

BY2 January 2014

Question	Marking details	Marks Available
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1

Characteristic	Plant;	Animal; Accept animalia	Prokaryote; Accept prokaryotic	Protoctista; NOT protozoa/ fungi
Eukaryotic	✓	✓	✗	✓
Chloroplast	✓	✗	✗	Some species
Cell wall	✓	✗	✓	Some species
Nucleus	✓	✓	✗	✓

4

Question 1 total

[4]

Question	Marking details	Marks Available
2	(a)	
	(i) <i>atrio-ventricular node (max 2)</i> <u>{collects/ receives}</u> {wave of excitation/ impulses} <u>from SAN</u> ; NOT signal passes on to {Purkyne fibres/Bundle of His}; allows delay before wave passed to ventricles/ stops atria and ventricles contracting at the same time;	2
	(ii) <i>Bundle of His and Purkyne fibres</i> conducts wave to {base/ apex} of ventricles/ heart; ensures contraction (from base) upwards;	2
	(b)	
	(i) 11;	1
	(ii) 7;	1
	(iii) 1;	1
	(iv) 6;	1
	(v) 4;	1
	(vi) 2;	1
	(vii) 12;	1
	(viii) 10;	1
	Question 2 Total	[12]

Question	Marking details	Marks Available
3	(a) (i) 24/ 25/26%;	1
	(ii) Any two from (vigorous) exercise/ OWTTE; high levels of (aerobic) <u>respiration</u> ; oxygen used/ needed (by muscle cells);	2 max
	(b) C/mouse;	1
	(c) (i) curve to right of C;	1
	(ii) Any three from (move to right) lowers affinity of <u>haemoglobin</u> for oxygen; <u>more</u> oxygen released/ oxygen <u>more</u> readily dissociates; at the same partial pressure of oxygen; for (aerobic) respiration;	3 max
	(d) Any three from curve shows haemoglobin has high affinity for oxygen; can{ pick up/ absorb} oxygen at {low partial pressure/ high altitude}/ can be become saturated with oxygen {more easily/ lower partial pressure/ at altitude}; Llama lives at high altitudes where oxygen is scarce; small change in partial pressure results in a large change in % saturation;	3 max
	(e) Curve A;	1
	Question 3 total	[12]

Question	Marking details	Marks Available
4	(a)	
	(i) organism that lives {on/in} another {organism/ host}; causes {harm/ damages} to host/ at the expense of the host;	2
	(ii) Any three from {suckers/hooks} (for attachment to host gut); <u>large surface area to volume ratio</u> ; {thin/ flattened}{proglottids/ segments}; covering resistant to host's digestive enzymes; NOT immune system hermaphrodite/ OWTTE; produces large number of eggs; no digestive system;	3 max
	(iii) Any three from Carnivorous/ carnivore; {Large/ pointed} canines for {tearing/grasping flesh/ killing prey}; molars/premolars for {cutting/ slicing} meat; NOT tearing (small) incisors for {gripping/ stripping} flesh; <u>carnassials</u> teeth for {crushing/cutting}; vertical movement of jaws;	3 max
	(b)	
	(i) obtains {food/ nutrients} from another organism/heterotrophic;	1
	(ii) A {requires food digested by host/ no digestive system}, B {digests food itself/ has digestive system}; A absorbs food {externally/at surface}, B internal absorption;	2
	Question 4 Total	[11]

Question	Marking details	Marks Available
5	(a)	
	(i) Change in mass = $11.2 - 13.6 = -2.4$; % change in mass $(-2.4/13.6) \times 100 = 17.6/ 17.65 \%$; NOT 17.7	2
	(ii) {greater percentage of water lost/ largest change in mass} when upper surface <u>only</u> is covered/ when lower surface is covered there is less change in mass; more stomata on lower surface; some water is lost through upper surface as{some/ few/ less} stomata present;	3
	(iii) to ensure that {all of the / maximum loss of} water was lost from the leaves;	1
	(b)	
	(i) xerophytes/xerophytic;	1
	(ii) {lower density of/ less} stomata; (rolling causes) upper epidermis to face inwards/ stomata are on the inside of (rolled) leaf; <u>no</u> stomata on {lower/exposed} surface/ <u>all</u> stomata on the {upper/ inner} surface;	3
	(iii) Any two waxy cuticle on lower surface; reduced leaf surface area; sunken stomata; hairs; long roots;	max 2
	Question 5 Total	[12]

Question	Marking details	Marks Available
6 (a)	lamellae/gill plates;	1
(b)	water {forced/ flows} over gill (filaments); by pressure changes/ OWTTE; (pumping) action of mouth and operculum/ OWTTE; water flows in opposite direction to blood/counter-current mechanism; maintains {diffusion/ concentration} gradient across {entire/ whole} gill (filament); as blood always meets water with a higher oxygen concentration/ equilibrium is never reached;	max 4
(c)	Any four <u>large</u> surface area; {(dense) network/ large number} of <u>capillaries</u> ; NOT good blood supply {thin/permeable} <u>epithelium</u> ; moist; short diffusion pathway;	max 4
Question 6 Total		[9]

Question	Marking details	Marks Available
7	<p>(a)</p> <p>A plants have well established root system/ OWTTE;</p> <p>B leaves are thin/ large SA for photosynthesis/ gas exchange;</p> <p>C {waxy cuticle/ shed leaves in winter} to <u>reduce</u> water loss;</p> <p>D {stomata/ guard cells} to {control/ reduce} water loss;</p> <p>E xylem transport water;</p> <p>F phloem transports organic solutes/ amino acids;</p> <p>G xylem/ tracheids provide structural support;</p> <p>H brightly coloured {flowers/ petals/ scent/ nectar} to attract insects;</p> <p>I Adaptation of pollen to insect pollination e.g. sticky/ hooks;</p> <p>J large amounts and small sized pollen grains for wind pollination</p> <p>K pollen grains have hard coats to prevent desiccation;</p> <p>L no requirement for gametes to travel through water/ fluid;</p> <p>M resistant {coat/shell} around the seed to {withstand adverse conditions/ protect};</p> <p>N food store in seeds;</p> <p>O embryo develops in seed until {germination/ leaves are produced} (above ground);</p> <p>P seed dispersal adaptations/ appropriate example</p>	10 max

Question	Marking details	Marks Available
7 (b)	<p>A reproduce by mitosis;</p> <p>B <u>genetically</u> identical/clones; <i>advantages</i></p> <p>C less chance of mutation;</p> <p>D adapted to same conditions as parents/ owtte;</p> <p>E parent can provide support until independent;</p> <p>F example of asexual reproduction: strawberry/other appropriate named example;</p> <p>G no need for (second organism for) fertilisation/ only one parent is needed;</p> <p>H no wastage of gametes/ less energy wasted;</p> <p>I rapid increase <u>in numbers</u>/ large numbers produced;</p> <p>J no special mechanisms required;</p> <p><i>disadvantages</i></p> <p>K lack of genetic variation {means more susceptible to wiping out/ less able to adapt};</p> <p>L (means more susceptible to wiping out) by disease;</p> <p>M (less able to adapt) environmental changes;</p> <p>N no chance of evolution/natural selection;</p> <p>O less chance of dispersal/ restricted to one niche;</p> <p>P more competition for resources;</p>	10 max
Question 7 Total		[10]