BIOLOGY

GENETICS, BIODIVERSITY & CLASSIFICATION

Level & Board	AQA (A-LEVEL)
TOPIC:	BIODIVERSITY, WITHIN A COMMUNITY
PAPER TYPE:	SOLUTION - 1
TOTAL QUESTIONS	6
TOTAL MARKS	45

Biodiversity within a community - 1

1.

(a) 0.37 – 0.38

(b)

- She is incorrect because plot 1 has 4 species and plot 2 also has 4 species.
- It didn't increase.

(c)

- Determine area of plot 1
- Calculate area of meadow
- Divide meadow of area of plot
- Multiply by number of beetles per plot

2.

(a) 2256 / 590 = 3.8

(b) Index of diversity measures number of each species. So useful because may be many of some species

(c) Movement of object over known distance and over given time

(d)

- No food sources
- No available habitats to make competition
- travelled upstream to mate

(e)

Same size of area sampled

OR

Same size net/mesh

OR

Same sampling time

Samples taken at same time of day/on same day

3.

(a) The students would need the number of species and the number of individuals in each species.

(b) The students could have ensured their index of diversity was representative of each habitat by employing two key methods: random sampling and standardized sampling effort.

(c) Decreases the variety of habitats within the fields or there is less hedge/ more centre

(d) Advantage: Provides more habitats, so will attract a wider variety of species- including pollinating insects that improve crop growth

Disadvantage: Decreases area available for farmer to plant crops on, so arguably decreases crop yield.

4.

(a) Species richness represents a measure of the variety of species based simply on a count of the number of species in a particular sample, although it can be expressed more usefully as species richness pre unit area, ranging from alpha (referring to a certain site) to gamma (for an entire study area) level.

(b)

Yes, natural best, because

- Peak of mean bee numbers in natural habitat is highest
- The mean number of bees was higher in the natural habitat until day 200
- Mean species richness in natural habitat higher at all times

No, natural not best, because

Lowest mean number of bees after day 220

Yes, town worst, because

Peak of species richness higher in both natural and farmland

No, town not worst, because

Mean species richness is lower in farmland until day 125

General no, because

Index of diversity of bees not measured

(c)

Must not harm the bees

OR

Must allow the bee to be released unchanged

Must allow close examination

OR

Use a key to identify the species

(d)

- Collect at more times of the year so more points on graph/better line of best fit on graph
- Counted number of individuals in each species so that they could calculate index of diversity
- Collected from more sites/more years to increase accuracy of mean data

(e) A. chlorogaster and A. piperi are more closely related to each other than to P. pruinose because they are in the same genus.

5.

(a) Specie is defined as classification comprising related organisms that share common characteristics and are capable of interbreeding. This biological species concept is widely used in biology and related fields of study. There are more than 20 other different species.

Species richness is the simplest measure of species diversity and is either a count of the number of, or the list of, species inhabiting a given area or habitat.

(b) 5

(c) Doesn't measure the number of individuals of a species

Almost all of the 68% could be of the same species would lower index of diversity

Other samples may have more individuals of each species

6.

(a) 4.916

(b) Ecologists could use a transect sampling method to determine plant species richness at one site. In this method, a line or belt is used to divide the site, and the ecologists identify and record the species of plants that occur along the line.
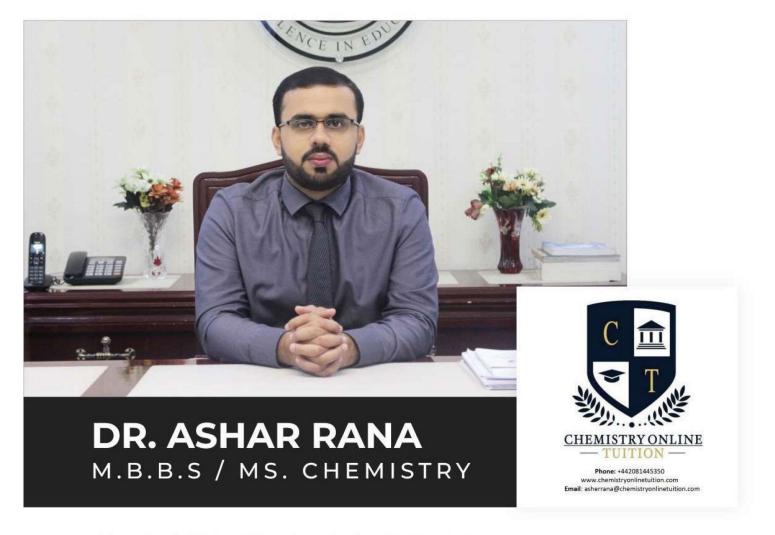
OR

- Grid with coordinates selected using random number generator
- Use of quadrat
- Identify plant species in each quadrat

(c)

- Significant increase in species richness on Islay and Colonsay and significant fall on Harris
- Change in diversity on Islay not significant;
- Greater than 0.05 / 5% probability of getting this change / difference by chance on Islay

I am Sorry !!!!!

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