Mark schemes

Q1.

(a) 1. Mutations/genotype/alleles;

2. Environment/habitat

OR

(Natural) selection;

Accept named different habitats, e.g. 'walls' and 'trees/trunks.

Accept selection pressure e.g. predation.

3. Epigenetics;

4. Crossing over;

Accept recombination.

5. Independent segregation/assortment (of homologous chromosomes);

Accept 'Random assortment'.

6. Random fusion of gametes

OR

Random fertilisation;

2 max

(b) 1. Provides camouflage;

Accept description of camouflage.

2. (So) not seen by predators/prey

OR

Less predation

OR

Obtain/catch (more) prey;

Accept 'stops predation'.

Accept descriptions of reduced predation e.g. 'fewer are eaten'.

2

(c) **Mark point 1 required for max marks**

1. (Geckos in) same habitat/environment/area

OR

No geographical isolation/separation (between geckos);

2. (Possibly) allopatric speciation as different (areas of same) habitat(s)/environment/area

OR

(Possibly) geographical isolation/separation as different (areas of same) habitat(s);

Accept 'walls' and 'trees/trunks' as different habitats.

3. (Could lead to) separate gene pools

OR

Reproductive isolation;

Accept 'can't interbreed' in correct context, i.e., not when describing a species.

Accept 'no gene flow'.

4. Mutation(s);

Reject mutation(s) if context incorrect e.g., 'mutate to adapt', 'mutation caused by selection'.

5. Selection for (both) extremes/colours

OR

Disruptive selection (occurs) as two extremes/ colours;

Accept description of selection e.g. 'favoured'.

Accept selection against 'middle'

6. (Analysis shows that) diurnal geckos are a distinct (genetic) group;

Accept 'nocturnal' for 'diurnal'.

7. (Genomes/DNA indicates geckos are) same species;

5 max

(d) 1. Compare <u>DNA</u> base/nucleotide sequence

OR

Compare banding/position of DNA fragments;

Idea of 'comparison' must be conveyed.

Accept alleles/VNTRs for 'DNA fragments'.

Accept genes for 'DNA fragments' in 1 but reject genes in mark point 2.

Ignore 'gene machine'.

2. A distinct (group) will have different alleles/DNA/banding (from other group/s)

OR

If **not** distinct (group) will have similar alleles/DNA/banding (to other group/s)

Accept genes for 'DNA fragments' in 1 but reject genes in mark point 2.

Accept in context of either nocturnal or diurnal group being the distinct group.

Accept not 'closely related' for 'distinct (group)' and 'closely related' for 'not distinct (group)'.

Reject 'species' for 'group'.

3. DNA sequencing is automated/computerised

OR

Genetic/DNA fingerprinting is automated/ computerised

OR

PCR amplifies DNA/genes

OR

Genetic fingerprinting/electrophoresis separates fragments/genes/alleles

OR

Use of DNA probes/hybridisation to identify genes/alleles;

Ignore 'gene machine'.

(e) 1. Marking not toxic **so** does not affect survival

OR

Marking not visible to predators

OR

Marking does not wash/rub off **so** recaptured (geckos) identified;

Ignore births, deaths, reproduction, immigration, emigration.

Accept 'does not cause harm/death' for 'does not affect survival'.

Idea of marking affecting visibility required in relation to predators.

2. Time/delay after release **so** (geckos) spread (in the population)

OR

Time/delay before recapture **so** (geckos) spread (in the population);

Accept 'after marking' for 'after release'

3. (Population =) (number in) first sample × (number in) second sample divided by (number) marked in second sample / number recaptured;

Accept the correct equation/formula.

3

[15]