed;</li> <li>• limited energy released/A/W</li> <li>• ref. to build up of oxygen debt;</li> <li>• lactic acid build up;</li> <li>• causes muscle pain / cramp;</li> <li>• must be broken down using oxygen;</li> </ul>	(4)

(Total 20 marks)

Question Number	Answer	Mark
6(a)(i)	<p>1 mark for each correct answer.</p> <ul style="list-style-type: none"> <li>• clear outline at least 6cm long - NO nucleus; (1 mark)</li> </ul> <p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <p>Correctly shown and labelled:</p> <ul style="list-style-type: none"> <li>• nuclear / DNA thread;</li> <li>• cytoplasm;</li> <li>• membrane;</li> <li>• cell wall;</li> <li>• slime capsule;</li> <li>• plasmids / flagellum;</li> </ul>	(5)

Question Number	Answer	Mark
6(a)(ii)	<p>1 mark for each correct answer from any of the following - maximum 3 marks</p> <ul style="list-style-type: none"> <li>• parasitic / A/W;</li> <li>• saprophytic / A/W;</li> <li>• secrete enzymes to digest food;</li> <li>• absorb soluble products;</li> <li>• some bacteria are photosynthetic / autotrophic;</li> <li>• Correct ref to bacteria in nitrogen cycle;</li> </ul>	(3)

Question Number	Answer	Mark
6(b)(i)	<p>1 mark for each correct answer from any of the following - maximum 2 marks</p> <ul style="list-style-type: none"> <li>• via droplet infection;</li> <li>• patient coughs / breathes out droplets;</li> <li>• inhaled by uninfected person;</li> <li>• drinking infected milk;</li> </ul>	(2)

Question Number	Answer	Mark
6(b)(ii)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• (early detection) to prevent major damage to lungs;</li> <li>• prevent spread of infection to other parts of the body;</li> <li>• rest / no stress;</li> <li>• good diet;</li> <li>• use of antibiotics;</li> <li>• e.g. streptomycin;</li> <li>• use of other drugs (chemical);</li> <li>• isolation of patient;</li> </ul>	(4)

Question Number	Answer	Mark
6(c)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• improved living conditions / less overcrowding;</li> <li>• improved diet;</li> <li>• introduction of antibiotics;</li> <li>• mass testing / X rays / screening techniques;</li> <li>• pasteurisation of milk / TT cows;</li> <li>• vaccination;</li> </ul>	(4)

Question Number	Answer	Mark
6(d)	<p>1 mark for each correct answer from any of the following - maximum 2 marks</p> <ul style="list-style-type: none"> <li>• breakdown of social conditions / wars etc;</li> <li>• rapid travel, spread of infection / infecting people is easier;</li> <li>• antibiotic resistant strains of bacterium developed / A/W;</li> </ul>	(2)

(Total 20 marks)

Question Number	Answer	Mark
7(a)(i)	<p>1 mark for each correct answer from any of the following - maximum 8 marks</p> <p>Many of these points could be as annotations on a diagram or as a paragraph</p> <ul style="list-style-type: none"> <li>• diagram to show three layers;</li> <li>• living structures in middle layer;</li> <li>• fat layer provides insulation;</li> <li>• dead/ cornified layer waterproof;</li> <li>• Malpighian layer produces new cells;</li> <li>• (Malpighian layer produces) melanin gives protection against UV light;</li> <li>• hair follicles produce hairs;</li> <li>• sebaceous gland alongside shaft of hair;</li> <li>• waterproof hair / secrete sebum;</li> <li>• sweat glands to reduce temperature;</li> <li>• capillaries;</li> <li>• nerve endings - sensitive to touch / temperature;</li> </ul>	(8)

Question Number	Answer	Mark
7(a)(ii)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• no gaps in outer layer;</li> <li>• difficult for pathogens to gain entry;</li> <li>• outer layer waterproof;</li> <li>• barrier against many chemicals;</li> <li>• sebum from gland is antiseptic;</li> </ul>	(4)

Question Number	Answer	Mark
7(b)(i)	<p>1 mark for each correct answer from any of the following - maximum 5 marks</p> <ul style="list-style-type: none"> <li>• ciliated epithelium;</li> <li>• with cells that secrete mucus;</li> <li>• mucus traps pathogens / dust;</li> <li>• cilia beat in sequence;</li> <li>• push mucus away from lungs / towards throat;</li> <li>• mucus is swallowed;</li> </ul>	(5)

Question Number	Answer	Mark
7(b)(ii)	<p>1 mark for each correct answer from any of the following - maximum 3 marks</p> <ul style="list-style-type: none"> <li>• smoke is irritant;</li> <li>• nicotine;</li> <li>• paralyses cilia;</li> <li>• may destroy them;</li> <li>• particles and tar not removed;</li> <li>• accumulation of mucus;</li> <li>• bronchitis;</li> <li>• tar linked to increase in cancers of the airways;</li> </ul>	(3)

(Total 20 marks)



Question Number	Answer	Mark
8(a)(i)	<p>1 mark for each correct answer - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• bacteria;</li> <li>• fungi;</li> <li>• saprophytic nutrition;</li> <li>• release / secrete enzymes;</li> <li>• cellulase;</li> <li>• breakdown / digest cell walls / cellulose;</li> <li>• release cell contents;</li> </ul>	(4)

Question Number	Answer	Mark
8(a)(ii)	<p>1 mark for each correct answer - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• reasonable temperature;</li> <li>• enzymes / microorganisms only active at suitable temperature /pH;</li> <li>• presence of water / damp conditions;</li> <li>• as reactant / as medium for chemical reactions;</li> <li>• oxygen;</li> <li>• respiration of bacteria / fungi;</li> <li>• suitable pH;</li> </ul>	(4)

Question Number	Answer	Mark
8(a)(iii)	<p>1 mark for each correct answer - maximum 3 marks</p> <ul style="list-style-type: none"> <li>• recycling A/W;</li> <li>• materials removed from environment;</li> <li>• by plants etc;</li> <li>• e.g. nitrate;</li> <li>• released by decay;</li> <li>• returned to soil /air;</li> </ul>	(3)

Question Number	Answer	Mark
8(b)	<p>Any three examples - 3 marks each (1 for method and 2 for explanation)- maximum 9 marks</p> <ul style="list-style-type: none"> <li>• dehydration / drying;</li> <li>• water removed;</li> <li>• microorganisms inactivated;</li>   <li>• salting / syrup;</li> <li>• osmotic method</li> <li>• water made unavailable to microorganisms;</li>   <li>• refrigeration / freezing;</li> <li>• low temperature / removes heat;</li> <li>• enzymes inactivated;</li> <li>• microorganisms cannot reproduce / metabolise;</li>   <li>• canning;</li> <li>• food heated - microorganisms killed;</li> <li>• can sealed - no more microorganisms can enter / no entry of oxygen;</li>   <li>• vacuum packing;</li> <li>• contents lack oxygen / air;</li> <li>• microorganisms killed or inactivated;</li>   <li>• radiation;</li> <li>• food in sealed container;</li> <li>• irradiated;</li> <li>• microorganisms killed;</li> </ul>	(9)

(Total 20 marks)

Question Number	Answer	Mark
9(a)(i)	<p>1 mark for each correct answer from any of the following - maximum 8 marks. Accept points if explained on diagram. * Can be awarded on equation</p> <ul style="list-style-type: none"> <li>• photosynthesis / autotrophic nutrition;</li> <li>• * carbon dioxide + water;</li> <li>• chlorophyll;</li> <li>• light energy absorbed;</li> <li>• * glucose formed;</li> <li>• * oxygen released;</li> <li>• glucose basis for other food materials;</li> <li>• e.g. starch / fats / proteins;</li> <li>• oxygen removed from atmosphere for respiration;</li> <li>• replaced as result of photosynthesis;</li> <li>• animals depend on plants for nutrition;</li> </ul>	(8)

Question Number	Answer	Mark
9(a)(ii)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• carbon dioxide removed by photosynthesis;</li> <li>• replaced by respiration;</li> <li>• by combustion use of fossil fuels;</li> <li>• oxygen removed by respiration / combustion;</li> <li>• these processes roughly balance out;</li> </ul>	(4)

Question Number	Answer	Mark
9(b)(i)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• increased combustion of fossil fuels;</li> <li>• increased energy demand in homes / industry;</li> <li>• increased use of vehicles;</li> <li>• original carbon dioxide removal over millions of years;</li> <li>• replaced over a very short time;</li> <li>• effects of deforestation;</li> <li>• increased population, more respiration;</li> </ul>	(4)

Question Number	Answer	Mark
9(b)(ii)	<p>1 mark for each correct answer from any of the following - maximum 4 marks</p> <ul style="list-style-type: none"> <li>• combines with haemoglobin/ forms carboxyhamoglobin;</li> <li>• irreversible;</li> <li>• reduces oxygen transport in body;</li> <li>• less oxygen for respiration / energy release;</li> <li>• death;</li> <li>• ref. effect on fetus;</li> </ul>	(4)

(Total 20 marks)

(Total for paper: 100 marks)

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