OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE

BIOLOGY F211 MS

Unit F211: Cells, Exchange and Transport

Specimen Mark Scheme

The maximum mark for this paper is 60.

<table>
<tr><th>Question Number</th><th>Answer</th><th>Max Mark</th></tr>
<tr><td>1(a) (i)</td><td>
<table>
<tr><th></th><th>eukaryotic cell</th><th>prokaryotic cell</th></tr>
<tr><td>cell wall</td><td></td><td></td></tr>
<tr><td>nuclear envelope</td><td></td><td>✗;</td></tr>
<tr><td>Golgi apparatus</td><td>✓;</td><td></td></tr>
<tr><td>ribosomes</td><td>✓;</td><td></td></tr>
<tr><td>flagellum</td><td></td><td>sometimes present;</td></tr>
</table>
</td><td>[4]</td></tr>
<tr><td>(ii)</td><td>Golgi apparatus
repackage / transport, proteins;
add carbohydrate group to protein; max 1

ribosome
site of protein synthesis;</td><td>[2]</td></tr>
<tr><td>(b)</td><td>flagellum for movement;
chromosomes / DNA, in haploid nucleus / AW, for fertilising egg cell;
head / cap / acrosome, shaped for penetrating egg cell (membrane);
(many) mitochondria for energy / ATP, for movement;</td><td>max [3]</td></tr>
<tr><td>(c)(i)</td><td>group of cells;
of one or more types; A ‘common origin’
with intercellular material/connective tissue / AW;
(specialised) to perform particular function(s); R job</td><td>max [2]</td></tr>
<tr><td>(ii)</td><td>1 mark for any suitable named tissue e.g.
xylem / phloem / epidermis / mesophyll / palisade / spongy mesophyll / chlorenchyma / etc./ meristem / cambium / suitable named tissue;

R leaf tissue / root tip / vascular tissue alone / xylem vessels / sieve tubes</td><td>[1]</td></tr>
<tr><td colspan="2">Total</td><td>[12]</td></tr>
</table>

Question Number	Answer	Max Mark
2(a)(i)	**A** phospholipid**;** **B** protein**;** **F** cholesterol**;**	**[3]**
(ii)	7nm**;** **A** *correct conversion to other units*	**[1]**
(b)(i)	hydrophilic / polar/AW, head**;** hydrophobic / non-polar / AW tail**;** AVP**;** e.g. ref. saturated and unsaturated fatty acids	**max [2]**
(ii)	allow, small / charged, molecules through membrane **;**	**[1]**
(iii)	stabilises membrane structure by forming hydrogen bonds with water molecules**;** antigens for cell recognition**;** binding sites, for, chemicals/ drugs / hormones / neurotransmitters/ antibodies /T cells**;** receptors for cell signalling / triggers chemical reactions inside cell**;**	**max [3]**
	Total	**[10]**

Question Number	Answer	Max Mark
3(a)(i)	*award both marks for correct answer* 3.14 ; 0.52 6:1;	**[2]**
(ii)	ratio for sphere **B** is three times smaller; ora *allow ecf if wrong calculation in **(a) (i)***	**[1]**
(iii)	*any two from the following:* living cells need to take in oxygen/ nutrients and remove (metabolic) waste; ref. passive processes / diffusion; rate of diffusion too slow if SA:V ratio too small;	**max [2]**
(b)	*credit any five descriptions from the following:* many alveoli to produce large surface area; barrier, thin / only two cells thick; good blood supply / many capillaries; to carry dissolved gases to and from the alveoli; ventilation / air movement to refresh the air in the alveoli; (contains) elastic tissue to stretch and recoil to help expel air;	**[5]**
(c)(i)	oxygen is used in respiration; carbon dioxide is released (in respiration); carbon dioxide is absorbed (by soda lime);	**[2]**
(ii)	vital capacity;	**[1]**
	Total	**[13]**

Question Number	Answer	Max Mark
4(a)	(blood flows) twice through the heart / AW**;** for one circuit / cycle (of the whole body) / AW**;** **A** *for one heart beat* ref pulmonary and systemic systems / to lungs and to (rest of) body**;** **R** *systematic*	**max [2]**
(b) (i)	**D** right atrium **E** right ventricle **F** left ventricle	**[3]**
(ii)	provides more, force / pressure, to pump blood around body**;** longer distance compared with distance right ventricle has to pump blood**;** or right atrium**;** AVP**;** e.g. detail of pulmonary circulation *accept letters D, E and F if used in place of names of chambers of heart*	**max [3]**
(c)	iron / Fe**;** four / 4**;** Bohr, effect / shift**;** carbonic anhydrase**;** haemoglobinic acid**;** **A** *reduced haemoglobin* **A** *HHb*	**[5]**
	Total	**[13]**

Question Number	Answer	Max Mark
5 (a)	water uptake / AW**;** **R** *water used*	**[1]**
(b)	1 cut (healthy) shoot under water (to stop air entering xylem vessels)**;** 2 cut shoot at a slant (to increase surface area)**;** 3 check apparatus is full of water / is air bubble free / no air locks**;** 4 insert shoot into apparatus under water / AW**;** 5 remove potometer from water and ensure , airtight / watertight, joints around shoot**;** 6 dry leaves / AW**;** *max 4* 7 keep , condition(s) / named condition(s) , constant**;** 8 allow time for shoot to acclimatise / AW**;** 9 shut screw clip**;** 10 keep ruler fixed and record position of air bubble on scale**;** **R** *'move bubble to end' ideas* 11 start timing and, measure / calculate, distance moved per unit time / AW**;** *max 3*	**max [7]**
(c)(i)	103**;** **R** *decimals*	**[1]**
(ii)	plant **A** hairs around stoma**;** trap, moisture / water vapour**;** reduces the water potential gradient**;** so transpiration rate is reduced**;**	**max [3]**
	Total	**[12]**

Paper Total [60]

Assessment Objectives Grid (includes QWC)

Question	AO1	AO2	AO3	Total
1(a)(i)	4			**4**
1(a)(ii)	2			**2**
1(b)		3		**3**
1(c)(i)	2			**2**
1(c)(ii)	1			**1**
2(a)(i)	3			**3**
2(a)(ii)	1			**1**
2(b)(i)	2			**2**
2(b)(ii)	1			**1**
2(b)(iii)	3			**3**
3(a)(i)		2		**2**
3(a)(ii)		1		**1**
3(a)(iii)		2		**2**
3(b)	5			**5**
3(c)(i)		2		**2**
3(c)(ii)		1		**1**
4(a)		2		**2**
4(b)(i)		3		**3**
4(b)(ii)		3		**3**
4(c)		5		**5**
5(a)	1			**1**
5(b)	3		4	**7**
5(c)(i)		1		**1**
5(c)(ii)		3		**3**
Totals	**28**	**28**	**4**	**60**
Targets	**28**	**28**	**4**	**60**

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