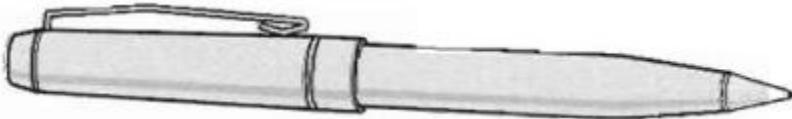


## READING PASSAGE 1

You should spend about 20 minutes on Questions 1-13, which are based on Reading Passage 1

### The history of the biro

A One chilly autumn morning in 1945, five thousand shoppers crowded the pavements outside Gimbel's Department Store in New York City. The day before, Gimbel's had taken out a full-page newspaper advertisement in the New York Times, announcing the sale of the first ballpoint pens in the United States. The new writing instrument was heralded as "fantastic ... miraculous ... guaranteed to write for two years without refilling!" Within six hours, Gimbel's had sold its entire stock of ten thousand ballpoints at \$12.50 each - approximately \$130 at today's prices.



B In fact, this 'new' pen was not new after all, and was just the latest development in a long search for the best way to deliver ink to paper. In 1884 Lewis Waterman had patented the fountain pen, giving him the sole rights to manufacture it. This marked a significant leap forward in writing technology, but fountain pens soon became notorious for leaking. In 1888, a leather tanner named John Loud devised and patented the first "rolling-pointed marker pen" for marking leather. Loud's design contained a reservoir of ink in a cartridge and a rotating ball point that was constantly bathed on one side with ink. Loud's pen was never manufactured, however, and over the next five decades, 350 additional patents were issued for similar ball-type pens, though none advanced beyond the design stage. Each had their own faults, but the major difficulty was the ink: if the ink was thin, the pens leaked, and if it was too thick, they clogged. Depending on the climate or air temperature, sometimes the pens would do both.

C Almost fifty years later, Ladislas and Georg Biro, two Hungarian brothers, came up with a solution to this problem. In 1935 Ladislas Biro was working as a journalist, editing a small newspaper. He found himself becoming more and more frustrated by the amount of time he wasted filling fountain pens with ink and cleaning up ink smudges. What's more, the sharp tip of his fountain pen often scratched or tore through the thin newsprint paper. Ladislas and Georg (a chemist) set about making models of new pen designs and creating better inks to use in them. Ladislas had observed that the type of ink used in newspaper printing dried rapidly, leaving the paper dry and smudge-free. He was determined to construct a pen using the same type of ink. However, the thicker ink would not flow from a regular pen nib so he had to develop a new type of point. Biro came up with the idea of fitting his pen with a tiny ball bearing in its tip. As the pen moved along the paper, the ball bearing rotated and picked up ink from the ink cartridge which it delivered to the paper.

**D** The first Biro pen, like the designs that had gone before it, relied on gravity for the ink to flow to the ball bearing at the tip. This meant that the pens only worked when they were held straight up, and even then the ink flow was sometimes too heavy, leaving big smudges of ink on the paper. The Biro brothers had a rethink and eventually devised a new design, which relied on capillary action rather than gravity to feed the ink. This meant that the ink could flow more smoothly to the tip and the pen could be held at an angle rather than straight up. In 1938, as World War II broke out, the Biro brothers fled to Argentina, where they applied for a patent for their pen and established their first factory.

**E** The Biros' pen soon came to the attention of American fighter pilots, who needed a new kind of pen to use at high altitudes. Apparently, it was ideal for pilots as it did not leak like the fountain pen and did not have to be refilled frequently. The United States Department of War contacted several American companies, asking them to manufacture a similar writing instrument in the U.S. Thus fortune smiled on the Biro brothers in May 1945, when the American company 'Eversharp' paid them \$500,000 for the exclusive manufacturing and marketing rights of the Biro ballpoint for the North American market. Eversharp were slow to put their pen into production, however, and this delay ultimately cost them their competitive advantage.

**F** Meanwhile, in June 1945 an American named Milton Reynolds stumbled upon the Biro pen while on vacation in Buenos Aires. Immediately seeing its commercial potential, he bought several pens and returned to Chicago, where he discovered that Louis' original 1888 patent had long since expired. This meant that the ballpoint was now in the public domain, and he, therefore, wasted no time making a copy based on the Biro design. Establishing his pen company with just \$26,000, Reynolds quickly set up a factory with 300 workers who began production on 6th October 1945, stamping out pens from precious scraps of aluminum that hadn't been used during the war for military equipment or weapons. Just 23 days later, it was Reynolds' ballpoint pen that caused the stampede at Gimbel's Department Store. Following the ballpoint's debut in New York City, Eversharp challenged Reynolds in the law courts, but lost the case because the Biro brothers had failed to secure a U.S. patent on their invention.

## Questions 1-6

The reading passage has six paragraphs **A-F**.

Choose the most suitable heading for each paragraph from the list of headings below.  
Write the correct number i-ix in your answer sheet.

### List of Headings

- i. Fountain pens are history.
- ii. Fame at last for the Biro brothers.
- iii. A holiday helps bring the biro to America.
- iv. A second design and a new country.
- v. War halts progress.
- vi. Dissatisfaction leads to a new invention.
- vii. Big claims bring big crowds.
- viii. A government request brings a change of ownership.
- ix. Many patents and many problems.

- 1 Paragraph A
- 2 Paragraph B
- 3 Paragraph C
- 4 Paragraph D
- 5 Paragraph E
- 6 Paragraph F

## Questions 7-9

Choose the correct answer, **A, B, C or D** and write in your answer sheet from 7-9

- 7. The problem with the ballpoint pens invented between 1888 and 1935 was that
  - A. they cost a great deal of money to manufacture.
  - B. the technology to manufacture them did not exist.
  - C. they could not write on ordinary paper.
  - D. they were affected by weather conditions.
- 8. The design of the Biro brothers' first pen
  - A. was similar to previous pens.
  - B. was based on capillary action,
  - C. worked with heavy or light inks.
  - D. worked when slanted slightly.
- 9. Milton Reynolds was able to copy the Biro brothers' design because
  - A. the Biro brothers' original patent was out of date.
  - B. it was legal to copy other designs at the time.
  - C. they did not have a patent for North America.
  - D. the Biro brothers gave him permission.

### **Questions 10-12**

*Answer the questions below using **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.*

*Write your answers from 10-12 in your answer sheet*

10. What material was the first ballpoint pen designed to write on? \_\_\_\_\_
11. Where did the Biro brothers open their first factory? \_\_\_\_\_
12. In what year did the first American biro factory begin production? \_\_\_\_\_