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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Human Physiology & Health 3417/F

Mark Scheme

2006 examination - June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Human Physiology & Helath
Foundation Tier 3417/F

3417/F Q1

question	answers	extra information	mark
(a)	28 weeks	units required	1
(b)	70 (grams per week)	accept substitution into formula for **1** mark	2
(c)(i)	any **two** from: • glucose • amino acids • minerals • vitamins • fatty acids • glycerol	do **not** accept antibodies accept named example accept named example	2
(ii)	any **one** from: carbon dioxide urea		1
(iii)	diffusion / active transport	accept a definition	1
total			7

3417/F Q2

question	answers	extra information	mark
(a)(i)	carbohydrate / starch		1
(ii)	0.7 x 4.5 = 3.15	correct answer scores 2 allow 1 mark for correct working if answer incorrect	2
(b)(i)	add benedict's heat / boil / warm		1 1
(ii)	green / yellow / orange / red / brown colour		1
(c)(i)	sugars	accept maltose / named sugar do **not** accept glucose	1
(ii)	fatty acids glycerol		1 1
(d)(i)	any **three** from: • (food molecules) are too large • are insoluble • need to be broken down • for absorption / to pass through cell membrane / diffusion • into blood		3
(ii)	helps movement of food through intestines / prevents constipation	do **not** accept references to prevents cancer	1
total			13

3417/F Q3

question	answers	extra information	mark
(a)(i)	wheat		1
(ii)	traps Sun's energy / photosynthesis	do **not** accept begins food chain	1
	provides food / energy for other organisms		1
(iii)	frogs		1
(b)	P		1
(c)	energy is used / lost / wasted by each organism		1
	in waste materials		1
	as heat to environment		1
	part of body not eaten		1
(d)	rot / decay / decompose		1
	(action of) decomposers / bacteria / fungi		1
total			11

3417/F Q4

question	answers	extra information	mark
(a)(i)	prevents backflow of blood		1
(ii)	L – K – J – M	4 correct = 3 2 or 3 correct = 2 1 correct = 1	Max 3
(b)	pulmonary vein renal artery coronary artery		1 1 1
(c)	**Quality of written communication** any **four** from: • (too much) saturated fat / cholesterol • blockage / artery narrowed • atheroma • reduced space for blood • slower / reduced blood flow • increased blood pressure • less oxygen / sugar to heart <u>muscle</u> • strain on heart / heart has to work harder • heart <u>muscle</u> dies	use of any 2 technical terms in correct context e.g. cholesterol, pressure, atheroma, oxygen, muscle, sugar.	1 4
total			12

3417/F Q5

question	answers	extra information	mark
(a)(i)	(chromosome) 1		1
(ii)	(chromosome) 13		1
(iii)	(chromosome) 4		1
(b)	genotype (the genetic make-up of a person)		1
	allele (a form of a gene)		1
	phenotype (the expression of a gene)		1
(c)	(parents) Ee Ee		1
	(gametes) E e E e		1
	(offspring) EE Ee Ee ee		1
	affected child identified	accept correctly derived gametes / children from previous stage	1
total			10

3417/F Q6

question	answers	extra information	mark
(a)(i)	C		1
(ii)	B		1
(iii)	A		1
(b)	C / nucleus		1
(c)(i)	heart		1
(ii)	kidney		1
(iii)	lung		1
total			7

3417/F Q7

question	answers	extra information	mark
(a)(i)	- (minus) 76%		1
(ii)	1991 and 1993		1
(iii)	no data for some years / limited time range / no data for intermediate years no data for other substances / named substance		1 1
(iv)	any **two** from: • increased demand by industry / more factories / machinery • increase in population / more homes built • increased use in heating / lighting /cooking / domestic use • increase in car / transport use		2
(b)	methane carbon dioxide		1 1
(c)	reduction of / damage to ozone layer OWTTE exposed to UV radiation		1 1
total			10

3417/F Q8

question	answers	extra information	mark
(a)(i)	sterilisation kills <u>all</u> bacteria / spores		1
	pasteurisation kills most bacteria / some remain / some spores remain		1
	these grow / reproduce / multiply (and sour milk)		1
(ii)	**Quality of written communication**	any 2 points in correct sequence	
	(idea of) raw meat contains bacteria / bacteria falls on meat	annotate as Q ✓ **or** Q ×	1
	not killed in freezer		1
	reproduce during defrosting		1
	cooking kills bacteria		1
	prevents food poisoning		1
(b)	bacteria left on / transferred to work surface (from raw chicken)	accept converse argument	1
	bacteria picked up / transferred to cooked chicken		1
	bacteria reproduce		1
	(cooked chicken) eaten without cooking / has already been cooked		1
total			12

3417/F Q9

question	answers	extra information	mark
(a)	abnormal / uncontrolled growth (of cells)	ignore 'rapid'	1
(b)	any **two** from: • asbestos • distillation products of fossil fuels • UV • X-rays • gamma rays / ionising • mutation • lack of fibre	accept radiation for 1 mark accept any other valid carcinogen	2
(c)(i)	34 439		1
(ii)	died (on average about) 10 years younger	accept converse argument	1
(ii)	(30) 10 years (50) 6 years		1 1
(iv)	42%		1
(d)(i)	35 or 36		1
(ii)	50		1
total			10

3417/F Q10

question	answers	extra information	mark
(a)	stomach		1
	ileum / small intestine	accept duodenum do **not** accept 'intestine' unqualified	1
(b)(i)	30 to 40°C	ignore refs to body / optimum temperature do **not** accept warm	1
(ii)	(pH) 4		1
(iii)	protease / enzyme digests / breaks down (protein)		1
	to amino acids		1
total			6

3417/F Q11

question	answers	extra information	mark
(a)	any **two** from: • growth / repair / cell division • maintenance of body temperature / keeping warm • movement / muscle contraction • reproduction	accept 'active transport'	2
(b) (i)	glucose water	ignore 'sugar'	1 1
(ii)	in plasma		1
(c)(i)	2500 (cm^3)		1
(ii)	0 – 1 (seconds)		1
(iii)	30		1
total			8

3417/F Q12

question	answers	extra information	mark
(a)(i)	**A** – cerebrum / cerebral hemisphere / cerebral cortex **B** – cerebellum **D** – pituitary (gland)		1 1 1
(ii)	controls heart rate / breathing rate / involuntary actions / choking / swallowing etc		1
(b)	any **two** from: • rapid • automatic / involuntary / without thought • response (to a stimulus)		2
(c)(i)	sensory / afferent		1
(ii)	synapse		1
(iii)	muscle **or** gland		1
total			9

3417/F Q13

question	answers	extra information	mark
(a)	(eggs) ovaries		1
	(sperm) testes		1
(b)(i)	any **two** from: • suitable temperature / body temperature / warm • suitable pH (6-7) • oxygen • nutrients / energy from food • suitable concentrations of / right amount of nutrients • sterile	accept ***one*** named example accept 'clean' if qualified	2
(ii)	some eggs may be damaged / some may die during process / increased chance of <u>fertilisation</u> or definition	do **not** accept 'more successful' unless qualified	1
total			5