Characteristics and Organisation of the Organism

Mark Scheme 1

Level	IGCSE
Subject	Biology
Exam Board	CIE
Торіс	Organisation of the Organism
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 1

Time Allowed:	54 minutes	54 minu
Score:	/45	/45
Percentage:	/100	/100

Dr. Asher Rana

asherrana@chemistryonlinetuition.com

Question	Answers				Additional Guidance
1 (a)					
	function	letter from Fig. 4.1	name		
	resists the turgor pressure of the cell	Α	cell wall;	-	
	controls the activities of the cell	c	nucleus ;	-	
	site of the chemical reactions of the cell including synthesis of proteins	D	cytoplasm ;	[3]	<b>D</b> – <b>ignore</b> ribosome / mitochondria
(b) (i)	(i) cytoplasm/vacuole, decreases in, size/volume ;				A 'cell shrinks'
	(some) cell membrane/cytoplasm, pulls away/AW, from cell wall;				ignore implodes/shritels up
	plasmolysis/cells are plasmolysed ;				
	cells, are flaccid/not turgid/los	se turgor ;			
	cell walls no longer, pushed outward/withstand pressure;				
(ii)	) salt solution has a lower <u>water potential</u> than the cell ; <b>ora</b>				
	water moves out of the cells, by osmosis;				
	down a water potential gradient/from a high(er) water potential to a low(er) water potential ;				ignore 'water concentration'
	through a partially permeable membrane;				

[Total:9]

2	(a	trans	sports, oxygen/gases ;	[1]	
	(b) (i)	1 2 3	controls activities in the cell/AW ; contains, chromosomes/genes/alleles/genetic information/DNA ; controls how cells, develop/divide/reproduce/grow ;	max [1]	
	(ii)	more to er more	e space for haemoglobin ; nable greater oxygen carrying capacity/AW ; e flexible shape (to move through capillaries) ;	max [1]	



Question	Stion Expected Answers			Additional Guidance
2 (c) (i)	<i>0.15</i> (red	<i>mol dm<sup>-3</sup></i> blood cells) are normal shape/biconcave ;		
	<i>0.20</i> (red	<i>mol dm<sup>-3</sup></i> blood cells) have shrunk/crenation/AW ;	max [2]	
(ii)	1 2 3 4	osmosis ; (diffusion/osmosis) of water molecules into cells ; down a water <u>potential</u> gradient/from high water <u>potential</u> (of solution) to low water potential (in cells) ; across partially permeable membrane ;	max [3]	
(iii)	cell v wate 0.1 I	wall (offers resistance) ; er potential (of plant cells) could be equal/higher/less negative (than M solution) (so no net osmosis) ;	max [1]	7
(d) (i)	0.15 mol dm <sup>-3</sup> ; no net movement of water/ (red blood) cells will remain normal shape/AW;			units must be included <b>A (</b> red blood) cells won't be damaged / isotonic (with solution)
(ii)	<ul> <li>ref to platelets ;</li> <li>fibrinogen converted to fibrin ;</li> <li>soluble to insoluble/fibrin is insoluble ;</li> <li>thrombin/enzyme in context ;</li> <li>mesh/network/web, to trap blood (cells) ;</li> <li>AVP ; e.g. reference to prothrombin or involvement of calcium ions</li> </ul>		max [3]	JE
		1011101	[Total: 14]	

3 <b>(a)</b>	(group of) cells with similar structure(s) working together to perform a function ;	[1]	
(b) (i)	(spongy) mesophyll ;	[1]	ignore palisade
(ii)	diffusion ;	[1]	
(c)	no chloroplasts/chlorophyll in (root hair cells) ; <b>ora</b> root hair cells are not column shaped ; <b>ora</b> (root hair cells) have long protrusion / extension / larger surface area ; <b>ora</b>	max [2]	<b>R</b> root hair cells have hairs

Question		Marks	Additional Guidance
3 <b>(d)</b>	<ul> <li>water moves from root cells, into xylem;</li> <li>cohesion / adhesion AW, of water molecules;</li> <li>(this) pulls on/creates tension (in water column in xylem);</li> <li>Water moves up/through, the xylem;</li> <li>mass flow of water (in xylem)/transpiration stream;</li> <li>water moves into leaf by osmosis (from xylem);</li> <li>loss of water from leaf (cells) lowers water potential;</li> <li>A ref to water potential gradient</li> <li>evaporation, from surfaces of (mesophyll) cells/into air spaces (in leaf);</li> </ul>	max [4]	<ul> <li>ignore method of movement across the root</li> <li>A 'stick together', ref to polar</li> <li>ignore 'water concentration'</li> <li>R 'through stomata'</li> </ul>
(e) (i)	more leaf hairs on lower surface ; leaf hairs appear larger on upper surface ;	max [1]	F
(ii)	<ul> <li>(ii) (increased humidity at lower surface) will reduce transpiration rate ; causes lower water demand / less water loss / reduces chances of wilting; reduced, concentration gradient (water vapour) / water potential gradient ; creates a boundary layer/AW ;</li> </ul>		less water loss by transpiration = 2 marks.
		[Total:12]	
1	1	1	l l

Question			Mark	Addi
4 <b>(a)</b>	feathers ;		max [1]	
(b)	go to 2			5  or  6  correct = 3
	go to 4			1 or 2 correct =
	Spinus tristris	D		
	go to 3			
	Ara ararauna	А		
	Aquila chrysaetos	F		
	Platalea regia	C		
	go to 5			
	Trochilus polytmus	E		
	go to 6			
	Recurvirostra americana	G		
	Phoenicopterus minor	в	[3]	N E

Question			Mark	Additional Guidance
4 (c) (i)	A – meiosis ; B − zygote ;		[2]	
(ii)	(cell/nucleus) has <u>two</u> sets of chromos has pairs of chromosomes ; has chromosomes from <u>two</u> , haploid co has chromosomes from male and fema has twice the number of chromosomes	somes ; ells/sperm and egg/two gametes ; ale (parents) ; s as the gametes ;	max [1]	<b>ignore</b> has 80 chromosomes <b>ignore</b> 2n unqualified
(iii)	increase in complexity ; (named) cells/tissue(s)/organ(s)/orga specialised/differentiate/AW ;	an system(s), become	max [1]	<b>R</b> ref to increase in cell number and cell size
(iv)	ref adaptation to, new/changed, environment/habitat/ecosystem ; any example ; e.g. ref to (new) disease/camouflage/escaping from (new) predators allows, selection/evolution ; ref to reduces competition ; increases chances of survival of the species/reduces chance of extinction ; AVP ; e.g. increase in gene pool			A ref to selective advantage
			[Total: 10]	

## <u>CHEMISTRY ONLINE</u> — TUITION —