Biology [33 marks]

Read this passage and answer the questions which follow:

Parrots - The Lost and the Last

Parrots are the most **threatened** group of birds in the world. Every year hundreds of thousands of parrots are caught for the cage-birds trade, the majority illegally, and many die before even going on sale. Combined with rapid **deforestation**, this **unsustainable** pressure has put more than one third of all parrot species at risk.

The 354 species of parrots, parakeets, cockatoos, lories and macaws comprise a well-defined group, and so form a single family, the Psittacidae, within their own order, the Psittaciformes. Many of them are brightly coloured, intelligent and some species are also excellent **mimics**, for example of the human voice. All of these characteristics have ensured that parrots are highly prized as pets, and this has played a major part in their downfall. 19 species have died out, while a few dozen more are on the verge of **extinction**.

Despite the fact that many parrots will breed readily in captivity, most of them are still trapped extensively. This is because by far the greatest diversity of species occurs in **developing** forested regions of Latin America, sub-Saharan Africa and Southeast Asia, where poverty and lax law enforcement drive a thriving bird trapping business. Wild-hatched parrots are cheaper than those reared by hand, so demand remains high.

Parrots pair for life and usually raise just one or two chicks a year, which in some species take up to 9 weeks to fledge. As with any birds that have a low **reproductive rate**, thefts of adults from the wild have a dramatic effect on populations. Chicks are stolen, too, an act which may cause irreparable damage to the tree hole nest. Sometimes pairs do not recover from this trauma. For every parrot on sale in a pet shop, several others are likely to have died en route, and so the cage-bird trade is exceptionally wasteful.

The history of Spix's McCaw offers an important case study. First described in 1832, it was only in the 1980s this species' natural home was discovered, but by then decades of trapping and habitat destruction had taken their toll and only three birds remained. These were captured in 1987 and 1988, thus making the **species** extinct in the wild. In 2000, 60 macaws were known to be alive, of which 54 hatched in captivity. Conservationists hope to return some Spix's macaws to the wild, but face two serious difficulties. The available **gene pool** of the species is small, creating the risk of **inbreeding**, and hardly any of its habitat remains.

Unlike Spix's macaw and the Carolina parakeet (which went extinct in the USA in 1918), most of the extinctions recorded among parrots to date relate to island forms. They include the Seychelles, Raiatea and Guadeloupe parakeets, Cuban and Jamaican macaws and Martinique parrot, to name but a few. Habitat loss and the pet trade, as well as hunting for food, were to blame.

Adapted from "Extinction" by George C. McGavin

Using the information in the passage and your own knowledge, answer these questions:

1. What is meant in the passage by the words indicated in bold as follows:

i.	Threatened	**vi.**	Developing	
ii.	Deforestation	**vii.**	Reproductive Rate	
iii.	Unsustainable	**viii.**	Species	
iv.	Mimics	**ix.**	Gene Pool	
v.	Extinction	**x.**	Inbreeding	[10]

2. How many extinct species are referred to in the passage? [1]

3. How many of these species lived on islands? [1]

4. What is it about islands that might make the species living on them particularly prone to extinction? [2]

5. Many scientists are worried about the effect that global warming will have on rare bird species, but this isn't mentioned in the passage. Explain how global warming might affect species:

i. that live on islands.

ii. that live in rainforests. [3]

6. "Conserving parrots is pointless - why bother?" Write a short paragraph to explain how you would convince someone who holds this view that they are wrong. [5]

7. Write down two scientific names mentioned in the passage. [1]

8. Draw a labelled parrot cell. [3]

9. Give two reasons why parrots might be so brightly coloured. [2]

10. "Parrots often live in rainforests where they have to compete with monkeys for the fruits that they eat. However monkeys will also eat leaves and sometimes even small lizards. The lizards prey on small insects which eat the same leaves as the monkeys. Eagles try to hunt monkeys but they are not usually quick enough to catch parrots." Use this information to: [1]

i. construct a food chain with four species in it [2]

ii. construct a food web with all species in it.

11. In an effort to avoid any more parrots going extinct, large sums of money are being channelled into "captive breeding" and "habitat restoration" programs. Explain what each of these involves. [2]



