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https://www.100test.com/kao_ti2020/462/2021_2022__E9_98_85_E8_AF_BB_E8_BE_85_E5_c81_462959.htm the code of

Hammurabi Hammurabi was the ruler who chiefly established the greatness of Babylon, the worlds first metropolis. Many relics of Hammurabis reign ([1795-1750 BC]) have been preserved, and today we can study this remarkable King....as a wise law-giver in his celebrated code. . .by far the most remarkable of the Hammurabi records is his code of laws, the earliest-known example of a ruler proclaiming publicly to his people an entire body of laws, arranged in orderly groups, so that all men might read and know what was required of them. The code was carved upon a black stone monument, eight feet high, and clearly intended to be reared in public view. This noted stone was found in the year 1901, not in Babylon, but in a city of the Persian mountains, to which some later conqueror must have carried it in triumph. It begins and ends with addresses to the gods. Even a law code was in those days regarded as a subject for prayer, though the prayers here are chiefly cursings of whoever shall neglect or destroy the law. Yet even with this earliest set of laws, as with most things Babylonian, we find ourselves dealing with the end of things rather than the beginnings. Hammurabis code was not really the earliest. The preceding sets of laws have disappeared, but we have found several traces of them, and Hammurabis own code clearly implies their existence. He is but reorganizing a legal system long established. Plant adaptation to the

desert(背景材料)Cactus adaptations. The secret to the superior endurance of cacti lies in their adaptations. Over millions of years, through natural selection, only the strongest and best adapted species survived. As you know, it is very dry in the desert. Plants that adapt to this are known as xerophytes (from xeros, dry and phyton, plant). There are plants that avoid the dry season by sprouting from seed just after the spring rain and growing very fast so that by the time the dry season comes, they have already produced a lot of seeds and died. These seeds lie on the soil for the dry season and sprout again in spring and the cycle repeats. Other xerophytes simply drop their leaves and stay dormant for the winter. But there is another special type of xerophyte which stores water in its fleshy tissues. Such plants are called succulents (from succus, juicy). The cactus is a typical example of a succulent. If you cut a cactus open, you see a juicy, slimy tissue. This is where the moisture is stored for the dry season. The part between the middle circle (or pith) and just under the very green part of the plant (or palisade parenchyma) just under the skin is allocated for the storage of water and food for the plant. This is a type of spongy parenchyma and can take up up to 85% of the plants volume. This is a major adaptation in the desert. Because the plant remains completely alive during the dry season and there is no need for it to dry up and lose everything, makes it possible for the plant to grow to large sizes. Another advantage is that the plant retains supplies (in the form of starch) for the winter so that it can flower right away in spring without accumulating more supplies (as most plants need to do in spring). The whole purpose of storing supplies

for the winter is mostly to energize flowering in spring but it also lets the cactus start growing much sooner. Flowering plants breathe and transpire (evaporate water from their surface) through closeable microscopic pores called stomates on the leaves or stems. To do this, their pores have to be open. In most plants these are open all day and on warm nights. But for cacti this is inconvenient as in daytime it is very hot and thus the plant would lose a lot of water through evaporation. So the cactus must close them in the daytime. But then it cannot breathe or photosynthesize (the process where sugars are made from carbon dioxide and water and releasing oxygen using the sun's energy). Succulents have an adaptation to that. Their stomates are closed during the day and are open at night, when it is not that hot and store carbon dioxide in its tissues as crassulic acid and then turn it back to carbon dioxide in the daytime. This process is called crassulic acid metabolism or CAM and it is a very smart way of respiring in the desert. If we look at the outside of the plant, we notice that there is a tough leathery skin covering the plant, we can also notice the presence of ribs and spines and sometimes fur. These are all very smart adaptations. They serve mainly for surviving heat but are also used as defense. The tough leathery skin is very impermeable to water, thus reducing evaporation from the surface of the plant. This skin often has a layer of plant wax on it which is often lightly coloured (*Pilosocereus azureus* is an example of a plant with such wax), white or blue. This reflects light and also reduces evaporation from the inside. The ribs are special structures that are also used for enduring extreme heat. The ribs (and spines) trap wind

so that the plant is enveloped in a layer of extremely still air, and this is a very important factor in reducing evaporation. On a very windy days even the ribs dont help and cacti sometimes wilt because of high water loss. The spines have different functions. They not only help shade the plant from the sun but are also known to help the cactus absorb water. They do it like this. On cool nights, dew settles on the spines of the plant. The spines are actually known to draw 0droplets of water towards the areole (the point out of which the spines grow) and here the 0droplets are absorbed. You can try this at home. Spray the plants with a very fine mist of water and watch what happens to the 0droplets that settle on the spines. They literally get attracted to the areole along the spine. The spines structure allows them to do this. Even spines pointing downwards seem to suck the 0droplets up themselves. Adaptation features are visible in this *Pilosocereus glauchochorous*. Notice the spines, ribs, fur and wax (the blue coloration). The top of a typically adapted plant. Some plants have fur, sometimes all over the plant, sometimes only near the top. This fur shades the plant even further and is also known to attract water towards the areole. Some plants only have fur near the top. This is very beneficial because the top of the plant is very sensitive to sunlight, new tissues get formed there. Young areoles, with their spines not even wooded yet can get dried up completely in the sun. When an areole is born near the top of the plant, it starts developing spines. At this time the fur appears as well. This fur accompanies the areole as it moves down the plant, shading the growing point inside. By the time the areole is about 15cm away from the top, the fur wears

out completely and the now inactive areole gets exposed to the sun. As for the roots of cacti, they are also fully adapted to living in the desert. Some species (especially plants from very dry deserts) have very shallow root systems that spread very far from the plant. This way the plant can take advantage of tiny amounts of moisture from dew or light rain as the roots spread far away and are very shallow (less than 10cm deep while spreading up to 5 metres from the parent plant). On the other hand, some cacti send their roots deep down (like many Echinocacti) to reach the ground water. Rainforest cacti often have aerial roots that can collect water all the time when it rains (and it rains very often in South American forests). The shape of cacti itself is an adaptation. You may have noticed that cacti have a barrel like or candle like shape. This allows for maximum internal volume with a minimum surface area, which is also very smart adaptation as a cactus can store a lot of water and have a small external surface area to reduce water loss. 100Test 下载频道开通，各类考试题目直接下载。详细请访问 www.100test.com