



General Certificate of Secondary Education

Human Physiology & Health 3417/F

Mark Scheme

2005 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 & Health

Foundation Tier 3417/F

3417/F Q1

question	answers	extra information	mark
	eye		1
	kidney		1
	heart		1
	skin		1
	nucleus		1
total			5

3417/F Q2

question	answers	extra information	mark
(a)	(P) glycogen		1
	(Q) carbon dioxide / water	in either order	1
	(R) water / carbon dioxide		1
	(S) lactic acid	accept symbols	1
(b)	any one from: <ul style="list-style-type: none"> movement / exercise growth / repair keeping warm metabolism description 		1
total			5

3417/F Q3

question	answers	extra information	mark
(a)(i)	(NN) no (nn) yes	both required	1
(ii)	mother and father	both required	1
(b)	different sex		1
	different genes / alleles / genetic makeup		1
total			4

3417/F Q4

question	answers	extra information	mark
(a)	3.1 (million tonnes)		1
(b)	4.1 (million tonnes)		1
(c)	1995 <u>and</u> 2000	both required	1
(d)	any one from: <ul style="list-style-type: none"> • carbon dioxide • carbon monoxide • nitrous oxides • methane • lead 	accept symbols accept sensible suggestion of <u>chemical</u> pollutant	1
total			4

3417/F Q5

question	answers	extra information	mark
(a)	(sun)light	accept sun	1
(b)	tiny plants → tiny animals (left side)		1
	(oysters) → humans (right side)		1
(c)(i)	whales or oysters		1
(ii)	tiny animals		1
(d)	whelks		1
(e)	arrow from mussels to humans	mussels added to diagram anywhere – no mark	1
	arrow from tiny plants to mussels	-1 mark for each additional arrow	1
(f)	as heat		1
total			9

3417/F Q6

question	answers	extra information	mark
(a)	(vein) has less muscle and elastic tissue or (artery) has more muscle and elastic tissue		1
	(vein) has wider lumen or (artery) has narrower lumen		1
	(vein) fibrous layer is thinner / smaller or (artery) fibrous layer is thicker		1
(b)	any one from: <ul style="list-style-type: none"> veins have valves or arteries do not have valves veins carry blood <u>from</u> the organs or <u>to</u> the heart or arteries carry blood <u>to</u> the organs or <u>away</u> from the heart higher pressure in arteries or lower pressure in veins 		1
(c)(i)	fatty deposit		1
(ii)	oxygen	in either order	1
	glucose		1
(iii)	heart attack / cardiac arrest / heart stops / no O ₂ glucose to heart <u>muscle</u>		1
(d)(i)	pulmonary artery		1
(ii)	any one from: <ul style="list-style-type: none"> B has more oxygen / is more oxygenated or A has less oxygen / is deoxygenated B has less carbon dioxide or A has more carbon dioxide blood in B is at greater pressure or blood in A is at less pressure 		1
total			10

3417/F Q7

question	answers	extra information	mark
(a)	bacteria		1
	fungi		1
	protoctistans		1
(b)	reproduce (rapidly) in the body		1
	produce toxins (poisons)		1
(c)	<p>any six from:</p> <ul style="list-style-type: none"> • storage to prevent growth of microbes • storage to prevent vectors • references to cross contamination • personal hygiene • environmental hygiene • food management 	<p>eg refrigeration</p> <p>eg covering food, wrapping food</p> <p>eg storing cooked and raw food separately</p> <p>eg hair nets</p> <p>eg clean surfaces etc</p> <p>eg 'use by' dates and thawing of food</p>	6
total			11

3417/F Q8

question	answers	extra information	mark
(a)(i)	produces eggs / produces (named) hormones	accept stores eggs accept releases eggs	1
(ii)	produces sperm / produces (named) hormones	accept stores sperm	1
(b)	eggs and sperm fuse / join together to form zygote	do not accept meet or come together ignore 'penetrate'	1 1
(c)	placenta uterus (wall)	 accept muscle	1 1
(d)	any one from: <ul style="list-style-type: none"> protects embryo from shocks / knocks supports embryo protects embryo from infection constant temperature 		1
(e)	Quality of written communication any four from: <ul style="list-style-type: none"> (amino acids) formed from digestion / breakdown of protein absorbed into mother's blood (carried in maternal blood) to placenta diffuses into fetal blood 	correct linking of ideas (at least 2) in correct context	1 4
total			12

3417/F Q9

question	answers	extra information	mark
(a)(i)	35 g		1
(ii)	carbohydrate	accept sugar ignore named sugar	1
(iii)	contains less than 10 g / less than one portion	accept skimmed milk	1
(b)	water		1
(c)(i)	to absorb calcium (from food)	do not accept references to effects of deficiencies	1
(ii)	for production of <u>haemoglobin</u>	do not accept references to effects of deficiencies	1
total			6

3417/F Q10

question	answers	extra information	mark
(a)(i)	3		1
(ii)	large increase or increased from 12 000 to 23 000 or by 11 000		1
	lack of vaccination or measles epidemic or new strain / mutation		1
(b)	any three from: <ul style="list-style-type: none"> white blood cells / lymphocytes / leucocytes produce antibodies (antibodies) destroy pathogen correct reference to immunological memory / memory cells 	accept correct description of antibody action do not accept 'infection'	3
(c)(i)	injection / giving of antibodies	ignore vaccination on its own	1
(ii)	immediately / shortly after exposure to an infective organism	accept named examples eg bitten by rabid dog	1
total			8

3417/F Q11

question	answers	extra information	mark
(a)	3	accept at 35 degrees	1
(b)	<u>enzyme</u> denatured (by high temperature)	do not accept killed	1
(c)(i)	sugar	accept glucose / maltose	1
(ii)	use Benedict's solution		1
	heat / boil	accept description of result	1
(d)(i)	(B) - where most chemical reactions take place		1
	(C) - controls the <u>activities</u> of the cell	ignore 'brain of cell'	1
(ii)	absorption	accept diffusion accept active transport / uptake	1
(iii)	increases surface area (for absorption)	accept large surface area	1
total			9

3417/F Q12

question	answers	extra information	mark
(a)	no bacteria growing near the mould		1
(b)	mould was producing a substance / Penicillin		1
	which stopped growth of or killed bacteria		1
(c)	produced a <u>pure</u> culture of the mould (growing in broth)		1
	added broth to culture(s) of bacteria	accept idea of adding mould to bacteria	1
(d)	(broth / Penicillin) killed the bacteria		1
(e)	to find out if safe (on humans) OWTTE	accept testing the effectiveness in animals	1
total			7

3417/F Q13

question	answers	extra information	mark
(a)(i)	seven correct plots points joined by (smooth) curve	-1 mark for each incorrect plot	3 1
(ii)	35°C	accept 35	1
(iii)	<u>enzymes</u> (involved) in blood clotting most active at this temperature or is optimum temperature	do not accept references to body temperature	1
(iv)	from 5 to 35°C time decreases from 35 to 50°C time increases		1 1
(b)	clotting prevents <u>pathogens entering</u> body	accept usual alternatives for pathogens ignore 'disease entering'	1
total			9

3417/F Q14

question	answers	extra information	mark
(a)	any two from: <ul style="list-style-type: none"> • supports the body • maintenance of upright posture • protects (vital) <u>organs</u> • (allows) movement / muscle attachment 	accept production of red/white blood cells accept stores calcium	2
(b)(i)	cartilage		1
(ii)	ligament		1
(iii)	tendon		1
(c)	muscles contract to pull <u>bones</u> biceps causes bending / flexion triceps causes straightening / extension reference to antagonistic <u>action</u> or description		1 1 1 1 1
total			10

3417/F Q15

question	answers	extra information	mark
(a)	rib	do not accept rib cage	1
	bronchus	accept bronchi do not accept bronchioles	1
	alveolus	accept alveoli	1
(b)	Quality of written communication	correct use of at least 2 scientific terms in correct context eg contract, volume, pressure, thorax	1
	any four from: <ul style="list-style-type: none"> intercostals muscles and diaphragm contract rib cage <u>moves</u> up / out diaphragm moves down or flattens volume of chest cavity increases pressure falls 	do not accept expansion accept thoracic cavity / lungs	4
(c)	mucus traps (dust and microorganisms)		1
	cilia sweep / move (mucus and micro-organisms and dust) up / out (of lungs) / to throat		1
(d)	more air to enter / leave lungs OWTTE		1
total			11