



**CHEMISTRY ONLINE**  
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# BIOLOGY

## GENETICS, POPULATIONS, EVOLUTION & ECOSYSTEMS

Level & Board	AQA (A-LEVEL)
TOPIC:	POPULATIONS IN ECOSYSTEM
PAPER TYPE:	SOLUTION - 2
TOTAL QUESTIONS	6
TOTAL MARKS	36

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## Populations in Ecosystems - 2

1.

(a) The Sterile Insect Technique (SIT) is a form of insect birth-control using irradiation. The process involves breeding and segregating billions of male mosquitoes in dedicated facilities, sterilizing them with x-rays and then releasing them to mate with females in the wild.

OR

Intraspecific competition

Do not breed

(b)

Capture, mark & release them

Leave time for mosquitoes to disperse, before recollection

Population = number in 1st sample x number in 2nd sample / by number marked

(c)

Radiation affects their 'attractiveness' / courtship / survival / life span.

2.

(a) To replace ones that have died they carry a lethal gene.

OR

To maintain number / competition as they die / have a short life span.

(b) number of mosquitoes in treated area is low at 12 weeks

3.

(a)

Overall, there is an increase in SPECIES RICHNESS / SPECIES DIVERSITY / total no. of living organisms

named species from table are PIONEER SPECIES

Pioneers cause NAMED change of environment (maybe increasing soil when they die and are decomposed)

New species from data (named from data table) colonise once there is a change

Decline in (named species from table) as succession continues / OUTCOMPETED

\*\* Note: you generally need to include changing abiotic conditions in answers. ALSO, always state that species x declines and species y increases!!

**OR**

Overall, data show an) increase in species richness / increase in species diversity / increase in total number of living organisms

Baetis quilleri and / or Pentaneurini guttipennis are pioneers

Pioneers cause named change of environment e.g. provide food for other species

New species / example from data colonise once there is a change

Baetis quilleri / Pentaneurini guttipennis / Helicopsyche Mexicana decline / outcompeted / eaten as succession continues.

**(b) 5.5**

**(c)** Same species present over long time / stable community over long time

Abiotic factors more or less constant over time

Populations stable around carrying capacity

**4.**

**(a)** Human activities have had a profound and often devastating impact on biodiversity. From habitat destruction to pollution, overexploitation, and climate change, we have disrupted the delicate web of life on Earth.

**OR**

Only cleared and abandoned and introduction of non-native species make significant decrease

Because only these  $\pm 2$  SDs from zero/no change

About same number/4 to 3 increase or decrease in species richness

**(b)**

Non-native species out-competes / kills / eats / is a disease of native plants.  
Some populations of native species become extinct in the community.

**(c)**

Set up grid system with coordinates

Place large number of quadrats (at coordinates) selected at random

Count number of / estimate percentage cover of native plant in Quadrats

Repeat at same time each year for many years

**5.**

**(a)** – 0.0599

**6.**

**(a)** Interspecific competition

**(b)**

Don't give the livestock extra food so their populations don't grow too large and compete with ibex

Don't farm horses because their food similar and their habitat is the same as the ibex so will compete the most

It would be better to farm yaks than cows because even though they eat the same food as ibex they have different habitats so less likely to compete for the food

I am Sorry !!!!!



**DR. ASHAR RANA**



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