READING PASSAGE 2

*You should spend about 20 minutes on **Questions 14–26**, which are based on Reading Passage 2 below.*

Roller coaster: the great fairground attraction

How they move

Like a passenger train, a roller coaster consists of a series of connected cars that move on a track. But unlike a passenger train, it has no engine or power source of its own. For most of the ride, it is moved only by the forces of inertia and gravity. The only exertion of energy occurs at the very beginning of the ride when the coaster train is pulled up the lift hill.

The traditional lifting mechanism is a long length of chain running up the hill under the track. The chain is fastened in a loop, which is wound around a gear at the top of the hill and another one at the bottom. The gear at the bottom of the hill is turned by a motor. This turns the chain so that it continually moves up the hill like a long conveyor belt. The coaster cars grip onto the chain, which simply pulls them to the top. At the summit, the train is released and starts its descent.

The purpose of this initial ascent is to build up a sort of reservoir of potential energy, which simply means that as the coaster gets higher in the air, there is a greater distance gravity can pull it down.

As the train starts coasting down the hill, this potential energy is converted into kinetic energy (energy of motion), and the train speeds up. At the bottom of the hill, this has reached its maximum, and this propels the train up the second hill, again building up the potential-energy level.

In this way, the course of the track is constantly converting energy from kinetic to potential and back again. This fluctuation in acceleration is what makes roller coasters so much fun. At its most basic level, this is all a roller coaster is – a machine that uses gravity and inertia to send a train along a winding track.

Coasting through history

Roller coasters have a long, fascinating history. Their direct ancestors were ice slides, popular in Russia in the 16th and 17th centuries. They consisted of a long, steep, wooden slide covered in ice. Riders walked up a ladder or set of stairs to the top of the slide, as high as 21 metres up. At the top, they climbed into sleds made of wood or blocks of ice and shot down the slope. At the base, the sleds would crash-land in a sand pile.

It seems that the idea was then imported into France. For most of the year, the warmer climate would melt the ice, so the French started building waxed slides instead. To help the sleds move down these slides, they added wheels, and in 1817, for the first time, a train was attached to the track. The French continued to expand on this idea, coming up with more complex track layouts, with multiple cars and all sorts of twists and turns.

The first American roller coaster was built in the mountains of Pennsylvania in the mid-1800s, originally to provide an easy way to send coal to the railway 29 km down the mountain. When the track was first built, a crew at the bottom of the mountain would attach the cart to a team of mules after emptying the load, and the mules would drag it back up to the top. They were eventually replaced with steam engines to make the system more efficient.

Soon after these improvements were made, the railway company built a new tunnel that brought the freight trains much closer to the coal mine. No longer required for its original purpose, the roller coaster was configured as a ‘scenic tour’. For one dollar, tourists got a leisurely ride up to the top of the mountain, followed by a wild, bumpy ride straight down. This was soon a resounding success, attracting thousands of tourists every year.

Scenic rides like this continued to thrive and were joined by wooden roller coasters similar to the ones we know today. These coasters were the main attraction at popular amusement parks throughout the United States, such as the many parks of Coney Island in New York. By the 1920s, roller coasters were in full swing, with some 2,000 rides in operation around the country.

Following the Great Depression, a decline in roller-coaster production began in the early 1930s, but a second roller-coaster boom in the 1970s and the beginning of the 1980s revitalised the amusement-park industry and introduced a slew of innovative tubular steel coasters.

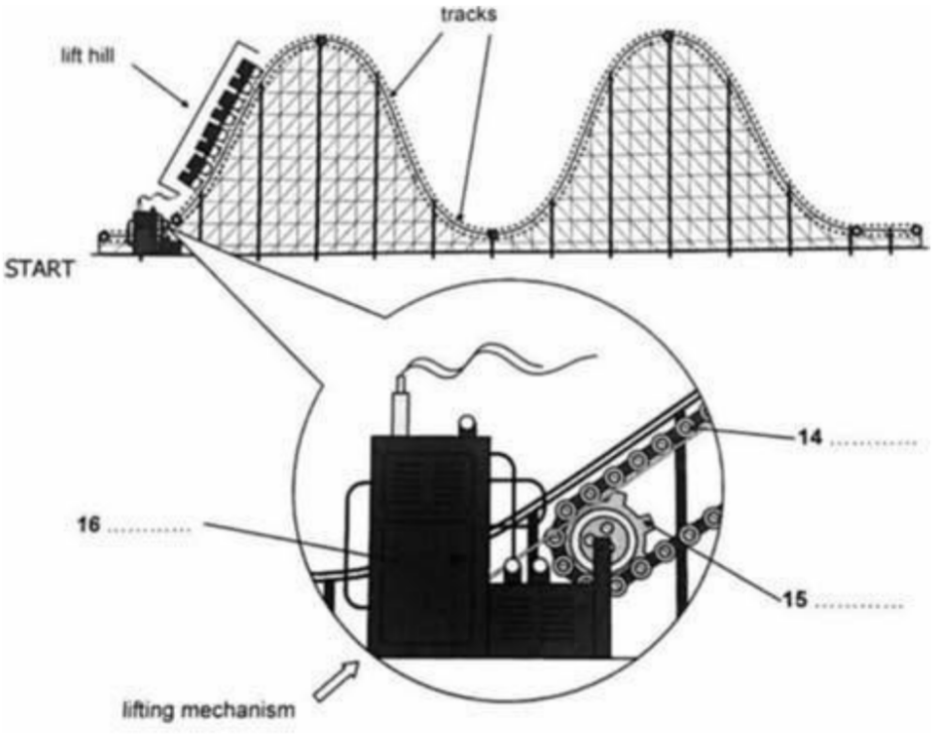
This was followed by a decline in interest for the rest of the decade, but since the early 1990s the amusement-park industry has experienced another coaster boom of sorts. New launching techniques and other technological developments have opened up a world of options for designers, so in some rides you feel as if you are flying. In the next few years we can expect to see many faster, taller and more twisted rides popping up in amusement parks around the world.

Questions 14–16

Label the diagram below.

*Choose **ONE WORD ONLY** from the passage for each answer.*

Write your answers in boxes 14–16 on your answer sheet.



Questions 17–21

Complete the summary below.

*Choose **NO MORE THAN TWO WORDS** from the passage for each answer.*

Write your answers in boxes 17–21 on your answer sheet.

History of roller coasters

- Modern roller coasters are descended from 16th-century Russian slides with a surface of **17** _____.
- In France, because of the higher temperatures, the wooden surface on the slides was **18** _____, and **19** _____ were attached to the cars to ease the descent.
- The first US roller coaster was used for transporting **20** _____ down a mountainside in carts.
- Initially, these were pulled by mules, but in time power was produced by **21** _____.

Questions 22–26

Do the following statements agree with the information given in Reading Passage 2?

In boxes 22–26 on your answer sheet, write

TRUE	*if the statement agrees with the information*
FALSE	*if the statement contradicts the information*
NOT GIVEN	*if there is no information on this*

22 The earliest modifications to the basic slide were made in France.

23 Roller coasters continued to increase in popularity throughout the 1920s and 1930s.

24 New roller-coaster technology was introduced in the 1970s in response to public demand.

25 Roller coasters were less popular for most of the 1980s than in the 1970s and 1990s.

26 The design of roller-coaster rides became more varied in the 1990s.

题号	答案	定位与解释
14	chain	第二段 “*The traditional lifting mechanism is a long length of **chain** running up the hill under the track.*” 这里明确说明提升装置的主体是一条链条，示意图中 14 指向由许多环节组成的条状物，对应 chain。
15	gear	同段 “*…wound around a **gear** at the top of the hill and another one at the bottom.*” 图中 15 指向带齿的圆轮，对应 gear。
16	motor	同段 “*The gear at the bottom of the hill is turned by a **motor**.*” 放大图黑色方形箱体即为驱动电机。
17	ice	“Their direct ancestors were ice slides, popular in Russia… with a surface of **ice**.”（首段 “Coasting through history” 部分首句）
18	waxed	“the warmer climate would melt the ice, so the French started building **waxed** slides instead.”
19	wheels	“To help the sleds move down these slides, they added **wheels**…”
20	coal	“…built in the mountains of Pennsylvania … to send **coal** to the railway 29 km down the mountain.”
21	steam engines	“They were eventually replaced with **steam engines** to make the system more efficient.”
22	TRUE	法国的确首先对原始滑道做出改良：加蜡、加轮子、加车厢；见第二段首句。
23	FALSE	1920 年代火热，但文中说 “a decline … began in the early 1930s”。持续增长并未贯穿 1930 年代。
24	NOT GIVEN	文中只说 1970-80 年代出现第二次热潮和 “innovative tubular steel coasters”，并未说明是 “响应公众需求”。
25	TRUE	“This was followed by a decline in interest for the rest of the decade” 指 1980 年代大部分时间兴趣下降；70 年代和 90 年代均为热潮。
26	TRUE	“New launching techniques… opened up a world of options for designers” → 90 年代设计更加多样，故为 TRUE。