

Human Influences on Ecosystems

Mark Scheme 12

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|------------|--------------------------------|
| Level | IGCSE |
| Subject | Biology |
| Exam Board | CIE |
| Topic | Human Influences on Ecosystems |
| Paper Type | (Extended) Theory Paper |
| Booklet | Mark Scheme 12 |

Time Allowed: 52 minutes

Score: /43

Percentage: /100

| 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>A has deep roots / go a long way down ; to gain water that drains through soil / reach water table / AW ;</p> <p>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>R 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>R cuticle unqualified or ref to 'waxy' without description of thickness</p> <p>Must be TWO descriptions (max) with appropriate linked explanations</p> <p>explanations alone cannot be accepted</p> <p>A 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] | NB substances transported score:- ONE mark for TWO correct responses R references to single cells as sources or sinks e.g. root hairs R glucose mark each box independently |
| | 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 ; | | |
| [Total: 14] | | | | | | |

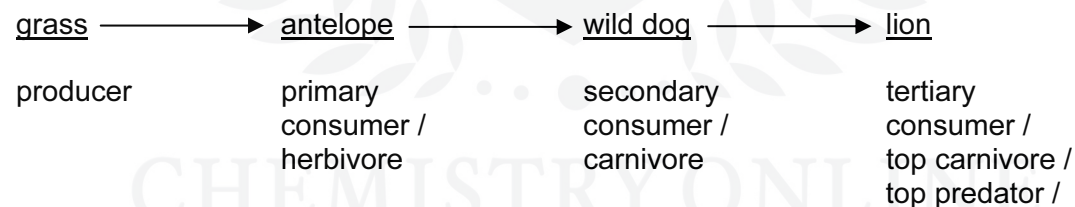
2 (a) (i) eats / consumes / feeds on, animals / meat / flesh ; [1]

(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 1st, 2nd, 3rd, 4th ;;
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 ;
- 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]

- 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]

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