

Read the text about the yakhchāl, an early form of technology used to store food and ice long before electricity was invented. Then choose the correct answer (A, B, C or D) for each question (1-6). Put a cross (☒) in the correct box on the answer sheet. The first one (0) has been done for you.

The ancient refrigerator

In case someone ever tries to argue that ancient human civilizations were less advanced when compared to modern-day humanity, we've gathered some examples in favour of the ancients. They were, many a time, ingenious in the type of technology they came up with and employed in their everyday life.

Take the Incas, for example, who did not have a developed alphabetic system for writing but had the quipu, a counting device of knots and strings that enabled them to keep track of population records and livestock and even recaptured essential episodes of their folklore.

When it comes to engineering, architectural wonders are omnipresent on almost every continent, whether that be the pyramids of Egypt, Angkor Wat of the Khmer Empire, or even entire underground cities such as Derinkuyu in Turkey's Cappadocia region. One great example of smart and sustainable engineering brings us to the Middle East, a realm noted for being one of the cradles of civilization and developing human cultures. There, around the 4th century B.C., the ancient Persians came up with what is known as a yakhchāl.

The yakhchāl did not serve as a burial ground or a place to accommodate people; instead it fulfilled another important function in the scorching summers. With excessive heat and arid climate, the region had inhabitants, the ancient Persians, who needed some way to cool off and store food during the summer months, and that's when yakhchāls were found to be of great help. The word stands for "ice pit." These edifices provided both space and conditions to store not only ice but also many types of food that would otherwise quickly spoil at hot temperatures.

On the outside, a yakhchāl structure dominates the skyline with its domed shape, and on the inside, it would typically integrate an evaporation cooler system that allowed the ice and food resources to stay cool or even frozen while stored in the structure's underground rooms. It may sound a bit far-fetched that the ancient Persians saved ice in the middle of the desert, but their technique was, in essence, not so complicated.

A typical yakhchāl edifice would rise some 60 feet, and on the inside it would contain vast spaces for storage. The leading examples point to figures such as 6,500 cubic yards in volume. The evaporative cooling system inside the structures functioned through wind catchers and water brought from nearby springs via qanāts, common underground channel systems in the region, designed to carry water through communities and different facilities.

The evaporative cooling allowed temperatures inside the yakhchāl to decrease with ease, giving a chill feeling that you were indeed standing inside one big refrigerator. The walls of it were constructed intelligently as well, with usage of special mortar that provided super insulation and protection from the hot desert sun. It was a mix of sand, clay, and other components such as egg whites and goat hair among others.

The structures also contained trenches at the bottom, designed to collect any water coming from molten ice. Once collected, this water was then refrozen during night time, making maximum use of the resource as well as the cold desert night temperatures. It was a repetitive process.

Not only did the yakhchāls provide basic food resources, treats, and ice for the royals and high state officials, but the service was so attainable that even the poorest of society could access it.

- 0 One particular ancient civilization counted their people
- A to plan the use of resources.
 - B using paper documents.
 - C for military purposes.
 - D although they lacked a written language.
- 1 In ancient times, the yakhchāl was
- A located in a place famous for its landscape.
 - B one of a few naturally formed historic sites.
 - C developed in cooperation between peoples.
 - D one of many cases of clever inventions.
- 2 The yakhchāl's cooling effect
- A was affected by extreme weather.
 - B improved with rising outside temperatures.
 - C was able to cope with the annual hot season.
 - D decreased over the course of time.
- 3 The yakhchāl's basement
- A served as the chamber for the supplies.
 - B was its most striking architectural feature.
 - C had especially thick walls.
 - D held the tombs of Persian kings.
- 4 The technology that created the cold temperatures inside the yakhchāl
- A was also used in Persian homes.
 - B depended on some airflow.
 - C had one major weakness.
 - D required complex food preservation procedures.
- 5 The building material which kept the heat out
- A also reduced outside noise.
 - B was also used for skin protection.
 - C contained animal products.
 - D was delivered on efficiently planned routes.
- 6 Channels located in the lowest part of the yakhchāl
- A were used to treat unclean water.
 - B made sure that no liquid would be wasted.
 - C gathered waste that might pollute ground water.
 - D caught liquid to use for watering farmland.

