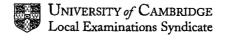


## **NOVEMBER 2002**

## **GCE Advanced Subsidiary Level**

## MAXIMUM MARK:: 60 SYLLABUS/COMPONENT: 9700 /2 BIOLOGY (STRUCTURED QUESTIONS (AS))



Page 1	Mark Scheme	Syllabus	Paper
	AS Level Examinations – November 2002	9700	2

Question	Expected Answers	Marks
1 (a)	correct measurement of scale bar used as basis for finding magnification with appropriate working; A. 1.7 - 1.9 cm for length of scale bar	
	e.g. <u>xx mm x 1 000</u> 10	٠.
	= X xxxx; A. any fig. between x 1700 - 1900	2
	N.B. award one mark if correct answer given without any working shown	-
(b)	movement of air / oxygen into alveoli; concentration gradient (between alveolar air and blood) / AW (for either oxygen or carbon dioxide); oxygen dissolves in film of liquid / surfactant fluid; diffusion; oxygen and carbon dioxide exchanged (idea of); squamous / alveolar / pavement epithelium; } A. alveolar/cap endothelium (of capillary); } wall once red blood cell; ref to short diffusion distance into capillary / one cell thick / 2-3 μm; R. thin wall	illary 4 max
(c)	B lymphocyte / B cell / plasma cell;	1
(d)	secretion of mucus by, goblet cells / glands; fluid leaks from capillaries; R. capillaries permeable contraction of (smooth) muscle / muscle spasm; congestion / blocking / narrowing / AW, of airways / bronchioles;	
t english	increased resistance to air flow / air flow restricted;	3 max
	[Tota	l: 10]

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

Qu	estio	n	Expected Answers	Marks
2	(a)	(i)	A glycerol;	
			B fatty acid;	2
		(ii)	condensation / esterification / ester bond formation;	1 -
	<b>(b)</b>		more energy released / stored per gram / unit / given mass; R. per mole	
			37 kJ v 17 kJ; A. (37-40 kJ) v (15-17 kJ) A. equivalent calorific values if calculated	
•			fats are highly reduced; more hydrogens / fewer oxygens / higher carbon to hydrogen ratio / more CH bonds;	
			release / yield more energy when respired / oxidised;	2 max
	(c)		20% or more above the recommended weight / mass for height / BMI / Body Mass Index / mass kg greater than 30; (height in m) <sup>2</sup>	
			A. within range (30-40)	1
	(d)		diabetes;  coronary heart disease / atherosclerosis / cardiovascular disease stroke / AW; hypertension / high blood pressure; cancer; arthritis / joint problems; hernia; varicose veins;	: <b>/</b>
			gallstones; increased risk during surgical operations;	2 max
	٠.		And the second of the second o	<i>ъ</i> щах

[Total: 8]

Page 3	Mark Scheme	Syllabus	Paper
<u> </u>	AS Level Examinations – November 2002	9700	2

3 (a) stomata (are open) for gas exchange /	
(for photosynthesis and respiration)	,
large surface area / many cell surfaces;	
in spongy mesophyll;	
(so) evaporation from (damp) walls (ir	
(and) diffusion / loss down a conc. gra	in a second seco
to air / atmosphere via stomata;	3 max
(b) ref cohesion / tension (in context of x	ylem);
hydrogen bonds;	
through (freely permeable) cell wall / a	<del>-</del>
through partially permeable membrane cell B);	e / AW (in context of
osmosis;	1
down water potential gradient / high / more negative water potential / AW	
(c) (i) B to A and C;	
A to C;	2
(ii) from cell surfaces through air through	stomata; 1
(d) small leaves / small surface area / reduncedle shaped leaves; R. spines	action of leaf surfaces /
rolled / curled leaves; R. folded	Y
shed leaves;	
sunken stomata / stomata in pits / cryp	pts / grooves;
stomata surrounded by hairs / hairy lea	
waxy / impermeable / thick, cuticle / the	hick leaves qualified; 2 max
	[Total: 11]

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

Question		Expected Answers	Marks
4 (a)		active site;  specific shape / configuration / conformation (in ref to active site);  complementary to substrate / exact / perfect fit (between substrate and active site);  combine to form enzyme-substrate / ES complex;	
		mould around substrate / substrate alters shape of active site	
		(induced fit); R. induced fit unqualified ref to temporary bonds / named bond;	3 max
(b)	(i)	EcoR1;	1
	(ii)	sticky ends;	1
(c)		plasmid DNA cut with <u>same</u> restriction enzyme / endonuclease; DNA and plasmid mixed together / AW; R. inserted ref <u>complementary</u> / <u>base pairing</u> / C and G on sticky ends pair up; ref to hydrogen bonding; ligase forms bonds between <u>sugar</u> and <u>phosphate</u> / phosphodiester bonds;	3 max
		[Total	l: 8]

Page 5	Mark Scheme	Syllabus	Paper
	AS Level Examinations – November 2002	9700	2

Question	Expected Answers	Marks
5 (a)	female, Anopheles, mosquito sucks blood from (infected) person; R. bites	
	parasites / plasmodia / pathogens reproduce / multiply / form	
	gametes (in mosquito);	
:	injects / inserts / pumps in / (saliva) with <u>parasites</u> / transmits / transfers <u>parasite</u> as feeds / in saliva (into uninfected	
	person);	2 max
	person),	2 max
(b)	malarial parasite has	
	nucleus / nuclear membrane / nuclear envelope;	
	mitochondria;	
	membranous organelles; R. ribosomes R. nucleolus	2 max
(c)	fewer red blood cells / number of r.b.cs. reduced;	
(6)	due to bursting / rupturing of r.b.c. / parasite destroys r.b.cs.;	
	less haemoglobin;	
	less oxygen transported / reduced ability to carry oxygen;	
	waste excreted / toxins released (by parasite);	
	symptom; A. one from - anaemia / fatigue / tiredness / muscul	ar
	pain / headaches / nausea / fever / high temp. and sweating /	2
	inability to control temp. / shivering	3 max
	[Total	l: 7]
· ·		•
Question	Expected Answers	Marks
6 (a)	anaerobic; R. inaerobic, R. unaerobic	
	lactate / lactic acid;	
	liver;	
\$	debt; R. deficit	
	aerobic;	_
	resting;	6

Total mark for paper = 50

[Total: 6]