Part 3

Read the article on The First Fires and answer Questions 26 - 45.

The First Fires

Humanity's first and, perhaps, most significant advance towards life-improving technology was the control of fire.

An early man saw fire as a heavenly gift that came in the form of lightning, forest fires, and even lava flows. Because they were unable to create their fire, early humans probably stored it in the form of slow-burning logs or pots of charcoal.

It's unclear how or where humans first discovered the ability to create flames out of thin air. It was most likely an incidental discovery made when working with wood or stone to make other tools. Prehistoric cultures' fire-making practices point to friction as the first known ignition technique. Europe's rural peasants would use a wooden drill and vigorously spin it between their hands to make holes in the ground. A cable wrapped around the drill and pulled on both ends might expedite the procedure.

The Greeks employed lenses or concave mirrors; the Aztecs of Mexico and the Chinese also utilized burning glasses. Paleolithic toolmakers found that chipping flints created sparks and began using percussion techniques of lighting fires. Five thousand years ago, the discovery of iron made the process more effective. The Eskimos of Arctic North America used a sulphur-containing substance called iron pyrites to create a slow-burning spark. The Chinese used porcelain and bamboo to start their fires. The use of steel, flint, and tinder to start a fire in Europe remained the primary way of creating a fire until the mid-19th century. Phosphorus, discovered in 1669 by a German alchemist attempting to turn silver into gold, revolutionized fire lighting. Several 17th-century chemists were impressed by the element's combustibility and employed it to make fire-lighting devices, but the products were dangerously inflammable. The first matches were prohibitively costly due to the high cost of phosphorus, which weighed several hundred pounds per ounce.

After 1781, when a group of French scientists invented the Phosphoric Candle or Ethereal Match, a sealed glass tube containing a twist of paper topped with phosphorus, the search for a suitable match truly got on. Because of the sudden influx of fresh air when the tube ruptured, the phosphorous ignited of its own will. The Instantaneous Light Box, a container filled with sulphuric acid, into which splints coated with chemicals were dipped, was famous in the United States.

In 1827, an English chemist named John Walker used a military rocket-recipe maker to create the first modern matches. Congreves were splints covered with sulphur and capped with potassium chlorate that cost a shilling a box. The user drew them swiftly through a folded sheet of glass paper to ignite them.

When Walker did not patent his design, Samuel Jones began selling Lucifers three years later. Around the same time, Charles Sauria, a French chemical student, invented the first "strike-anywhere" match by replacing the potassium chlorate in the Walker formula with white phosphorus. Unfortunately, from 1845, matchmakers exposed to the white phosphorus vapors died of necrosis, a condition that eats away the jawbones. However, the drug wasn't officially outlawed until 1906.

After Pasch discovered non-toxic, red, or amorphous phosphorus in 1885, his countrymen J E Lundstrom began using it commercially. While traditional safety matches included potassium chlorate with an igniting temperature of 182 degrees centigrade, Lundstrom's used non-toxic red phosphorus painted onto the striking surface instead.

When it came to meeting technology and safety regulations, the United States was much behind the rest of the world. For example, although it wasn't until 1900 that the Diamond Match Company purchased a French patent for safety matches, it took experts another 11 years to modify this mix for the United States because of different climatic circumstances.

Several "firsts" in match technology and marketing may be attributed to the American side. The Diamond Match Company first introduced book matches in 1892. The invention took off when a brewery came up with the original notion of promoting its goods in matchbooks in 1896. It is estimated that 90% of hotels, restaurants and other establishments in the United States give away complimentary book matches to guests.

In addition to the anti-afterglow solution, the waterproof match, which lights up after eight hours in the water, was invented in the United States to prevent the game from smoldering after it has been blown out.

Questions 26 - 30

Read the statements below. Decide whether they are TRUE, FALSE or NOT GIVEN according to the text.

Mark a cross for the correct answer ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

		True	False	Not Given
26	In the old time, human considered fire as a punishment from God.	☐	☐	☐ (1)
27	Friction was known to be the first technique of ignition.	☐	☐	☐ (1)
28	The first matches cost more than a house in old days.	☐	☐	☐ (1)
29	Samuel Jones stole Walker's design and launched his product called Lucifers.	☐	☐	☐ (1)
30	Book matches became popular and greatly accepted in 1892.	☐	☐	☐ (1)

(Total for Questions 26 - 30 = 5 marks)

Questions 31 - 40

Complete the following sentences using no more than THREE words that must be taken from one point in the text.

31	The early human decided to keep the fire in ……because they did not know how to create it (1)

32	No one acknowledged the first discovery of flames but thought it was possibly …….. at work. **(1)**
33	A wooden drill was a way of ignition used often by …….. **(1)**
34	Following the invention of Phospheric Candle, a search for …… became more serious. **(1)**
35	Instantaneous Light Box that is a box full of ……. became popular in the United States. **(1)**
36	One of the famous matches sold in 1827, a box with splints covered with Sulphur only cost …… each **(1)**
37	Charles Sauria's Strike Anywhere match was the invention that used …… instead of potassium chlorate. **(1)**
38	It cost the scientists in Diamond Match Company …… to come up with the new formula for the United States. **(1)**
39	Around …… of accommodations and restaurants provided free book matches to their customers. **(1)**
40	The latest invention, the waterproof match, could be ignited …… In a wet condition. **(1)**

(Total for Questions 31 - 40 = 10 marks)

Questions 41 - 45

Complete this summary of the text using words from the box below. Each word may be used once or not used at all

In ancient Greek, people used **(41)** …… to focus the sunlight. Later around 5,000 years ago **(42)** …….. was discovered and made such process easier and more **(43)** …… Even though there were a number of methods used by different groups of people around the world, steel, flint, and tinder were still the **(44)** …… method of ignition in Europe. Later in late 17th century, phosphorus was found by German**(45)** ……

glasses	toolmakers	primary	alchemist	iron
mirrors	effective	lighting	inflammable	fire

(Total for Questions 41 - 45 = 5 marks)

TOTAL FOR PART 3 = 20 MARKS