

## Mark schemes

**Q1.**

- (a) Binomial;

1

**Q2.**

- (c) Top to bottom
- C N D I**
- ;

**OR**Top to bottom **N C D I**;

1

- (d) 1. (Supported) more similar than with any other species;
- 
2. (Not supported) high (intraspecific) variation in species N (compared with variation between N and C);

*Accept idea that species N has nearly as much variation as between N and C.**Accept 'Low/close similarity in species N (in relation to similarity between N and C)'*

3. Small sample

**OR**

Only five (individuals);

**2 max****Q3.**

- (a) 1. (It shows) smaller groups within larger groups / larger groups containing smaller groups;

*Accept groups within groups*

2. With no overlap (between groups);

2

- (b)
- Family
- ;

*Accept phonetic spellings*

1

- (c) 1. Sine song is (very) similar / same length (for both, so closely related).

2. (But) have different peaks / pulses (in pulse song);

*Must give a difference, not just state they are different**Accept suitable differences eg number / length / amplitude / interval*

2

- (d) 1. (Three) peaks (in pulse song) occur at the same time (since both female) / songs identical / male peaks are different;  
*Accept suitable differences in male peaks eg number / length / amplitude / interval*
2. (Therefore) no male (song) to stimulate / cause mating;  
**OR**  
 Nothing to stimulate / cause mating;

2

[7]

**Q4.**

- (a) 1. (Without genetic analysis / **X**) *mackloti* and *olivaceus* have a more recent common ancestor with each other (than with *papuana*);
2. (Genetic analysis indicates / **Y**) *papuana* and *mackloti* have a more recent common ancestor with one another (than with *olivaceus*);  
*Accept 'more closely related to' for 'more recent common ancestor'*

2

(b)

<b>Domain</b>	Eukaryote
<b>Kingdom</b>	Animal
<b>Phylum</b>	Chordata
<b>Class</b>	Reptilia
<b>Order</b>	Squamata
<b>Family</b>	Python

;

All 5 correct = 1 mark  
 Any errors = 0 marks

1

- (c) Genus / genera;  
*If the response has two answers no mark is awarded.*

1

- (d) 1. The (base) sequence of DNA;  
*Accept 'DNA hybridisation'*
2. The (base) sequence of mRNA;
3. The amino acid sequence (of proteins);

3

[7]

**Q5.**

- (a) 1. Same genus;  
2. Same evolutionary origin / common ancestor.

2

(b)

Taxon	Name of Taxon
Domain	Eukarya
Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Rodentia
Family	Muridae

3 correct = 2 marks  
2 correct = 1 mark  
1 or 0 correct = 0 marks

2

- (c) 1. (No) SDs of means of body sizes / sizes of parts of bodies overlap;  
2. Calculation of correct head and body: tail ratios;  
3. Almost identical, so same body shape / proportions;

3

- (d) 1. Breed the two mice together;  
2. (Same species) produce fertile offspring.

2

**[9]**

**Q6.**

(a) PKNJ.

1

(b) *Lutra lutra*.

1

(c) Bone / skin / preserved remains / museums.

1

- (d) 1. (Hunting) reduced population size(s), so (much) only few alleles left;

*Accept bottleneck*

2. Otters today from one / few surviving population(s);

*Accept founder effect*

3. Inbreeding.

*Allow any **two***

**2 max**

- (e) 1. Population might have been very small / genetic bottleneck;  
2. Population might have started with small number of individuals /  
by one pregnant female / founder effect;  
3. Inbreeding.

*Allow any **two***

**2 max**

**[7]**

**Q7.**

- (a) 1. Kingdom, Phylum, Class, Order, Family;  
2. *Luscinia svecica*.

*1 mark for each correct column*

*Allow Genus and Species if both placed in box for  
species but not if both placed in genus box*

**2**