

#### **NOVEMBER 2002**

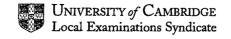
#### **GCE Advanced Level**

## MARK SCHEME

**MAXIMUM MARK: 50** 

SYLLABUS/COMPONENT:9700/4

BIOLOGY (STRUCTURED QUESTIONS (A2 CORE))



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#### Question 1

(a)		4
(i) :		
increase;	·	
rapid/sharp/steep;	5.	
then decrease;		
does not drop to original value ;		2 max
(ii)		ı
decreases to 0 / all used up;		
•		1
	i <sup>th</sup>	
(b)		pt.
(i)		
GP continues to be formed from RuBP;		
(until) all RuBP used up;		
the GP falls as converted to hexose/glucose/TP;		2 max
	• • •	
(ii)		•
in dark RuBP not regenerated/converted to GP;	R used up	
requires the products /ATP/reduced NADP from the ligh	nt reaction / photophospho	rylation; 2
(c)		
ATP;		
reduced NADP;		2
•		
		Total: 9

### Question 2

(a)

	name of structure	stage of respiration
Α	matrix	Krebs cycle ;
В	cristae / inner membrane  A intermembrane space	oxidative phosphorylation/ETC; A build up of protons

Penalise once if rows A and B are correct but swapped If both structure names are correct (but stages incorrect) allow one mark

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(b)
membranes separate from rest of cytoplasm;
allows different pH;
inner membrane attachment of stalked particles / ATPase;
allows linear / ordered arrangement of carriers/ETC/respiratory chain;
ref. to large internal surface area/AW;
                                                                                          3 max
matrix contains enzymes;
(c)
carries / transfers protons/hydrogen(atoms);
and electrons;
in/to ETC /FAD/respiratory chain;
ref. to dehydrogenation/oxidising;
energy used to form ATP;
ref. to coenzyme;
ref. alternative pathways (named);
                                                                                          3 max
(d)
light involved;
occurs in chloroplasts/chlorophyll;
on thylakoid membranes;
ref. to cyclic and non-cyclic;
photolysis of water/produces oxygen;
If oxidative phosphorylation stated
light not involved;
oxygen final hydrogen acceptor/oxygen not evolved;
                                                                                           3max
                                                                                          Total:11
Question 3
engulf / remove / breakdown red blood cells;
haemoglobin broken down;
into haem and globin;
iron removed (from haem);
remainder passes to liver cells to form bile pigments;
globin broken down into amino acids;
                                                                                           4 max
(b)
forms lipoproteins;
stores fats;
synthesises cholesterol;
forms bile salts from cholesterol;
converts glucose to fats;
converts fats to fatty acids and glycerol;
converts fats/glycerol to glucose;
                                                                                           3 max
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			•		
(c)					
diffuses into sinusoi					
dissolved/in solution	1;		• •		
in blood/ plasma;				i	
via hepatic vein ;			· •		
via renal artery;					2 max
		•	4		
(d)					
(i)	. tal (fam tal				4
less glucose / amino	) acids / fatty acids	s and glycerol / nu	itrients/ <b>more</b> urea;		. 1
(ii)	aarban diavida.				1
less oxygen / more	carbon dioxide,		*		ŧ
			, PE		
	. •		••		Гotal : 11
و و د د د د د د د د د د د د د د د د د د	· · · · · · · · · · · · · · · · · · ·		و و د د و د و د و ج و ی براد د د د ج ۴ ۴ تر و ند د و یا جا د د ب		
	en e	4			
	•				
	r ·	ŧ			
. "			need to the second of the seco		
Question 4					
(a)					
metaphase;	•	•			1
(b)					
centromeres divide		R break			
chromatids separate					
idea movt. to oppos		es;	W	. V*	
by microtubules / sp					2
idea.mechanism of	movement;				3 max
1-3			e e	* * * * * * * * * * * * * * * * * * *	
(c)					
(i) breaks down / dispe	oroon '		8	, -	1
preaks down / dispe	31868,				•
(ii)					
centrioles divides/re	enlicate:				
to form two pairs (	=		•		
move to (opposite)	and the same of th				2 max
ord to toppositor	1	•			
(d)				•	
1 random alignmen	t / independent ass	sortment / or desc	ription;		
	naternal and paterr				
2 crossing over / ch	niasmata formation	/exchange of gen	etic material ;		
	tids of homologous				
breaks up linkage	groups / mixes ma	aternal and patern	al alleles;		
	•				
In 1 or 2 ref. differen	ent gametes produc	ced;			4 max
		•			Total : 44
					Total: 11

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Question !	3
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(a)

Either

If genetic diagram used

#### Penalise once for incorrect symbols

orange dominant to black (or converse);

orange scallop

# Or If text explanation given

orange dominant to black (or converse); orange are heterozygous; (because) ref. 3:1 ratio; link data to ratio; black are homozygous; because all offspring are black;

6

(b) separate orange scallops produced from first cross / test cross orange with black; some will produce only orange offspring; these will be homozygous for orange allele/pure breeding;

2 max

Total: 8