

- M1.** (a) species present change the habitat/named change;
other species able to colonise;
new species better competitors; 3 max
- (b) D - as more species present;
more complex food webs;
change in one species will have little effect on others;
as alternative food sources; 2 max
- (c) sand drains easily/low water retention;
(sunken stomata) reduce transpiration;
as pocket of saturated air trapped near stomatal pore;
this reduces diffusion/water potential gradient; 3 max
- (d) series of changes over a distance;
gradient of environmental factor/named environmental
factor/cline present;
ensures sampling of each community; 1 max
- [9]

- M2.** (a) 1. (Colonisation by) pioneer (species);
2. Change in environment/example of change caused by
organisms present;
3. Enables other species to colonise/survive;
4. Change in diversity/biodiversity;
5. Stability increases/less hostile environment;
6. Climax community;
- Example of change e.g. formation of soil/humus/organic
matter/increase in nutrients;*
- Do not accept genetic diversity for mark point 4.*
- 5 max
- (b) Advantages
1. Specific (to one pest);
2. Only needs one application/reproduces;
3. Keeps/maintains low population;
4. Pests do not develop resistance;
5. Does not leave chemical in environment/on crop/no
bioaccumulation;
6. Can be used in organic farming;

Disadvantages

7. Does not get rid of pest completely;
8. May become a pest itself;
9. Slow acting/lag phase/takes time to reduce pest population;
Max 3 for advantages or disadvantages.
Ignore references to leaching, eutrophication.
Ignore references to cost.

5 max

- (c)
1. Geographical isolation;
 2. Separate gene pools/no interbreeding (between populations);
 3. Variation due to mutation;
 4. Different environmental/abiotic/biotic conditions/selection pressures;
 5. Selection for different/advantageous, features/characteristics /mutation//allele;
 6. Differential reproductive success/(selected) organisms survive and reproduce;
 7. Leads to change in allele frequency;
 8. Occurs over a long period of time;
In this question must refer to allele where appropriate, not gene.

5 max

[15]

- M3.** (a) pioneers/suitable example colonise land;
 example of change in environment;
 enables change in species;
conditions change further/example to favour trees;

4

- (b) stable community/no further succession/final community;

1

- (c) roots unable to respire (aerobically);
 active transport of minerals/other metabolic effect stops;

2

- (d) action of bacteria/decomposers inhibited/ fewer bacteria/decomposers;
acid conditions inhibits enzymes/enzymes denatured/changes active site;
H⁺ ions affect active site;
anaerobic conditions;
- 3 max
- [10]
- M4.** (a) populations of different species;
living in the same environment/habitat;
(often) named after dominant plant/example;
(one mark for principle: all the species living in the same place)
- 2 max
- (b) more species/diversity (in the field);
more niches/habitats;
more feeding opportunities (range of types available);
- 3
- (c) one method named, e.g.:
mark, release, recapture;
sweep netting/kick sample;
pitfall traps;
light trap;
- 1 max
- [6]
- M5.** (a) 1. colonisation/pioneering;
2. microscopic plants at start;
3. death / decomposition;
4. named change in environment e.g. increase in organic matter/
stabilisation;
5. new species colonise once there is a change;
6. increase in number of species/diversity;
7. increase in total amount of living material/biomass/ more niches;
8. increase in nutrient availability;
9. change from more extreme conditions / more stability;
- 6 max
- (b) marking principles:
one mark – direct result of removing forest cover;
e.g. soil erosion/leaching
one mark – specific effect on organisms in lake;
e.g. more sediment/nutrients (for plants to grow)
- 2

- (c)
1. named nutrient availability;
 2. numbers of producers providing energy (for a food chain);
 3. light intensity affecting the rate of photosynthesis;
 4. disease killing (weaker) members of species;
 5. space for nest building / niches;
 6. reproductive rate balancing death rate;
 7. competition for a named limited resource;
 8. (intra and interspecific) competition explained;
 9. predation described;

5 max

[13]

- M6.** (a) (Increase in) dead organisms/humus/decomposition;

Leading to (increase in) nitrification/ammonia to nitrate/activity of nitrifying bacteria;

Nitrogen fixation;

Accept: pioneer species for plants

2 max

- (b) (i) Bare soil temperatures fluctuate;

Reject: environmental temperature

Accept: converse

More bare soil, early/at start of succession/when few plants;

2

- (ii) Plant will grow/survive in the shade/when overshadowed (by taller plants)/when receiving less light;

Effect on plant with reason for effect

Ignore reference to competition

1

- (c) (Grassland consists of) small/annual plants;

Must be in the context of grassland

Will be replaced by/outcompeted by woody plants;

Need idea of replaced not just an increase in percentage cover

So these (woody plants) must be removed/have growth checked/grazed;

2 max

[7]

- M7.** (a) Increase in number of species;

Increase in numbers of some species;

2

(b) Initial environment hostile / few organisms adapted;

These organisms change the environment / suitable example;

More niches / more habitats;

Allowing other organisms to become established;

max. 3

[5]

M8. (a) (i) change in community over time;
either due to change environmental/abiotic factors / change
is due to species present;

2

(ii) stable community/no further succession/final community;

1

(b) (increased) interspecific competition;
for light/nutrients/named nutrient/water;

2

(c) fewer leaves/lower surface area/shading of leaves;
less photosynthesis to produce new biomass/glucose/growth;
competition with other species for nitrates/named nutrient;
reduced synthesis of protein or named compound;
ratio of leaves to woody parts and roots decreases;
so higher respiration relative to photosynthesis;

3 max

[8]

