

JUNE 2002

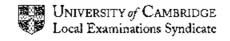
GCE Advanced Level

MARK SCHEME

MAXIMUM MARK: 50

SYLLABUS/COMPONENT:9700/4

BIOLOGY (STRUCTURED QUESTIONS (A2 CORE))



	Mark Scheme	Syllabus	Paper
	A Level Examinations – June 2002	9700	4
uestion 1			
)			
•	ane) / lamellae ;		
grana ;			2
			_
)			
ource of energy excite electrons			
	TP (from ADP) ;		
	P / NADPH / NADPH ₂ / NADPH*;		
f. photolysis (of	water);		2 max
;) .olootsoo loot fro	m photografors II (page profits has DCII and DCI (- ratio has a	al DOL	
	m photosystem It / non cyclic has PSII and PSI / cyclic has or ctron from water in noncyclic ;	niy PSI ;	
	s of water / oxygen produced in noncyclic;		
	ices reduced NADP / NADPH / NADPH ₂ / NADPH ⁺ ;		
	returns to chlorophyll / photosystem 1 in cyclic;		
electron not tak	en from hydroxyl ion / water in cyclic;		4 max
I)			
•	t can be used to kill weeds around growing crop;		1
			•
		To	otaí : 9
	oles / amount of carbon dioxide evolved to volume of owne	n absorbed in	n resniration
	oles / amount of carbon dioxide evolved to volume of oxyge	n absorbed in	n respiration 1
io of volume / m		n absorbed in	* <u>-</u>
io of volume / m) pends on substr	rate;	n absorbed in	* <u>-</u>
io of volume / m) pends on substreater than 1 son		n absorbed in	* <u>-</u>
jo of volume / m) pends on substreater than 1 som rbohydrate 1 / p	rate; ne anaerobic respiration / ref. to a anaerobic respiration;	n absorbed in	* <u>-</u>
io of volume / m) pends on substreater than 1 som rbohydrate 1 / pe f, to other metab	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7;; 2 out of 3	n abso rbed ii	Ĭ
io of volume / m pends on substreater than 1 som rbohydrate 1 / p to other metab	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7;; 2 out of 3 olic processes using oxygen / produce carbon dioxide;	n absorbed in	Ĭ
jo of volume / m pends on substreater than 1 som rbohydrate 1 / pr to other metab a / allowed to e cord level of fluid	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 olic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer;	n absorbed in	Ĭ
pends on substreater than 1 sometohydrate 1 / period to other metable / allowed to ecord level of fluid ange in known ti	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 olic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer;	n absorbed ii	Ĭ
io of volume / m pends on substreater than 1 som rbohydrate 1 / pe to other metab ne / allowed to e cord level of fluid ange in known ti peat;	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 polic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time;	n absorbed in	Ĭ
tio of volume / m pends on substreater than 1 som bohydrate 1 / p to other metab and allowed to e cord level of fluid ange in known ti peat; en clip and rese	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 polic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time;	n absorbed in	Ĭ
jo of volume / m pends on substreater than 1 som rbohydrate 1 / p to other metab and allowed to e cord level of fluid ange in known to peat; en clip and rese f units;	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 olic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time;	n absorbed i	Ĭ
pends on substreater than 1 some beater than 1 some	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 solic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time; st level; as a control; rbs-carbon dioxide given off;	n absorbed i	Ĭ
pends on substreater than 1 some pends on substreater than 1 some pends of the pend	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 solic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time; st level; as a control; rbs-carbon dioxide given off;	n absorbed i	Ĭ
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ip of volume / me pends on substrater than 1 some pends on substrater than 1 some pends of the condition of the of the conditio	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 polic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time; et level; as a control; rbs carbon dioxide given off;	n absorbed in	1 2 max
pends on substreater than 1 somethorydrate 1 / perfect to other metaborate 1 / perfect to each through the condition of the condition of the color and reserved to boiled seeds to soda lime absort to calculation; move soda lime peat experiment	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 colic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time; et level; as a control; rbs carbon dioxide given off; / ref. to comparison;	n absorbed i	1 2 max
pends on substreater than 1 sometohydrate 1 / per f. to other metabore allowed to ecord level of fluid ange in known to eat; en clip and reservents; for boiled seeds soda lime absort to calculation; for the content of the calculation; for the calculation; for the calculation; for the calculation; for the calculation is the calculation; for the calculation is the calculation; for the calculation is the calculation is the calculation; for the calculation is the calcu	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 polic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time; as a control; thevel; as a control; these carbon dioxide given off; if ref. to comparison; nometer rose or fell;	n absorbed in	1 2 max 4 max
pends on substreater than 1 some tookydrate 1 / per tookydrate 1 / pen clip and reservents; tookydrate seeds soda lime absort tookydrate absort tookyd	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 polic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time; as a control; thevel; as a control; these carbon dioxide given off; if ref. to comparison; nometer rose or fell;	n absorbed i	1 2 max
pends on substreater than 1 some reader to calculation; to calculation; to calculation; to calculation; to calculation;	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 polic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time; as a control; thevel; as a control; these carbon dioxide given off; if ref. to comparison; nometer rose or fell;	n absorbed in	1 2 max 4 max
pends on substrater than 1 some reads on substrater than 1 some reads of the condition of t	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7 ;; 2 out of 3 olic processes using oxygen / produce carbon dioxide; quilibrate; d in manometer; ime / ref. time; et level; as a control; rbs carbon dioxide given off; ; / ref. to comparison; nometer rose or fell; erature on enzymes in respiration;		1 2 max 4 max 2 max
pends on substreater than 1 some the pends on substreater than 1 some pends of the	rate; ne anaerobic respiration / ref. to a anaerobic respiration; rotein 0.9 / fat 0.7;; 2 out of 3 olic processes using oxygen / produce carbon dioxide; quillibrate; d in manometer; ime / ref. time; et level; as a control; rbs carbon dioxide given off; // ref. to comparison; nometer rose or fell; erature on enzymes in respiration; of temperature eg increased collisions / kinetic energy / more		1 2 max 4 max 2 max

ref. to $Q_{10} = 2$

Total: 11

2 max

	Page 2	Mark Scheme	Syllabus	Paper
		A Level Examinations – June 2002	9700	4
uest	ion 3			
1)	, \			
	et proteins }			
ef. ga la* K		o / carrier protein ;		
		ochemical gradient;		2 max
b)				
)	Na¹ in ;			
•		nization / figures -60mV to +40mV ;		
	ref. action po	tential;		2 max
ii)	K* out ;			
•	restores resti	ng potential / repolarisation :		2
c)				
cts a	s an insulator :			
ction	potential cann	ot fire in part of axon covered by myelin sheath / only	at node of Ranv	er;
va / I	K* cannot pass from node to :	node / ref. sattation / ref. to local circults;		
•	ls up impulse t			3 max
d)				
	ency of impulse	95 ;		1
•			7	otal : 10
Ques	tion 4			
-1				
(a)				
(1)	formation of	giomerular filtrate / ultrafiltration / pressure filtration ;		deside : 7
	(soluble) mo	lecules / water, urea, glucose in plasma forced into ne	priron / kraney ta	ibtile , Z
(ii)	removing rea	absorbed molecules;		_
•	water / gluco			2
(iii)	removing wa	ater:		
,,	from / reabs	orbed by collecting ducts ;		_
	ref, to maint	ain water potential gradient (in medulla)		2 max
(b)				
perm	<u>eability</u> can be			
corre	ct ref. to ADH	I tractackal is law mass water realizathed :		
if (Dic	ood) water leve ood) water leve	el / potential is low more water reabsorbed; el / potential too high little / no water reabsorbed;		3 max
ii (Dic	od) Hatel leve	, , , , , , , , , , , , , , , , , , , ,		
(c)		and a section of a set of the machine :		
	ras to be regul of infection ;	ated carefully when not on the machine;		
		n on machine / ref. to time on machine;		
ref. to	o expense ;			
diffic AVP		veins / damage to veins ;		2 max

AVP;

Total: 11

Page 3	Mark Scheme	Syllabus	Paper
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Question 5

(a)

correct parental genotype;

correct gametes;

correct genotypes of offspring;

correct phenotypes of offspring linked to genotypes;

RrBb x RrBb

RB Rb rB rb | RB Rb rB rb

	RB	Rb	rB	rb
RB	RRBB	RRBb	RrBB	RrBb
Rb	RRBb	RRbb	RrBb	Rrbb
rB	RrBB	RrBb	rrBB	rrBb
ιp	RrBb	Rrbb	rr8b	ddrr

Round	yellow	Round green	Wrinkled yellow	Wrinkled green
RRBB	RRBb	RRbb	rrBB	rrbb
RrBB	RrBb	Rrbb	rrBb	

(b) wrinkled seeds homozygous / double recessive; round yellow seeds variety of different genotypes / may be heterozygotes; round yellow seeds some do breed true / homozygous dominant;

3

(c)
probability of as large a deviation as 0.47 is between 0.9 and 0.95;
indicating a close fit to the expected results / they do not differ statistically from the expected result;
2

Total: 9