1. Nov/2019/Paper_41/No.9

(a) Compare the characteristic features of members of the kingdoms Fungi and Animalia. [7]

(b) Discuss the methods used in breeding programmes for endangered mammal species **and** outline the problems that may occur with these programmes. [8]

[Total: 15]

2. Nov/2019/Paper_42/No.9

(a) Compare the characteristic features of members of the kingdoms Fungi and Animalia. [7]

(b) Discuss the methods used in breeding programmes for endangered mammal species **and** outline the problems that may occur with these programmes. [8]

[Total: 15]

3. Nov/2019/Paper_43/No.9(a, b)

(a) Viruses are not included in the three domain classification system as they have different features from most organisms.

Describe the features of viruses. [8]

(b) Non-governmental organisations play a role in **global** conservation.

Discuss how **two** global non-governmental organisations contribute to conservation. [7]

[Total: 15]

4. June/2019/Paper_41/No.8

Table 8.1 shows the total number of plant species, the total number of insect species and the number of habitats in three areas, **A**, **B** and **C**.

Table 8.1

area	total number of plant species	total number of insect species	number of habitats
A	6	5	1
B	15	23	4
C	362	70	12

(a) Identify the area with the highest biodiversity.

Give reasons for your choice of area.

area .....

reasons .....

.....

.....

.....

..... [3]

(b) Identify the area that is likely to be affected the most if the environment changes.

Give a reason for your choice of area.

area .....

reason .....

.....

[1]

(c) State **one** reason why it is important to conserve biodiversity in **all** three areas.

.....

.....

..... [1]

[Total: 5]

5. June/2019/Paper_42/No.2(a, b)

(a) Fig. 1.1 is an electron micrograph showing a cross-section of a myelinated neurone.

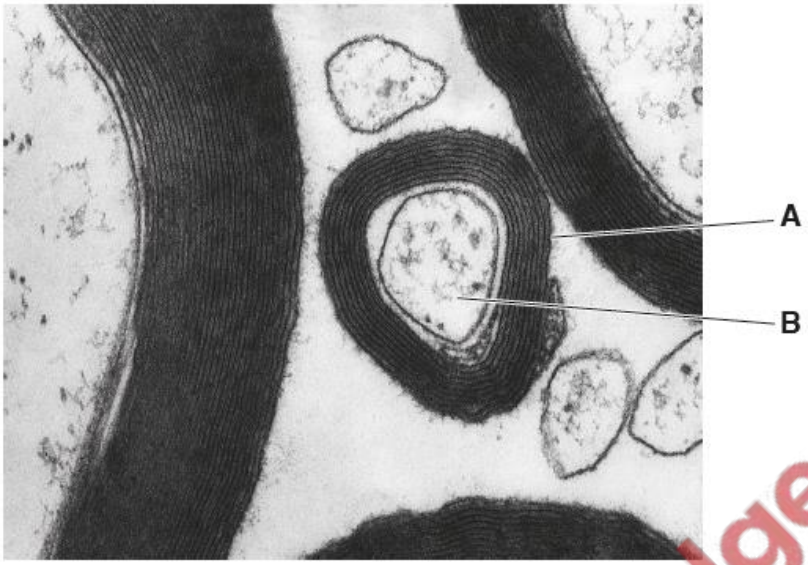

Fig. 1.1

Name **A** and **B**.

A .....

B .....

[2]

(b) Explain what is meant by saltatory conduction **and** describe its effect on the transmission of a nerve impulse.

.....

.....

.....

.....

.....

..... [3]

6. June/2019/Paper_42/No.7

(a) Define the term *ecosystem*.

.....

.....

.....

.....

.....

..... [3]

(b) State the term used to describe:

the functional role of a species within an ecosystem

.....

a reproductively isolated group of organisms that interbreed to produce fertile offspring

.....

physical factors in the environment such as temperature and soil pH.

.....

[3]

[Total: 6]

7. June/2019/Paper_42/No.9(b)

(b) Outline how degraded habitats may be restored, with reference to named examples. [7]

8. June/2019/Paper_43/No.7

The passage below outlines one method used by a student to estimate the population size of an animal species.

Complete the passage by using the most appropriate scientific term or terms.

A student estimated the population size of an animal species using the mark-release-..... technique. This can only be used for ..... animals such as mice.

The student caught a sample of mice using humane traps. The student then marked the mice in a way that did not ..... them. For example, the mark did not make them more visible to potential ..... . The student released the marked mice and left enough time for them to randomly ..... with the population.

The student then caught a second sample of mice and noted the numbers of marked and unmarked mice.

The student estimated the population size by multiplying the number of mice in the first sample by the number in the second sample, then dividing by the number of ..... mice in the second sample.

[6]

9. Feb/2019/Paper_42/No.7

(a) Explain what is meant by the term *biodiversity*.

.....

.....

.....

.....

.....

..... [3]

(b) Simpson's Index of Diversity (D) is a method of assessing biodiversity.

The formula for Simpson's Index of Diversity is:

$$D = 1 - \left(\Sigma\left(\frac{n}{N}\right)^2\right)$$

n = number of individuals of each species present in the sample
N = total number of all individuals of all species

(i) In an investigation of biodiversity in a pond, samples of pond animals were removed using sampling nets. The species of each animal was identified and the number of individuals of each species was recorded.

Table 8.1 shows the results of the investigation.

Calculate Simpson's Index of Diversity by completing Table 8.1 in the spaces provided. Record your values to three decimal places.

Write the value for Simpson's Index of Diversity on the dotted line. Record your value to three decimal places.

Table 8.1

species	number	$\frac{n}{N}$	$\left(\frac{n}{N}\right)^2$
Rana temporaria	10	0.042	0.002
Leucorrhinia dubia	35	0.148	0.022
Hydrometra stagnorum	50	0.212	0.045
Lymnaea stagnalis	44	0.186	0.035
Gammarus pulex	97		
total	236		

Simpson's Index of Diversity (D) = ...
[3]

(ii) Explain what this value for Simpson's Index of Diversity shows about the diversity of the pond.

.....

.....

.....

..... [2]

[Total: 8]