- 剑六Test 1 READING PASSAGE 1

AUSTRALIA'S SPORTING SUCCESS

- A They play hard, they play often, and they play to win. Australian sports teams win more than their fair share of titles, demolishing rivals with seeming ease. How do they do it? A big part of the secret is an extensive and expensive network of sporting academies underpinned by science and medicine. At the Australian Institute of Sport (AIS), hundreds of youngsters and pros live and train under the eyes of coaches. Another body, the Australian Sports Commission (ASC), finances programmes of excellence in a total of 96 sports for thousands of sportsmen and women. Both provide intensive coaching, training facilities and nutritional advice.

- B Inside the academies, science takes centre stage. The AIS employs more than 100 sports scientists and doctors, and collaborates with scores of others in universities and research centres. AIS scientists work across a number of sports, applying skills learned in one – such as building muscle strength in golfers – to others, such as swimming and squash. They are backed up by technicians who design instruments to collect data from athletes. They all focus on one aim: winning. ‘We can't waste our time looking at ethereal scientific questions that don't help the coach work with an athlete and improve performance,' says Peter Fricker, chief of **science at** AIS

- C A lot of their work comes down to measurement – everything from the exact angle of a swimmer's dive to the second-by-second power output of a cyclist. This data is used to wring improvements out of athletes. The focus is on individuals, tweaking performances to squeeze an extra hundredth of a second here, an extra millimetre there. No gain is too slight to bother with. It's the tiny, gradual improvements that add up to world-beating results. To demonstrate how the system works, Bruce Mason at AIS shows off the prototype of a 3D analysis tool for studying swimmers. A wire-frame model of a champion swimmer slices through the water, her arms moving in slow motion. Looking side-on, Mason measures the distance between strokes. From above, he analyses how her spine swivels. When fully developed, this system will enable him to build a biomechanical profile for coaches to use to help budding swimmers. Mason's contribution to sport also includes the development of the SWAN (Swimming Analysis) system now used in Australian national competitions. It collects images from digital cameras running at 50 frames a second and breaks down each part of a swimmer's performance into factors that can be analysed individually – stroke length, stroke frequency, average duration of each stroke, velocity, start, lap and finish times, and so on. At the end of each race, SWAN spits out data on each swimmer.

- D 'Take a look,' says Mason, pulling out a sheet of data. He points out the data on the swimmers in second and third place, which shows that the one who finished third actually swam faster. So why did he finish 35 hundredths of a second down? 'His turn times were 44 hundredths of a second behind the other guy,' says MasonIf he can improve on his turns, he can do much better: This is the kind of accuracy that AIS scientists' research is bringing to a range of sports. With the Cooperative Research Centre for Micro Technology in Melbourne, they are developing unobtrusive sensors that will be embedded in an athlete's clothes or running shoes to monitor heart rate, sweating, heat production or any other factor that might have an impact on an athlete's ability to run. There's more to it than simply measuring performance. Fricker gives the example of athletes who may be down with coughs and colds 11 or 12 times a year. After years of experimentation, AIS and the University of Newcastle in New South Wales developed a test that measures how much of the immune-system protein immunoglobulin A is present in athletes' saliva. If IgA levels suddenly fall below a certain level, training is eased or dropped altogether. Soon, IgA levels start rising again, and the danger passes. Since the tests were introduced, AIS athletes in all sports have been remarkably successful at staying healthy.

- E Using data is a complex business. Well before a championship, sports scientists and coaches start to prepare the athlete by developing a 'competition model', based on what they expect will be the winning times. 'You design the model to make that time,' says Mason. 'A start of this much, each free-swimming period has to be this fast, with a certain stroke frequency and stroke length, with turns done in these times: All the training is then geared towards making the athlete hit those targets, both overall and for each segment of the race. Techniques like these have transformed Australia into arguably the world's most successful sporting nation.

- F Of course, there's nothing to stop other countries copying – and many have tried. Some years ago, the AIS unveiled coolant-lined jackets for endurance athletes. At the Atlanta Olympic Games in 1996, these sliced as much as two per cent off cyclists' and rowers' times. Now everyone uses them. The same has happened to the 'altitude tent', developed by AIS to replicate the effect of altitude training at sea level. But Australia's success story is about more than easily copied technological fixes, and up to now no nation has replicated its all-encompassing system.

- ***Questions 1-7***
- Reading Passage 1 has six paragraphs, A—F.
- Which paragraph contains the following information?
- *Write the correct letter* ***A—F, in boxes*** *1-7 on your answer sheet.*
- *NB* → *You may use any letter more than once.*

- 1 a reference to the exchange of expertise between different sports
- 2 an explanation of how visual imaging is employed in investigations
- 3 a reason for narrowing the scope of research activity
- 4 how some AIS ideas have been reproduced
- 5 how obstacles to optimum achievement can be investigated
- 6 an overview of the funded support of athletes
- 7 how performance requirements are calculated before an event

- *Questions 8-11*
- *Classify the following techniques according to whether the writer states they*
- **A** *are currently exclusively used by Australians*
- **B** *will be used in the future by Australians*
- **C** *are currently used by both Australians and their rivals*
- *Write the correct law A, B or C, in boxes 8-11 on your answer sheet.*

- 8 cameras
- 9 sensors
- 10 protein tests
- 11 altitude tents

- ***Questions 12 and 13***
- *Answer the questions below.*
- *Choose* ***NO MORE THAN THREE WORDS AND/OR A NUMBER*** from *the passage for each answer.*

- ***Write your answers in boxes 12 and 13 on your answer sheet.***
- **12 What is produced to help an athlete plan their performance in an event?**
- **13 By how much did some cyclists' performance improve at the 1996 Olympic Games?**

- **Flow chart流程图**
- **1.**一般出现在科普类的文章，定位容易
- **2.**填空所在的那一步如果没有名词可定位的时候，可用上一步或下一步中的名词定位
- **3.**题型内部答案按顺序给出

- **剑五Test 2 READING PASSAGE 1**

BAKELITE

The birth of modern plastics

- In 1907, Leo Hendrick Baekeland, a Belgian scientist working in New York, discovered and patented a revolutionary new synthetic material. His invention, which he named 'Bakelite', was of enormous technological importance, and effectively launched the modern plastics industry.

- The term 'plastic' comes from the Greek*plassein.* meaning 'to mould'. Some plastics are derived from natural sources, some are semi-synthetic (the result of chemical action on a natural substance), and some are entirely synthetic, that is, chemically engineered from the constituents of coal or oil. Some are 'thermoplastic', which means that, like candlewax, they melt when heated and can then be reshaped. Others *are* 'thermosetting': like eggs, they cannot revert to their original viscous state, and their shape is thus fixed for ever Bakelite had the distinction of being the first totally synthetic thermosetting plastic.

- The history of today's plastics begins with the discovery of a series of semi-synthetic thermoplastic materials in the mid-nineteenth century. The impetus behind the development of these early plastics was generated by a number of factors - immense technological progress in the domain of chemistry, coupled with wider cultural changes, and the pragmatic need to find acceptable substitutes for dwindling supplies of 'luxury' materials such as tortoiseshell and ivory.

- Baekeland's interest in plastics began in 1885 when, as a young chemistry student in Belgium, he embarked on research into phenolic resins, the group of sticky substances produced when phenol (carbolic acid) combines with an aldehyde (a volatile fluid similar to alcohol). He soon abandoned the subject, however, only returning to it some years later. 8y 1905 he was a wealthy New Yorker, having recently made his fortune with the invention of a new photographic paper. While Baekeland had been busily amassing dollars, some advances had been made in the development of plastics. The years 1899 and 1900 had seen the patenting of the first semi-synthetic thermosetting material that could be manufactured *on* an industrial scale. In purely scientific terms, Baekeland's major contribution to the field is not so much the actual discovery of the material to which he gave his name, but rather the method by which a reaction between phenol and formaldehyde could be controlled, thus making possible its preparation on a commercial basis. On 13 July 1907, Baekeland took out his famous patent describing this preparation, the essential features of which *are* still in use today.

- The original patent outlined a three-stage process, in which phenol and formaldehyde (from wood or coal) were initially combined under vacuum inside a large egg-shaped kettle. The result was a resin known as Novalak, which became soluble and malleable when heated. The resin was allowed to cool in shallow trays until it hardened, and then broken up and ground into powder. Other substances were then introduced: including fillers, such as woodflour, asbestos or cotton, which increase strength and moisture resistance, catalysts (substances to speed up the reaction between two chemicals without joining to either) and hexa, a compound of ammonia and formaldehyde which supplied the additional formaldehyde necessary to form a thermosetting resin. This resin was then left to cool and harden, and ground up a second time. The resulting granular powder was raw Bakelite, ready to be made into a vast range of manufactured objects. In the last stage, the heated Bakelite was poured into a hollow mould of the required shape and subjected to extreme heat and pressure, thereby 'setting' its form for life.

- The design of Bakelite objects, everything from earrings to television sets, was governed to a large extent by the technical requirements of the molding process. The object could not be designed so that it was locked into the mould and therefore difficult to extract. A common general rule was that objects should taper towards the deepest part of the mould, and if necessary the product was molded in separate pieces. Moulds had to be carefully designed so that the molten Bakelite would flow evenly and completely into the mould. Sharp corners proved impractical and were thus avoided, giving rise to the smooth, 'streamlined" style

- popular in the 1930s. The thickness of the walls of the mould was also crucial" thick walls took longer to cool and harden, a factor which had to be considered by the designer in order to make the most efficient use of machines.
- Baekeland's invention, although treated with disdain in its early years, went on to enjoy an unparalleled popularity which lasted throughout the first half of the twentieth century. It became the wonder product of the new world of industrial expansion - 'the material of a thousand uses'. Being both non-porous and heat-resistant, Bakelite kitchen goods were promoted as being

- germ-free and sterilisable. Electrical manufacturers seized on its insulating properties, and consumers everywhere relished its dazzling array of shades, delighted that they were now, at last, no longer restricted to the wood tones and drab browns of the pre-plastic era. It then fell from favour again during the 1950s, and was despised and destroyed in vast quantities. Recently, however, it has been experiencing something of a renaissance, with renewed demand for original Bakelite objects in the collectors' marketplace, and museums, societies and dedicated individuals once again appreciating the style and originality of this innovative material.

- ***Questions 1-3***
- *Complete the summary.*
- *Choose ONE WORD ONLY from the passage for each answer. Write your answers in boxes 1-3 on your answer sheet.*

- Some plastics behave in a similar way to 1 .... in that they melt under heat and can be moulded into new forms. Bakelite was unique because it was the first material to be both entirely 2 ....in origin, and thermosetting.
- There were several reasons for the research into plastics in the nineteenth century, among them the great advances that had been made in the field of 3.................................. and the search for alternatives to natural resources like ivory.

- *Questions 4-8*
- *Complete the flow-chart.*
- *Choose ONE WORD ONLY from the passage for each answer. Write your answers in boxes 4-8 on your answer sheet.*

◎ The Production of Bakelite

Phenol

formaldehyde

combine under vacuum

↓

stage one resin， called 4………..

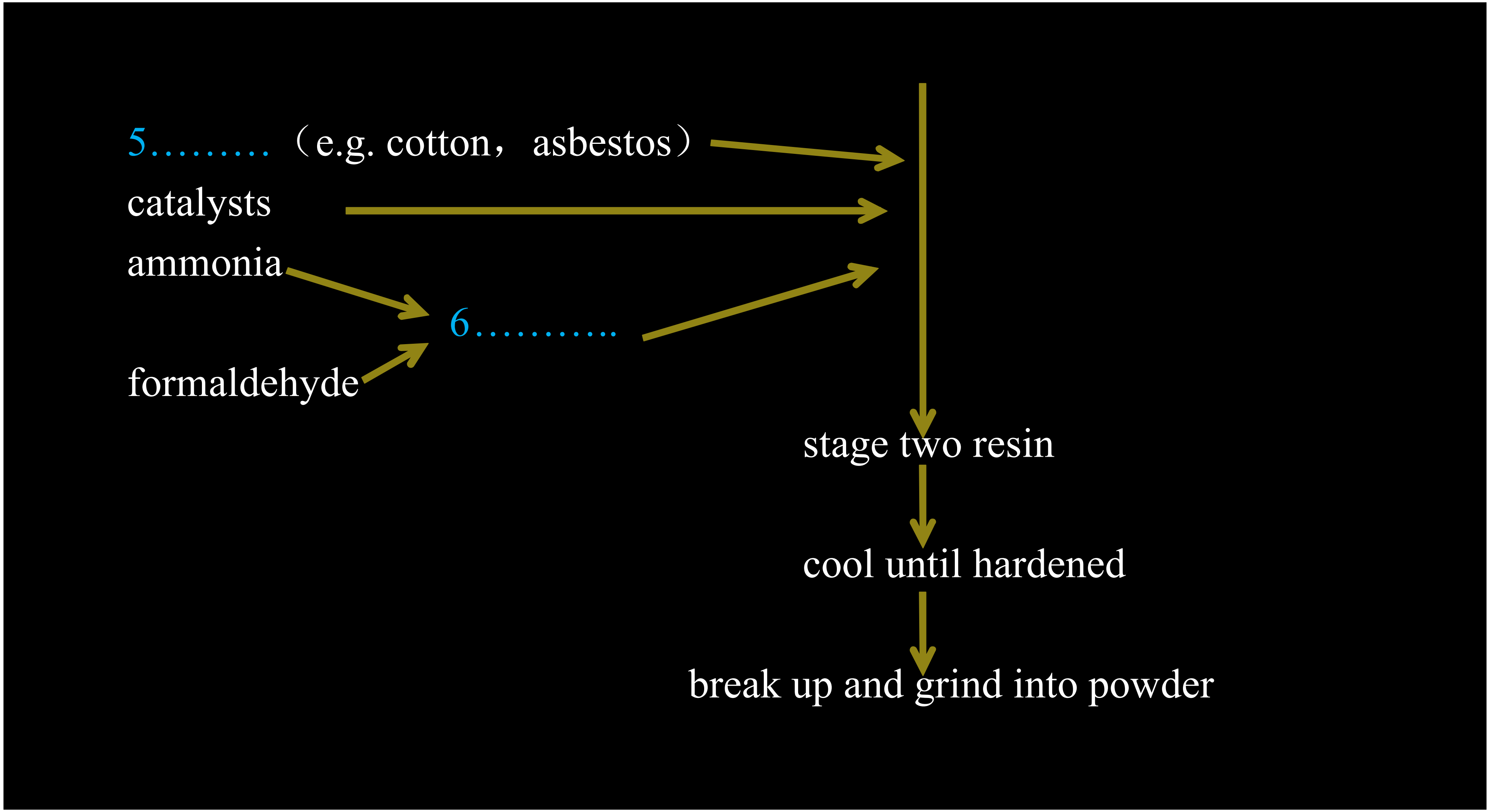
↓

cool until hardened

↓

beak up and grind into powder

↓


5……… （e.g. cotton， asbestos）
catalysts
ammonia
6……….
formaldehyde
stage two resin
cool until hardened
break up and grind into powder

7.................. Bakelite

heat

pour into mould

apply intense heat and 8...........

cool until hardened

- ***Questions 9 and 10***
- *Choose* ***TWO*** *letters A-E.*
- *Write your answers in boxes 9 and 10 on your answer sheet.*
- *NB ⟶ Your answers may be given in either order.*
- Which TWO of the following factors influencing the design of Bakelite objects are mentioned in the text?

- A the function which the object would serve
- B the ease with which the resin could fill the mould
- C the facility with which the object could be removed from the mould
- D the limitations of the materials used to manufacture the mould
- E the fashionable styles of the period

- ***Questions 11—13***
- Do the following statements agree with the information given in Reading Passage 1?
- *In boxes 11-13 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*

- 11 Modern-day plastic preparation is based on the same principles as that patented in 1907.
- 12 Bakelite was immediately welcomed as a practical and versatile material.
- 13 Bakelite was only available in a limited range of colours.

- 阅读复习
- 1. 词汇
- 2. 练习阅读速度和语感
- 3. 做题

谢 谢

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