

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Q1.

The Solomon Islands are situated in the Pacific Ocean. The nearest large land mass is Australia, which is about 1500 km away. The biggest islands are mountainous, with large areas of tropical forest and a wide range of habitats. Some islands have a very high species diversity, and many species are endemic, that is they occur only in the Solomon Islands.

The table shows the total number of species on the islands in four vertebrate classes and the percentage which are endemic.

Vertebrate class	Total number of species	Endemic species / %
Mammals	53	36
Birds	223	20
Reptiles	61	16
Amphibians	17	53

- (a) How many reptile species are endemic?

(1)

- (b) Suggest an explanation for the high proportion of endemic species on the Solomon Islands.

(3)

(Total 4 marks)

Q2.

The vegetation on a large heap of waste from an old mine was investigated. The table shows the results of the measurements of certain factors in 1m² frame quadrats placed on the south-facing slope.

Quadrat	Angle of slope / °	Vegetation cover / %	Moisture content of soil / %	pH of soil
1	45	60	17.2	5.6
2	30	70	14.6	4.2
3	25	68	20.3	5.2
4	12	100	23.5	7.1
5	7	85	21.0	5.4
6	1	100	21.2	6.8

- (a) Which of the factors measured are abiotic?

(1)

- (b) Describe how the investigators could obtain the value for vegetation cover in each quadrat.

(2)

- (c) The correlation between vegetation cover and soil moisture content was tested statistically. These two factors were found to be positively correlated, and $p < 0.05$. Explain what this result means.

(2)

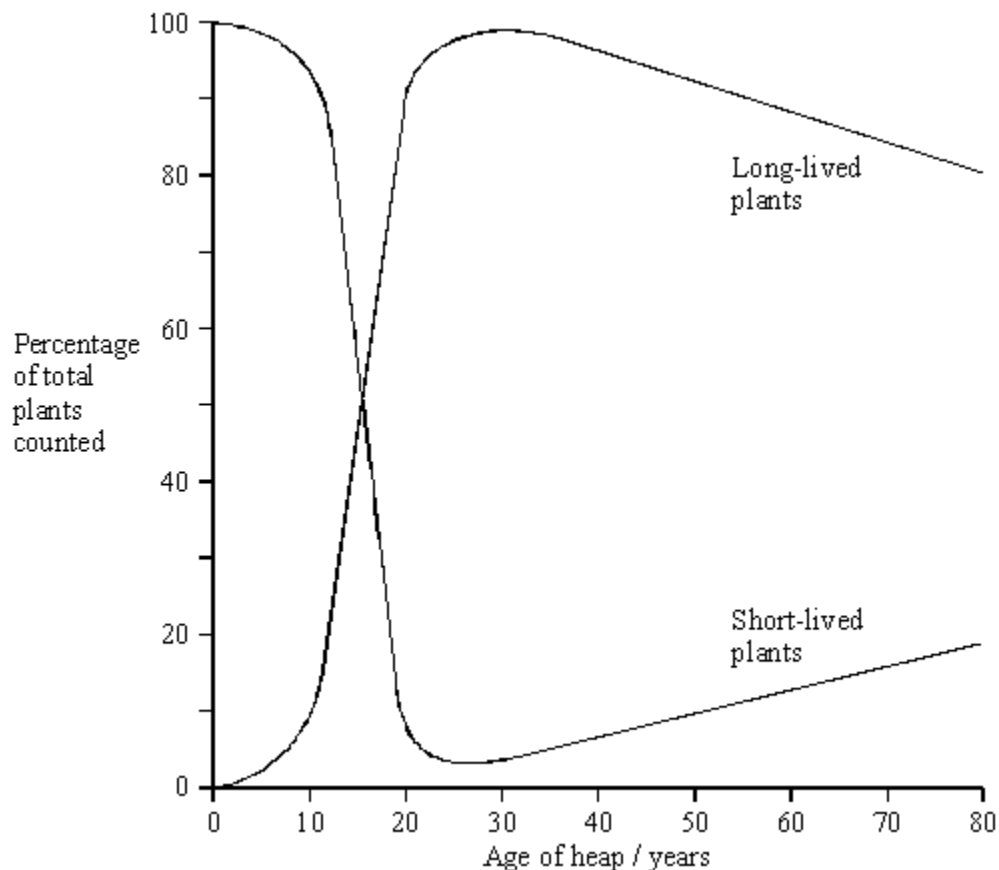
- (d) At first the waste heap had no plants growing on it. Some of the first plants to colonise it were small herbaceous plants. Explain **one** way in which colonisation by herbaceous plants could change the physical environment.

Q3.

Answers should be written in continuous prose, where appropriate.

Quality of Written Communication will be assessed in these answers.

The waste material from coal mines is deposited in pit heaps. A particular mine closed and the colonisation of an area of its pit heap was studied for a period of 80 years. Species of plants that were found growing on the pit heap were recorded in two categories, short-lived plants that grow for one or two years before dying and long-lived plants that continue to grow for several years. The graph shows the percentages of short-lived and long-lived plants on the pit heap.



(a) Using your knowledge of succession, suggest explanations for the changes in the percentages of short-lived and long-lived plants

(i) over the first 20 years;

(ii) between 30 and 80 years.

(6)

- (b) Mine waste often contains metal ions at concentrations that are toxic to plants. Populations of two species of grass, red fescue and common bent, have been found on pit heaps contaminated with zinc ions.

Describe an experiment you would carry out in order to determine which of the two species has the greater tolerance to zinc ions in the soil.

(3)

(Total 9 marks)