

Question	Answers	Marks	Guidance
1 (a)	<p><i>general marks</i>            roots absorb water ;            idea of <u>both</u> gaining water over a large, volume / area, of soil ;            AVP ;</p> <p><b>A</b> has deep roots / go a long way down ;            to gain water that drains through soil / reach water table / AW ;</p> <p><b>B</b> has shallow roots / wide spreading roots / AW ;            absorbs water, before it drains <i>or</i> evaporates / immediately after rainfall ;</p>	[max 4]	<p>NB water absorption and area marks given once only</p> <p><b>R</b> long roots unqualified</p>
(b)	<p>thick cuticle ;            longer distance for diffusion / not easy for water to pass through / ref to impermeable ;</p> <p>rolled leaves ;            air trapped inside rolled leaf has <u>higher</u> humidity AW / stomata protected from wind <i>or</i> moving air (reduces transpiration) ;</p> <p>sunken stomata / stomata in pits <i>or</i> grooves <i>or</i> depressions ;            chamber has <u>higher</u> humidity AW / stomata protected from wind <i>or</i> moving air (so reducing transpiration) ;</p> <p>hairs on leaf ;            reduce air flow over the surface (so reducing transpiration) /            increase humidity by 'trapping' water (molecules) ;</p> <p>small leaves / leaves reduced to spines / leaves are needles / no leaves / leaves shed in very dry periods ;            small(er) / no surface area (for transpiration) ;</p> <p>fewer stomata / stomata closed during hot parts of day ;            stomata are pores through which water can pass (so reducing transpiration) ;</p>	[2 + 2]	<p><b>R</b> cuticle unqualified or ref to 'waxy' without description of thickness</p> <p>Must be <b>TWO</b> descriptions (max) with appropriate linked explanations</p> <p><b>explanations alone cannot be accepted</b></p> <p><b>A</b> correct references to water potential / concentration gradient for rolled leaves or sunken stomata</p> <p>IGNORE references to succulent leaves and storage (not water loss)</p> <p>'sharp' leaves also need to be small</p>

Question	Answers				Marks	Guidance
1 (c)	tissue	substances transported	source	sink	[6]	<p><b>NB</b> substances transported score:-</p> <p><b>ONE</b> mark for <b>TWO</b> correct responses</p> <p><b>R</b> references to single cells as sources or sinks e.g. root hairs</p> <p><b>R</b> glucose</p> <p>mark each box independently</p>
xylem	water, ions / named ion / mineral / salts ;	roots ;	stem / growing points / buds / leaf / flower / fruit / seed / storage organ ;			
phloem	Sucrose / sugar, amino acids ;	<i>either</i>				
		leaf ;	stem / growing points / buds / root / flower / fruit / seed / storage organ ;			
		<i>or</i>				
		storage organ ;	<u>young AW</u> leaf / stem / growing points / buds / root ;			
<b>[Total: 14]</b>						

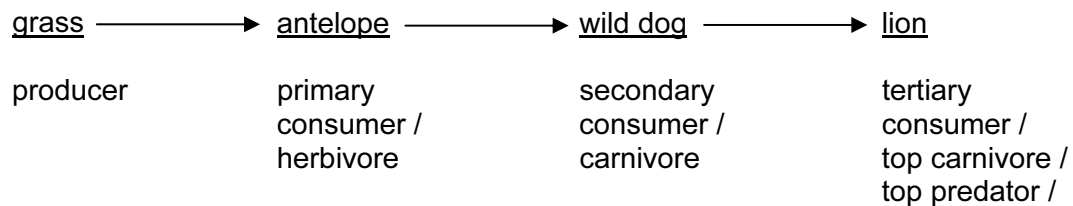
2 (a) (i) eats / consumes / feeds on, animals / meat / flesh ; [1]

(ii) fur / hair / whiskers / vibrissae ;  
external ear(s) / pinna(e) ;  
mammary glands / breasts / nipple / glands that produce milk / AW ;  
R milk unqualified by external structure [max 1]

(b) (i) disease / parasite(s) / (named) pathogen(s) ;  
hunting (by farmers) ; R poaching  
shortage of, food / antelopes ; A idea of fewer  
shortage of water / drought ;  
predation (by lions) ; A more lions  
loss of habitat / AW e.g. territory ; R space unqualified  
change of climate / AW ;  
pollution ;  
AVP ; e.g. shortage of mates / small populations do not breed as much  
R competition unqualified [max 2]

(ii) extinction / become endangered / become rare / inbreeding ; [1]

(c)



1 mark for minimum of two arrows in correct direction ;  
1 mark for all organisms named and all in correct order as a chain ;  
*ignore sun / decomposers / parasites*  
2 marks for labelling the trophic levels –  
*either* producer, primary, secondary + tertiary consumer  
*or* 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> ; ;  
*if one or two labels incorrect award 1 mark* [4]

- 2 (d) (i) maintenance / protection / preservation / 'caring for' / 'looking after' ,  
of, habitat / ecosystem / community / species / (named) organisms / resources;

'making a habitat' = 1 mark

**One of the following for a max 1 mark**

for future generations / prevent extinction ;  
encourage breeding (in wild or in captivity) ;  
ref to, biodiversity / genetic resources / AW ;

[max 2]

- (ii) prevent destruction of, grassland / habitat ; **A** preserve  
(nature) reserve / wild life park / AW ;  
rangers / wardens ;  
ensure good supply of, food / antelopes / prey / AW ;  
legislation / AW ; e.g. refs to poaching / wild life trade  
control of, predators / lions ;  
**A** 'kill lions' / 'drive lions away' / 'provide food for lions'  
education of local population ;  
captive *breeding* / *breed* in a zoo / *breeding* programme ;  
reintroduction to the wild ;  
AVP ; e.g. further detail of any of the above points

[max 3]

- (e) *ignore refs to nitrogen fixation / denitrification*  
*marking points 7 + 8 must be in the correct context*

- 1 (eaten / digested by) (named) scavenger(s) / hyaenas / vultures ;
- 2 excretion / urine / egestion / faeces / AW ;
- 3 dung beetles / detritivores / maggots ;
- 4 decay / decomposition / rotting, by, bacteria / fungi / named decomposer ;
- 5 protein → amino acids ;
- 6 deamination / amino acids → ammonia ; } **A** protein → ammonia
- 7 ammonia → nitrite ; } **A** ammonia → nitrate
- 8 nitrite → nitrate ; } **A** ammonia → nitrate
- 9 nitrification / nitrifying bacteria ;
- 10 *Nitrosomonas* / *Nitrobacter* in correct context of nitrification ;
- 11 plants absorb, nitrate / ammonia ;

'decomposition by nitrifying bacteria' = 0

[max 5]

[Total: 19]

- 3 (a) *ignore absence of feature(s)*                      *ignore slime*  
shell ;  
muscular foot ; **R** leg / false foot  
(soft) unsegmented body ;  
tentacles ;  
mantle / mantle cavity ;  
gills ;  
AVP ; e.g. visceral mass                      **R** exoskeleton                      [max 2]
- (b) *species name*                      *ignore refs to generic name*  
second name / follows genus name ;  
begins with small letter / all small letters ;                      [max 1]
- (c) *asexual = 0 marks*  
sexual / external ;  
involves, gametes / fertilisation ;                      [2]
- (d) ( *current of water provides*  
(good) source of oxygen ; **A** ref to obtaining oxygen  
                    **R** 'from gills' / 'easy to breathe'  
low carbon dioxide concentration ; **A** ref to losing carbon dioxide  
food source ;  
protection / hiding, from predators ;  
blood / mucus (from gills), may be food source ;                      [max 1]
- (ii) *one of the following*                      *ignore growth / maturity*  
increase in complexity  
differentiation / specialisation, of cells / tissues  
formation of, new structures / organs / tissues / different types of cells  
                    **A** change in, structure / form                      [1]
- (e) *one mark for named species, two max for details. If no species = no marks,*  
*NB species **may** be identified in outline of conservation*  
  
named species ; *must be an endangered species* **R** whale(s), **A** rhino(s)  
*if in doubt check IUCN red list* <http://www.iucnredlist.org>                      [1]
- nature reserve / game park / sanctuary / AW ;  
protection of habitat / stop habitat destruction / fenced area / restore habitat  
                    **A** example ;  
control of, predators / grazers / parasites / disease ;  
provide food supply ;  
prevent hunting / reduce poaching / reduce fishing / AW ;  
                    **A** wardens / rangers  
education (of local population) ;  
captive breeding / provide breeding sites ;  
release of captive bred organisms ;  
AVP ; ; e.g. dehorn rhinos, ban trade                      [max 2]

[Total: 10]