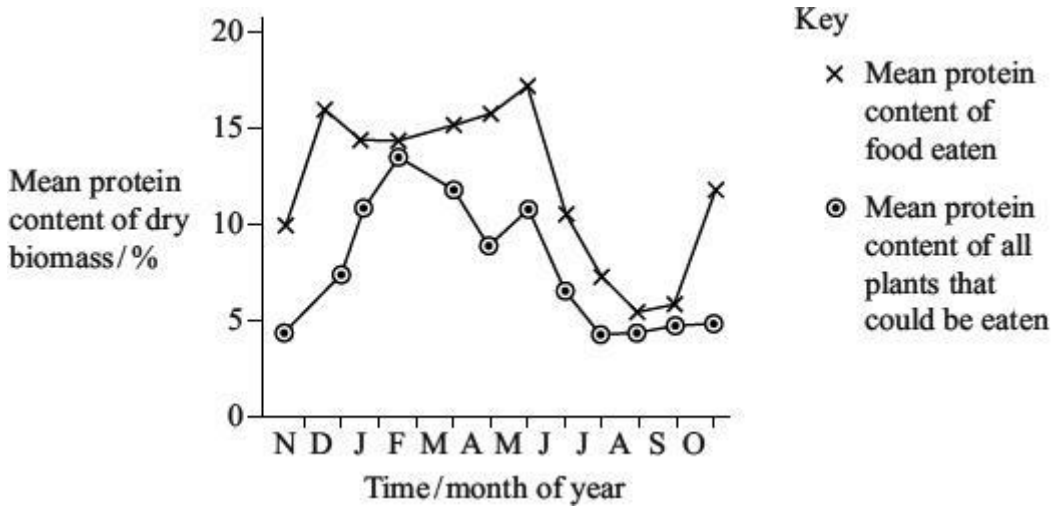
Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The wildebeest is a large mammal that lives on grasslands in Africa and feeds on a number of species of plant. A lot of rain falls from April to May and also in November. In the dry season between July and October very little rain falls.

The graph shows changes in the mean protein content of all the plants that could be eaten at different times of year. It also shows the mean protein content of the food the wildebeest actually eat.



(a) During the dry season the protein content of the plants decreases. Suggest **one** way in which a lack of rain could account for this change.

_____

_____

_____

_____

(2)

(b) Throughout the year the mean protein content of all the plants which could be eaten and the mean protein content of the food actually eaten differs. Suggest **one** explanation for this difference.

_____

_____

_____

_____

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(2)

(c) When wildebeest eat food containing less than 6% protein, they start to lose protein from their body tissues. Suggest and explain how a deficiency of **one** named protein makes the wildebeest more susceptible to being caught by predators.

_____

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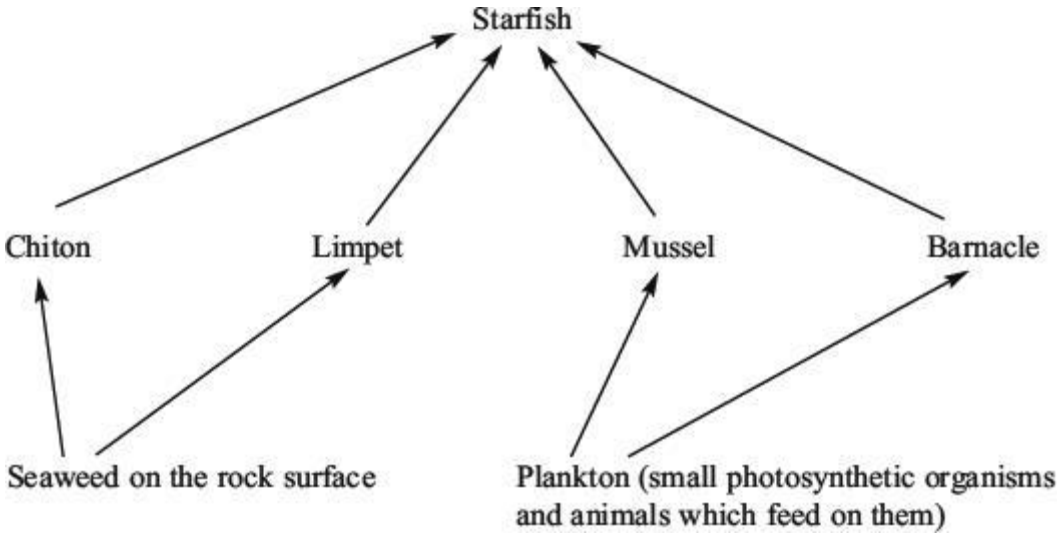
(2)

(Total 6 marks)

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Q2.

Starfish feed on a variety of invertebrate animals that are attached to rocks on the seashore. The diagram shows part of a food web involving a species of starfish.



(a) When starfish feed on mussels they leave behind the empty shell. Explain how quadrats could be used to determine the percentage of mussels that had been eaten by starfish on a rocky shore.

_____

_____

_____

_____

_____

(3)

(b) The table shows the composition of the diet of starfish.

	Prey species			
	Chitons	Limpets	Mussels	Barnacles
Percentage of total number of animals eaten	3	5	27	65
Energy provided by each species as a percentage of total energy intake	42	5	38	15

(i) The percentage of barnacles in the diet is much higher than the percentage of energy they provide. Suggest **one** explanation for this difference.

_____

(1)

(ii) The table shows that the amount of energy provided by chitons is greater than the amount of energy provided by limpets. Calculate the number of limpets a starfish would need to eat in order to obtain the same amount of energy as it would obtain from one

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chiton.

Number of limpets _____

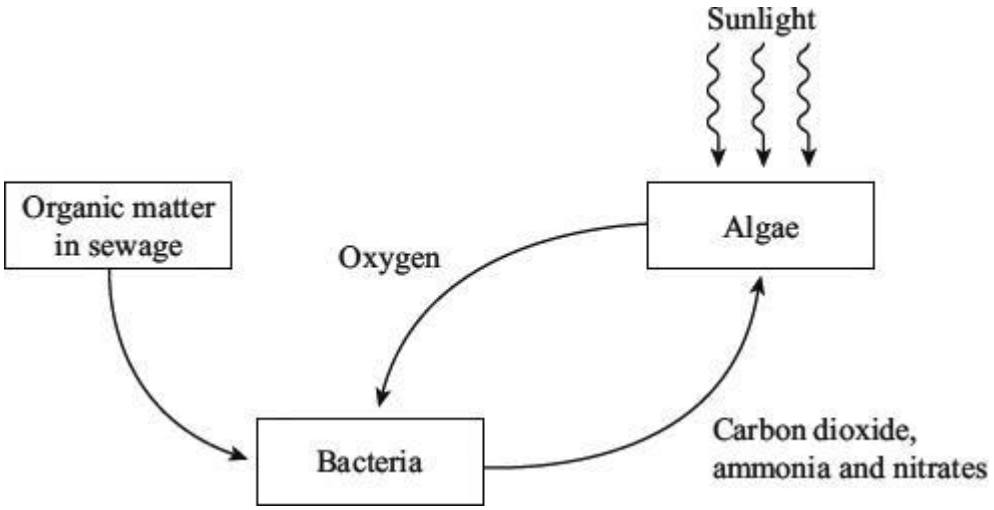
(1)

(Total 5 marks)

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Q3.

Purification ponds can be used in warm climates to break down sewage. The ponds are about 1m deep and contain bacteria and green algae. The diagram summarises the processes involved in the breakdown of sewage in a purification pond.



(a) Explain the advantage of having both algae and bacteria in a purification pond.

(4)

(b) Purification ponds only work efficiently when they are shallow and warm. Explain why.

(4)

(Total 8 marks)

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