BIOLOGY: Game of Thorns [33 marks]

One particular family of plants, the cacti, has **evolved** to hoard precious water and so overcome the feast or **famine** nature of desert rainfall. There are about 1500 species native to the deserts of North and South America and one species native to Africa, but as popular plants, they have been **introduced** across many other countries. By far the largest and most impressive of all is the saguaro, the classic cactus of the deserts of New Mexico and Arizona. Featured prominently in countless Western films, it can live for 150 years and grow up to 20 meters (65 feet) tall. This giant also has a clever trick. When there is a **downpour**, it is able to soak up as much as a ton of water in the following 24 hours. Having done this, the saguaro then has to protect its booty against any creature that might wish to exploit this valuable resource. It does so with a barrage of long, sharp spines over almost its entire surface.



Many of the desert's smaller inhabitants have turned the saguaro's spiny defences to their advantage, using the cacti as a fortress to keep them safe from **predators**, either living within them or fleeing to the safety of the spiny 'Forest'. But one very clever predator has learned to get around these defences. Harris's Hawk is a large, long-winged, desert-dwelling raptor that hunts **cooperatively**, rather like lions. First, a scout perched on a saguaro spots the prey, perhaps a jackrabbit eating some dried leaves. Then one or two birds fly low towards the animal, causing it to run for cover. Having reached what appears to be the safe haven of the cactus spines, the jackrabbit might think it has managed to escape, but the hunt is far from over. Now the ground crew move in, stalking through the forest of cacti, trying to flush the animal from its hiding place. If the jackrabbit stays put, it will probably escape. But if it panics and makes a break for it, the watchers will strike, plummeting down from their **vantage points** on top of the saguaro, twisting and turning through the spiny maze until one invariably grabs the animal with its lethal talons.

Harris hawks are the only one of the world's 300 or more species of day flying **raptors** that hunts co-operatively, all in response to the spiny saguaro cactus. It's this ability to cooperate that makes Harris hawks popular amongst falconers, being easy to train and quick to learn.

Another, much smaller predator, the loggerhead shrike, also takes advantage of the saguaro's spines. It uses them to hold and store its victims. It is a songbird but with a fearsomely hooked bill and a preference for small birds, large **insects**, amphibians, reptiles and rodents. Like other shrikes, it frequently impales its larger victims onto thorns and spikes, sometimes to **dismember** them more easily but also to store them. This habit has earned it the name butcher bird - an apt description.



Adapted from "Planet Earth II" by Stephen Moss and David Attenborough.

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.	Evolved	vi.	Cooperatively	
ii.	Famine	vii.	Vantage Points	
iii.	Introduced	viii.	Raptors	
iv.	Downpour	ix.	Insects	
v.	Predators	x.	Dismember	[10]

2. Describe three ways in which the Saguaro cactus is adapted to living in the American deserts. [3]

3. Name two birds and two mammals mentioned in the passage. [4]

4. Describe two differences between reptiles and amphibians. [2]

5. Would you expect amphibians (like frogs) or reptiles (like lizards) to be more common in the desert? Explain why. (Hint: think of life cycles) [2]

6. Write down a food chain that involves the Harris Hawk. [2]

7. Desert organisms are often popular with people. Describe how we have used each of the following outside their natural environment and explain why:

i) Desert Cacti

ii) The Harris Hawk [2+2]

8. Pick any **<u>one</u>** habitat type you like and describe in as much detail as you can how its animals **and** plants are adapted for living there. (Hint: possible habitats you *might* choose are Rainforests *or* Polar Regions *or* Woodlands *or* Streams & Rivers, etc.) [6]