

JUNE 2002

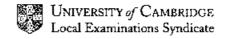
GCE Advanced Subsidiary Level

MARK SCHEME

MAXIMUM MARK: 60

SYLLABUS/COMPONENT:9700/2

BIOLOGY (STRUCTURED QUESTIONS (AS))



Page 1	Mark Scheme	Syllabus	Paper
	AS Level Examinations - June 2002	9700	2

Question	Expected Answers	Marks
1 (a)	M between zygote and young seaweed / between young seaweed and adult;	1
(b)	each chromosome contains two <u>chromatids</u> ; (genetically) identical / exact replica; daughter cells receive a copy of, each chromosome / DNA molecule / same genetic material / AW;	2 max
(c)	each strand / polynucleotides, acts as a template / sense strand; for complementary, strand / polynucleotides / nucleotides / bas pairing; new DNA contains half old, half new;	
(d)	reduction division; gametes / sex cells / eggs and sperms, have half the chromoson number / haploid / n; zygote is diploid / has full number of chromosomes / 2n; chromosome number remains the same / does not increase with each generation;	ne 3 max

[Total: 8]

Page 2	Mark Scheme	Syllabus	Paper
	AS Level Examinations June 2002	9700	2

Question	Expected Answers	Marks
2 (a)	all hydrogen peroxide broken down / no substrate left / substrate limiting;	1
(b)	Line below that at 20°C may reach same plateau or heading towards it;	1
(c)	no reaction / very little oxygen / gas collected / no oxygen / gas collected; (1 mark)	
	max 2 for explanation	
	catalase / enzyme, denatured;	
	loss of tertiary structure / conformation / folding / shape / active site changes;	e
	breakage of bonds;	
	named bonds (hydrogen, ionic);	
	substrate no longer fits active site / no enzyme substrate complex formed;	3 max
(d)	repeat using different concentrations of hydrogen peroxide / substrate;	
	ref to (suitable) range / details of concentrations;	
	fresh solution of catalase / enzyme each time;	
	same concentration of catalase / enzyme;	
	same temperature / same pH;	
	repeat readings / replicates; calculate initial rate;	
	method (e.g. volume in 15 seconds / gradient);	4 max

[Total: 9]

Page 3	Mark Scheme	Syllabus	Paper
	AS Level Examinations – June 2002	9700	2

Question	O	Expected Answers	Marks
3 (a)	(i)	phospholipid;	1
	(ii)	glycerol; 2 fatty acid(s) / hydrocarbon(s) (tails / chains); phosphate;	3
	(iii)	<u>phospholipids</u> are, fluid / liquid / move about / diffuse within own monolayer; <u>proteins</u> (are separate pieces) 'floating' / moving about in liquid / AW; ref to pattern / arrangement of proteins;	i 2 max
(b)		variable region / AW; different / particular, sequences of amino acids / primary structudifferent, (3D) shapes / conformation / folding / tertiary structuref to R groups / side chains; complementary to / matches shape of antigen(s);	

[Total: 9]

Page 4	Mark Scheme	Syllabus	Paper
	AS Level Examinations – June 2002	9700	2

Question	Expected Answers	Marks	
4 (a)	ventricle contracts / ventricular systole;		
	blood forced through semi-lunar valve;		
	into aorta;	_	
	atrio-ventricular / bicuspid / mitral valve closed;	2 max	
(b)	ref to unidirectional valves / valves prevent backflow;		
	blood pressure greater on one side of valve than the other;		
	atrial systole / contraction forces open atrio-ventricular / bicus; / mitral valve;	pid	
	ventricular systole / contraction closes atrio-ventricular / bicusp / mitral valve;	oid	
	semi-lunar valve opens (in context of ventricular systole);		
	semi-lunar valve closes (after ventricular systole);		
	ref to role of tendons;		
	ref to role of papillary muscles;	3 max	
(c)	(pressure falls to zero because) all blood expelled from ventricl	le	
	/ ventricle completely empties / AW;		
	(blood pressure falls to 10kPa) because elastic fibres qualified	1	
	elasticity of arteries / elastic recoil; ref to smooth muscles qualified;		
	narrow diameter of capillaries / arterioles / small arteries;		
	resistance to flow;	3 max	
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(d)	nicotine causes constriction of blood vessels;		
	nicotine raises, blood pressure / heart rate;		
	<u>nicotine</u> causes blood platelets to become 'sticky' forming blockage / 'clot';		
	nicotine / carbon monoxide, damages artery lining / endothelium;		
	increased risk of atherosclerosis / thrombus;		
	atherosclerosis described (e.g. ref to deposition of fatty material atheroma / fatty plaque / cholesterol);	al/	
	carbon monoxide reduces oxygen transport / levels;	3 max	

[Total: 11]

Page 5	Mark Scheme	Syllabus	Paper	
<u> </u>	AS Level Examinations – June 2002	9700	2.	ı

Question	n,	Expected Answers	Marks
5 (a)		decrease in response to drug / effects of drug become less intense;	
		more drug taken to achieve same effect;	
		increased rate of metabolism of drug;	
		decrease in sensitivity of receptors / more receptors made;	
		body cannot function without drug / drug becomes part of metabolism;	
		ref withdrawal symptoms / abstinence syndrome;	3 тах
(b)		fatty liver / fat accumulates;	
		hepatitis, inflammation (of liver); cells die;	
		fibrous tissue / collagen (accumulates);	
		nodules, described (e.g. hard / no blood supply / disrupt	
		arrangement of cells);	
		cirrhosis;	
		liver cancer;	4 max
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Questio	b.	Expected Answers	Marks
6 (a)	(i)	A nitrogen fixation;	
` ,	` '	B nitrification;	
		C denitrification;	3
	(ii)	legumes / green manure / compost / organic matter / humus / manure / AW ploughed into soil;	1
		decay / decomposition to release ammonium / (ions)	
		ammonification / form nitrates;	
		grow legumes for nitrogen fixation;	
		crop rotation / intercropping / alley cropping;	
		improve aeration / drainage (in context of favouring nitrification)	_
		/ reducing denitrification;	3 max
		r	[otal: 6]