

NOVEMBER 2002

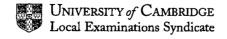
GCE Advanced Level

MARK SCHEME

MAXIMUM MARK: 50

SYLLABUS/COMPONENT:9700/4

BIOLOGY (STRUCTURED QUESTIONS (A2 CORE))



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Question 1

(a) (i)	•	
increase;	•	
rapid/sharp/steep;		
then decrease;	*	
does not drop to original value ;		2 max
(ii)		i
decreases to 0 / all used up;		
		1
	e e	
(b)		
(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 light rea	action / photophosphorylation	; 2
(c)		
ATP;		
reduced NADP;		2
	Tota	al · Q

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
enguif / 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 sinusoids;	•	
dissolved/in solution;		
		•
in blood/ plasma ;		•
via hepatic vein ;		
via renal artery;		2 max
••	4	
(4)		
(d)		
(i)		
less glucose / amino acids / fatty acids and glycerol / nutrient	:s/ more urea;	, 1
(ii)		
less oxygen / more carbon dioxide;		1
less oxygen / more carbon dioxide,		•
	_	
	, r	
		Total: 11
		ت قر و تدهوی تا به سات کا به چاپ می کا در در تا تا در تا
en e		

Question 4		
	-4.	
(a)	* .	
metaphase ;		1
(b)		
centromeres divide / splits; R break		
• • • • • • • • • • • • • • • • • • •		
chromatids separate ;		
idea movt. to opposite poles / centrioles ;	4	
by microtubules / spindle fibres ;		
idea.mechanism of movement ;		3 max
idea.mechanism of movement,		O max
(c)		
(i)		
breaks down / disperses ;	¥	1
preaks down / disperses /		•
(ii)		
centrioles divides/replicate;		
to form two pairs (of centrioles);	•	
move to (opposite) poles;		2 max
move to (opposite) poles,		Z max
(d)		
1 random alignment / independent assortment / or description	n;	
different mix of maternal and paternal chromosomes/chrom		
unterent this of material and paterial enforcementation		
	1	
2 crossing over / chiasmata formation/exchange of genetic m	naterial;	
between chromatids of homologous chromosomes;		
breaks up linkage groups / mixes maternal and paternal alle	eles :	*
Siddie ab minage groups , minae material and parental and	•	
1 4 0 of different number and dead.		A
In 1 or 2 ref. different gametes produced;		4 max
	•	Total: 11

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Question 5 (a)									•	
Either If genetic diagram used		Penalis	se once	for in	correc	t symbol	s			
		orange	e domir	ant to	black	(or conv	erse);			
orange scallop										
parents gametes	e.	S°	S° Sb	S ^b	X	s°	S° Sb	S ^b		;. ;
genotype		S° S°		S° Sb		S° Sb		S ^b S ^b		
phenotype			. 0	range				black		;

black scallop

Sb Sb Sb Sb Х parents Sb Sb) gametes Sb Sb genotype black phenotype

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