READING PASSAGE 1

*You should spend about 20 minutes on **Questions 1–13**, which are based on Reading Passage 1 below.*

The history of the bar code

The first step toward today's bar codes came in 1948, when Bernard Silver, a graduate student in the USA, overheard a conversation in the halls of Philadelphia's Drexel Institute of Technology. The president of a food chain was pleading with a professor to undertake research on a method of capturing product information automatically at store checkouts. The professor turned down the request, but Bernard Silver mentioned the conversation to his friend Norman Woodland, a twenty-seven-year-old teacher at Drexel.

The problem fascinated the two friends, and they set about thinking of a solution. Their first idea was to use patterns printed with an ink that would glow under ultraviolet light, and they built a device to test the concept. It worked, but the printing costs were high and the patterns faded over time. Nonetheless, they were convinced they had a workable idea. After several months of work they came up with the linear bar code, using elements from two established technologies: Morse code, in which letters and numbers are coded into a system of dots and dashes, and the method used to record soundtracks in movies. Silver and Woodland patented the idea in 1952, describing their invention as 'article classification… through the medium of identifying patterns'. But the cost, together with the fact that their scanning equipment was rather unreliable, made the idea a non-starter at that time.

Scanning systems made little progress until the 1970s, when lasers became affordable. Following this, various systems came into use around the world in stores, libraries, factories, and the like, each with its own proprietary code, but there was no standardization. A consortium of grocery manufacturers and retailers therefore set up a committee to look into bar codes, and to standardize what became known formally as the Universal Product Code (UPC). At the heart of the committee's guidelines were a few basic principles. To make life easier for the cashier, bar codes would have to be readable from almost any angle and at a range of distances. Because they would be reproduced by the million, the labels would have to be cheap and easy to print. And to be affordable, automated checkout systems would have to pay for themselves in two and a half years.

The committee considered more than a dozen versions of bar codes, including one based on multi-colored dots and another using a circular bull's-eye design with lines radiating from a central point. On April 1, 1973, they unanimously agreed on a standardized UPC, a combination of black and white lines and numbers, based on Woodland and Silver's idea but developed by George Laurer at IBM. Alan Haberman, who headed the subcommittee as president of First National Stores, described the bar code as a kind of world language that worked for everyone. He recalls proudly, 'We showed that it could be done on a massive scale, that cooperation… was possible for the common good, and that business didn't need the government to shove them in the right direction.'

The investment involved in the bar-code revolution was huge. Each of the tens of thousands of grocery outlets in the US had to spend at least $200,000 on new scanning equipment. Chains had to install new data processing centers and retrain their employees. Printers had to develop the new types of ink, plates, and other technology to reproduce the code with the exact tolerances it requires, and manufacturers had to spend millions of dollars a year on the labels.

On June 26, 1974, all the tests were done, all the proposals were complete, all the standards were set, and at a supermarket in Ohio, a single pack of Juicy Fruit chewing gum became the first retail product sold with the help of a bar code scanner. Decades of schemes and billions of dollars in investment now became a practical reality. The bar code on any product could be read and understood in every suitably equipped store.

The advantages of the system were not clear immediately, as wholesalers, retailers and customers remained suspicious. Some customers believed bar codes were a form of surveillance. During the early weeks, Business Week magazine ran the headline 'The Supermarket Scanner That Failed'. However, the benefits eventually became apparent. 'It turns out there were massive savings in labor and other areas,' Haberman says. These included checking out items at twice the speed compared to using traditional equipment, which meant shorter lines. And it did not take supermarkets too long to see that, as well as vastly improving customer service, the bar code could hugely reduce the amount of time spent checking inventory.

Now, every day more than 5 billion bar codes are scanned in retail outlets throughout the world. Passengers' luggage is tagged with bar codes by airlines. Staff attach them to babies to ensure the right babies go home from hospitals with the right mothers. Runners in major marathons set off with bar codes on their vests, and librarians rely on them. Tiny bar codes have even been mounted on bees by researchers to track their movements.

As for that original pack of Juicy Fruit, it is now, unchewed and unopened, in the Smithsonian Institution National Museum of American History in Washington.

Questions 1–8

Complete the notes below.

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

Write your answers in boxes 1–8 on your answer sheet.

History of the bar code

1948–1952

Methods of recording information automatically were developed by Silver and Woodland.

1st system:

- used ultraviolet light and a special type of **1** _____
- problems: expensive and not permanent

2nd system:

- based on technology used in Morse code and also for the **2** _____ of films
- problems: **3** _____ and expensive

1970s

- Availability of cheaper **4** _____ meant scanning technology spread more widely
- Problem: lack of **5** _____ in code systems
- April 1973: committee agreed on one universal product code (UPC)
- June 1974: pack of Juicy Fruit chewing gum sold with bar code scanner
- Advantages of bar code system:
  - supermarkets needed to spend less on labour
  - the **6** _____ of checkouts increased
  - doing inventories was much cheaper

Present day

Users of bar codes include:

- retail companies
- airlines
- staff in hospitals
- participants in **7** _____
- scientists studying **8** _____

Questions 9–13

Do the following statements agree with the information given in Reading Passage 1?

In boxes 9–13 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*

9 Bernard Silver was invited to develop a system for capturing product information by the president of a food chain.

10 A committee set up in the 1970s said bar codes should be easy to use and not too expensive.

11 Alan Haberman disagreed with government policies on business matters.

12 Many grocery outlets were unable to afford the necessary scanning equipment.

13 The advantages of the new bar code scanner took some time to be accepted by users.

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1–8 Notes Completion

题号	答案	题干翻译	精确定位句（原文）	定位句翻译	详细解释
1	**ink**	使用紫外线和一种特殊类型的 _____	“Their first idea was to use patterns **printed with an ink** that would glow under ultraviolet light …”	他们最初的想法是使用能在紫外线下发光的**墨水**印刷图案……	题干给出 “ultraviolet light and a special type of ___”。原文把 “ink” 与紫外线直接并列，完美对应。
2	**soundtracks**	基于莫尔斯电码和用于电影 _____ 的技术	“…using elements from two established technologies: Morse code … **and the method used to record soundtracks in movies**.”	……使用了两种既有技术的要素：莫尔斯电码……以及**用于记录电影原声（音轨）**的方法。	题干 “of films” 提示名词复数；原文 “soundtracks in movies”。同义替换 films = movies。
3	**unreliable**	问题：_____ 且昂贵	“But the cost, together with the fact that their scanning equipment was rather **unreliable**, made the idea a non-starter …”	但其成本再加上扫描设备相当**不可靠**这一事实，使这个想法当时行不通。	题干给出 “and expensive”，与原文 “cost” 对应；另一个问题即 “unreliable”。
4	**lasers**	更便宜的 _____ 的出现使扫描技术更广泛传播	“Scanning systems made little progress until the 1970s, when **lasers** became affordable.”	扫描系统直到 20 世纪 70 年代才取得进展，那时**激光**变得负担得起。	“became affordable”=更便宜可用。激光变便宜→技术普及。
5	**standardization**	问题：编码系统缺乏 _____	“…each with its own proprietary code, **but there was no standardization**.”	……每套系统都有自己的专用编码，**但没有标准化**。	直接同词复现；缺 “标准化” 导致问题。
6	**speed**	收银台的 _____ 提高了	“These included **checking out items at twice the speed** compared to using traditional equipment …”	这包括以**两倍速度**结账……	题干的 “the ___ of checkouts increased”=结账的**速度**提升；原文 “twice the speed”。
7	**marathons**	（如今的使用者还包括）参加 _____ 的人	“**Runners in major marathons** set off with bar codes on their vests …”	**大型马拉松的参赛者**穿着带有条码的背心起跑……	participants = runners；events 指的即 “marathons”。
8	**bees**	研究 _____ 的科学家	“Tiny bar codes have even been mounted on **bees** by researchers to track their movements.”	研究人员甚至把微型条码装到**蜜蜂**身上以追踪其运动。	scientists studying = researchers; 对象为 **bees**。

9–13 T/F/NG

题号	答案	题干翻译	精确定位句（原文）	定位句翻译	详细解释
9	**FALSE**	食品连锁的总裁邀请伯纳德·西尔弗来开发信息捕捉系统。	“The president of a food chain was pleading with **a professor** to undertake research … The professor turned down the request, but Bernard Silver **mentioned the conversation** to his friend …”	一家食品连锁的总裁在恳求**一位教授**开展研究……教授拒绝了，但西尔弗把这次谈话转述给了朋友……	被邀请/请求的人是 “**a professor**”，而非 Silver。题干把对象说成 Silver，与原文矛盾，故 **F**。
10	**TRUE**	70 年代成立的委员会认为条码应易用且成本不高。	“At the heart of the committee’s guidelines… bar codes would have to be readable from almost any angle … the labels would have to be **cheap** and easy to print. And … checkout systems would have to **pay for themselves** …”	委员会的要点：条码必须几乎从任何角度都能读；标签要**便宜**且易印；系统要在两年半内**回本**。	“易用” 体现在 “可从几乎任何角度、不同距离读取”；“不贵” 体现在 “labels cheap / 系统能回本”。与题干一致，**T**。
11	**NOT GIVEN**	阿兰·哈伯曼不同意政府在商业问题上的政策。	“We showed … that business **didn’t need the government** to shove them in the right direction.”	我们证明了企业**不需要政府**来把他们推向正确方向。	原文仅表明 “无需政府推动”，未谈 “**不同意政府政策**” 这一立场或具体政策内容。题干引入 “政策” 评价，文本无信息，**NG**。
12	**NOT GIVEN**	许多杂货店负担不起所需的扫描设备。	“Each of the tens of thousands of grocery outlets … **had to spend at least $200,000** on new scanning equipment.”	美国成千上万家杂货店**不得不花**至少 20 万美元购买新扫描设备。	文本说明 “花了很多钱”，但没有说 “**很多商店负担不起**” 或因此没有购买。缺乏（无力承担）信息，**NG**。
13	**TRUE**	新型条码扫描器的优点被用户接受花了一段时间。	“The advantages of the system were **not clear immediately**, as wholesalers, retailers and customers remained **suspicious** … However, the benefits eventually became apparent.”	该系统的优点**并未立刻显现**，批发商、零售商和顾客最初都**持怀疑态度**……不过好处最终变得明显。	“not clear immediately / remained suspicious”=起初不被接受；后来才认可，符合 “花了一段时间”，**T**。