

GCSE 2004

June Series



Mark Scheme

Human Physiology and Health (3417/F)

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Question 1

question	answers	extra information	mark
(a)	A – (cell) membrane B – cytoplasm C – nucleus		1 1 1
(b)	any one from glucose amino acids vitamins / named minerals / named hormones / named	do not accept oxygen do not accept food accept proteins	1
(c)(i)	<u>respiration</u>		1
(ii)	<u>plasma</u>		1
(iii)	diffusion from high concentration to low concentration		1 1
total			8

Question 2

question	answers	extra information	mark
(a)	<u>trachea</u>	this order only	1
	<u>bronchioles</u>		1
(b)	<i>The answer to this question requires a minimum of two linked ideas in a sensible order.</i>		1
	<p>any four from</p> <p>diaphragm muscles</p> <p>diaphragm moves down / falls / lowers</p> <p>contraction from either diaphragm or contracts once only</p> <p>intercostal muscles / rib muscles</p> <p>ribs move up</p> <p>volume increases or more space in the lungs / thorax</p> <p>pressure falls</p>		4
(c)	<p>any two from</p> <p>thin or one cell thick</p> <p>large (surface) area</p> <p>good blood supply</p> <p>moist</p>		2
total			9

Question 3

question	answers	extra information	mark
(a)	nerves		1
	spinal cord		1
(b)(i)	A – cornea		1
	B – lens		1
(ii)	(nerve) impulses	do not accept message / images accept electrical signals / information	1
	unable to reach brain		1
(c)(i)	reflex		1
(ii)	light		1
total			8

Question 4

question	answers	extra information	mark
(a)(i)	5 correct plots = 2 marks 3 or 4 correct plots = 1 mark	+ / - half square	2
(ii)	legend completed to match bar chart		1
(iii)	China		1
(iv)	(birth rate) 28 and (death rate) 10 (population) increases		1 1
(b)	(effect) population increases any two from (reason) fewer deaths from diseases / less deaths more children survive to have children		1 1 1
total			9

Question 5

question	answers	extra information	mark
(a)(i)	1994		1
(ii)	fall		1
(b)(i)	any two from breath in / through lungs in food or water / through digestive system skin absorption / through skin via placenta		2
(ii)	any two from nervous system / nerves / brain muscles connective tissue blood / red cells lungs		2
(iii)	destroys activity any one from less haemoglobin available or less oxyhaemoglobin can be formed less oxygen is carried to cells anaemia / tiredness / lethargy		1 1
(c)	any two from sulphur dioxide carbon monoxide nitrous oxides carbon dioxide methane smoke cfcs	accept symbols	2
total			10

Question 6

question	answers	extra information	mark
(a)	vagina or urethra (of the male)	in this order	1
	ovary		1
	testes		1
	urethra		1
	oviduct		1
(b)(i)	97.5 (%)		1
(ii)	diaphragm and intra-uterine device	both required	1
(iii)	cutting and tying sperm ducts		1
	sperm unable to leave male body / no sperm for fertilisation	do not accept no sperm produced	1
total			9

Question 7

question	answers	extra information	mark
(a)(i)	1850 (cm ³)		1
(ii)	10 (%)	correct substitution scores 1 correct answer scores 1	2
(iii)	any two from skin lungs kidneys / bladder large intestine / colon / rectum	accept gut	2
(b) (i)	increase		1
(ii)	keeps body temperature at 37°C or keeps body temperature constant or cools body or loses heat		1
total			7

Question 8

question	answers	extra information	mark
(a)(i)	fungus		1
	bacterium		1
	virus		1
	protozoan / protoctistan		1
(ii)	malaria		1
(b)	(stomach) produces acid		1
	acid kills pathogens		1
	(respiratory passages) mucus traps pathogens		1
	cilia 'sweep' mucus / pathogens (up to throat or out of lungs)	ignore nasal hair	1
total			9

Question 9

question	answers	extra information	mark
(a)	teeth	accept muscles or muscle action in stomach / stomach	1
(b)	peristalsis or description		1
(c)	large / insoluble molecules		1
	broken down to small / soluble molecules		1
	by enzymes	accept named example of enzyme	1
(d)(i)	ileum / small intestine / villi		1
(ii)	any two from small molecules diffuse (from intestine) to blood / into blood	accept named examples	2
(e)	(hepatic) portal vein		1
(f)(i)	as energy source / respiration		1
(ii)	to make protein / enzymes / named example	do not accept growth and repair	1
total			11

Question 10

question	answers	extra information	mark
(a)	mass of abnormally (arranged) / mutated cells		1
	which multiply at random / uncontrolled division		1
(b)	any two from UV radiation X-rays / gamma rays carcinogens / example asbestos	allow radiation if no other named example accept smoking / tar do not accept nicotine	2
(c)	cancerous cells break off carried in blood (to other organs)		1
			1
(d)(i)	lung cancer		1
(ii)	stomach		1
(iii)	78 (%)		1
(iv)	any two from better self awareness earlier diagnosis / screening better treatment / easier to treat		2
(v)	high-fibre diet		1
total			12

Question 11

question	answers	extra information	mark
(a)(i)	B		1
(ii)	D		1
(b)	Graph 1 (no mark) no intermediate values /only 2 separate values		1
(c)(i)	a form of a gene		1
(ii)	parents Ff and Ff	accept ecf for maximum 2 marks	1
	gametes F f F f		1
	F1 genotype FF fF fF ff		1
	child ff identified		1
total			8

Question 12

question	answers	extra information	mark
(a)	any two from to remove pathogens to remove toxic chemicals to make clear		2
(b)	<i>The answer to this question requires a minimum of two technical terms used in correct context for Quality of Written Communication mark.</i> any three from screened to remove debris / rubbish sedimentation / settling to remove (inorganic) particles filtered to remove microorganisms / organic matter chlorinated to kill pathogens / microorganisms storage in dark to prevent growth of algae		1 3
total			6

Question 13

question	answers	extra information	mark
(a)	A – cartilage B – synovial fluid		1 1
(b)	(strong) prevents dislocation (slightly elastic) (stretches) to allow movement		1 1
(c)(i)	less bone / bone is thinner more cavities in bone / number of cavities increased		1 1
(ii)	bones more brittle / weaker / more easily broken	do not accept references to effects on the spine or height	1
(d)(i)	allow surgeon to explore joint / assess damage allow instruments to reach damaged part of joint		1
(ii)	to prevent infection		1
(iii)	any two from faster recovery time less scar tissue / less tissue damage shorter hospital stay other valid reasons local anaesthetic rather than general anaesthetic	ignore references to cost / stress	2
(e)	any three from non-allergenic / non-reactive strong / tough smooth / friction free long-lasting rustproof		3
total			14