

## Đề thi thật 1: The Development of Plastics

### Paragraph 1

When rubber was first commercially produced in Europe during the nineteenth century, it rapidly became a very important commodity, particularly in the fields of transportation and electricity. However, during the twentieth century a number of new synthetic materials, called plastics, superseded natural rubber in all but a few applications.

### Paragraph 2

Rubber is a polymer—a compound containing large molecules that are formed by the bonding of many smaller, simpler units, repeated over and over again. The same bonding principle—polymerization—underlies the creation of a huge range of plastics by the chemical industry.

### Paragraph 3

The first plastic was developed as a result of a competition in the USA. In the 1860s, \$10,000 was offered to anybody who could replace ivory—supplies of which were declining—with something equally good as a material for making billiard balls. The prize was won by John Wesley Hyatt with a material called celluloid. Celluloid was made by dissolving cellulose, a carbohydrate derived from plants, in a solution of camphor dissolved in ethanol. This new material rapidly found uses in the manufacture of products such as knife handles, detachable collars and cuffs, spectacle frames and photographic film. Without celluloid, the film industry could never have got off the ground at the end of the 19th century

### Paragraph 4

Celluloid can be repeatedly softened and reshaped by heat, and is known as a thermoplastic. In 1907, Leo Baekeland, a Belgian chemist working in the USA, invented a different kind of plastic, by causing phenol and formaldehyde to react together. Baekeland called the material Bakelite, and it was the first of the thermosets—plastics that can be cast and moulded while hot, but cannot be softened by heat and reshaped once they have set. Bakelite was a good insulator, and was resistant to water, acids and moderate heat. With these properties it was soon being used in the manufacture of switches, household items such as knife handles, and electrical components for cars.

### Paragraph 5

Soon chemists began looking for other small molecules that could be strung together to make polymers. In the 1930s British chemists discovered that the gas ethylene would polymerize under heat and pressure to form a thermoplastic they called polythene. Polypropylene followed in the 1950s. Both were used to make bottles, pipes and plastic bags. A small change in the starting material—replacing a hydrogen atom in ethylene with a chlorine atom—produced PVC (polyvinyl chloride), a hard, fireproof plastic suitable for drains and gutters. And by adding certain chemicals, a soft form of PVC could be produced, suitable as a substitute for rubber in items such as waterproof clothing. A closely related plastic was Teflon, or PTFE (polytetrafluoroethylene). This had a very low coefficient of friction, making it ideal for bearings, rollers, and non-stick frying pans. Polystyrene, developed during the 1930s in Germany, was a clear, glass-like material, used in food containers, domestic appliances and toys. Expanded polystyrene—a white, rigid foam—was widely used in packaging and insulation. Polyurethanes, also developed in Germany, found uses as adhesives, coatings, and—in the form of rigid foams—as insulation materials. They are all produced from chemicals derived from crude oil, which contains exactly the same elements—carbon and hydrogen—as many plastics.

### Questions

#### 1–6

Complete the sentences below.

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

1. Rubber became widely used in transport and -----.
2. The bonding process of many plastics is also called -----.
3. The first plastic, celluloid, was invented to replace -----.
4. Photographic film was one of the early applications of -----.
5. Bakelite cannot be reshaped once it has -----.
6. The clear form of polystyrene resembles -----.

#### 7–10

Look at the following materials (Questions 7–10) and the list of characteristics below.

Match each material with the correct characteristic, A–E.

### Materials

7. PVC (soft form)

8. Teflon

9. Nylon

10. Polystyrene foam

### Characteristics

A. Used as an insulating foam

B. Ideal for slippery surfaces

C. Originally used in parachutes

D. Can substitute rubber in clothing

E. First synthetic plastic

## Paragraph 6

The first of the man-made fibres, nylon, was also created in the 1930s. Its inventor was a chemist called Wallace Carothers, who worked for the Du Pont company in the USA. He found that under the right conditions, two chemicals—hexamethylenediamine and adipic acid—would form a polymer that could be pumped out through holes and then stretched to form long glossy threads that could be woven like silk. Its first use was to make parachutes for the US armed forces in World War II. In the post-war years, nylon completely replaced silk in the manufacture of stockings. Subsequently many other synthetic fibres joined nylon, including Orion, Acrilan and Terylene. Today most garments are made of a blend of natural fibres, such as cotton and wool, and man-made fibres that make fabrics easier to look after.

11–13

Choose the correct letter, A, B, C or D.

11. Which of the following was NOT an original use of celluloid?

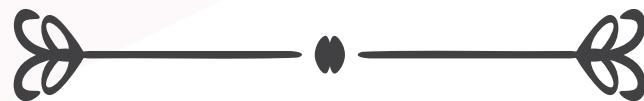
- A. Film
- B. Clothing
- C. Knife handles
- D. Spectacle frames

12. What property made Bakelite suitable for electrical uses?

- A. Flexibility
- B. Transparency
- C. Heat resistance
- D. Colour variety

13. What made nylon a good replacement for silk in stockings?

- A. Lower cost
- B. Easier production
- C. War-time demand
- D. Similar thread quality



## Đề thi thật 2: Seaweeds of New Zealand

A. Seaweed is a particularly wholesome food, which absorbs and concentrates traces of a wide variety of minerals necessary to the body's health. Many elements may occur in seaweed – aluminium, barium, calcium, chlorine, copper, iodine and iron, to name but a few – traces normally produced by erosion and carried to the seaweed beds by river and sea currents. Seaweeds are also rich in vitamins; indeed, Inuits obtain a high proportion of their bodily requirements of vitamin C from the seaweeds they eat. The health benefits of seaweed have long been recognised. For instance, there is a remarkably low incidence of goitre among the Japanese, and also among New Zealand's indigenous Maori people, who have always eaten seaweeds, and this may well be attributed to the high iodine content of this food. Research into historical Maori eating customs shows that jellies were made using seaweeds, nuts, fuchsia and tutu berries, cape gooseberries, and many other fruits both native to New Zealand and sown there from seeds brought by settlers and explorers. As with any plant life, some seaweeds are more palatable than others, but in a survival situation, most seaweeds could be chewed to provide a certain sustenance.

B. New Zealand lays claim to approximately 700 species of seaweed, some of which have no representation outside that country. Of several species grown worldwide, New Zealand also has a particularly large share. For example, it is estimated that New Zealand has some 30 species of *Gigartina*, a close relative of carrageen or Irish moss. These are often referred to as the New Zealand carrageens. The substance called agar which can be extracted from these species gives them great commercial application in the production of seameal, from which seameal custard (a food product) is made, and in the canning, paint and leather industries. Agar is also used in the manufacture of cough mixtures, cosmetics, confectionery and toothpastes. In fact, during World War II, New Zealand *Gigartina* were sent to Australia to be used in toothpaste.

### Questions 1 – 6

Reading Passage 1 has six paragraphs, A-F. Choose the correct heading for each paragraph from the list of headings below.

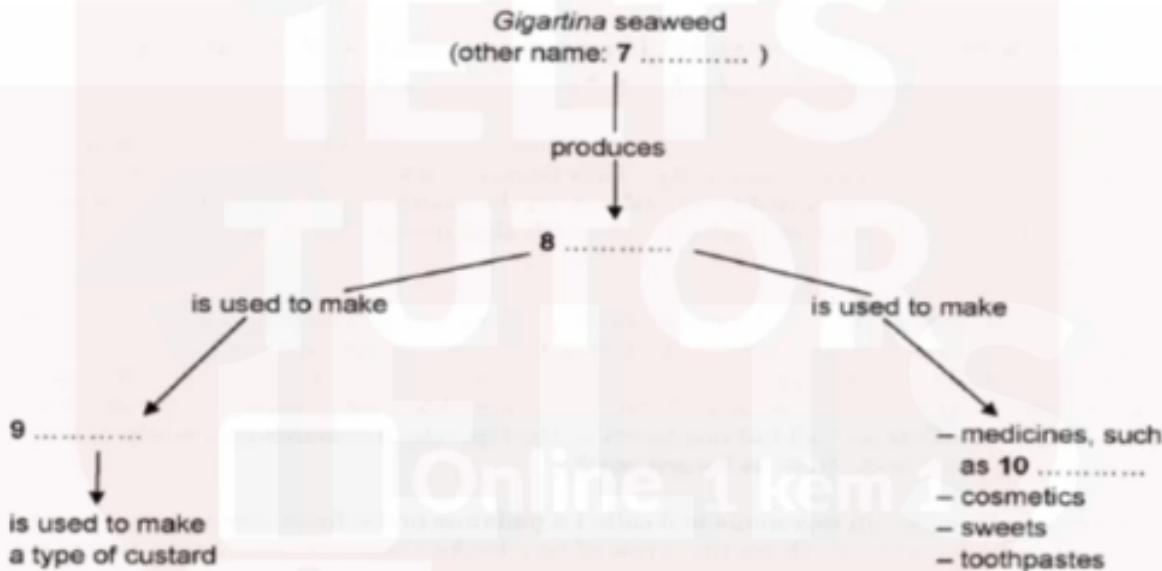
#### List of Headings

- i The appearance and location of different seaweeds
- ii The nutritional value of seaweeds
- iii How seaweeds reproduce and grow
- iv How to make agar from seaweeds
- v The under-use of native seaweeds
- vi Seaweed species at risk of extinction
- vii Recipes for how to cook seaweeds
- viii The range of seaweed products
- ix Why seaweeds don't sink or dry out

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

## Questions 7-10

Complete the flow-chart below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer.



C. New Zealand has many of the commercially profitable red seaweeds, several species of which are a source of agar (Pterocladia, Gelidium, Chondrus, Gigartina). Despite this, these seaweeds were not much utilised until several decades ago. Although distribution of the Gigartina is confined to certain areas according to species, it is only on the east coast of the North Island that its occurrence is rare. And even then, the east coast, and the area around Hokianga, have a considerable supply of the two species of Pterocladia from which agar is also made. New Zealand used to import the Northern Hemisphere Irish moss (Chondrus crispus) from England and ready-made agar from Japan.

D. Seaweeds are divided into three classes determined by colour – red, brown and green – and each tends to live in a specific position. However, except for the unmistakable sea lettuce (*Ulva*), few are totally one colour; and especially when dry, some species can change colour significantly – a brown one may turn quite black, or a red one appear black, brown, pink or purple. Identification is nevertheless facilitated by the fact that the factors which determine where a seaweed will grow are quite precise, and they tend therefore to occur in very well-defined zones. Although there are exceptions, the green seaweeds are mainly shallow-water algae; the browns belong to the medium depths; and the reds are plants of the deeper water, furthest from the shore. Those shallow-water species able to resist long periods of exposure to sun and air are usually found on the upper shore, while those less able to withstand such exposure occur nearer to, or below, the low-water mark. Radiation from the sun, the temperature level, and the length of time immersed also play a part in the zoning of seaweeds. Flat rock surfaces near midlevel tides are the most usual habitat of sea-bombs, Venus' necklace, and most brown seaweeds. This is also the home of the purple laver or Maori karengo, which looks rather like a reddish-purple lettuce. Deep-water rocks on open coasts, exposed only at very low tide, are usually the site of bull-kelp, strapweeds and similar tough specimens. Kelp, or bladder kelp, has stems that rise to the surface from massive bases or 'holdfasts', the leafy branches and long ribbons of leaves surging with the swells beyond the line of shallow coastal breakers or covering vast areas of calmer coastal water.

E. Propagation of seaweeds occurs by seed-like spores, or by fertilisation of egg cells. None have roots in the usual sense; few have leaves; and none have flowers, fruits or seeds. The plants absorb their nourishment through their leafy fronds when they are surrounded by water; the holdfast of seaweeds is purely an attaching organ, not an absorbing one.

F. Some of the large seaweeds stay on the surface of the water by means of air-filled floats; others, such as bull-kelp, have large cells filled with air. Some which spend a good part of their time exposed to the air, often reduce dehydration either by having swollen stems that contain water, or they may (like Venus' necklace) have swollen nodules, or they may have a distinctive shape like a sea-bomb. Others, like the sea cactus, are filled with a slimy fluid or have a coating of mucilage on the surface. In some of the larger kelps, this coating is not only to keep the plant moist, but also to protect it from the violent action of waves.

## Questions 11-13

Classify the following characteristics as belonging to

- A. brown seaweed
- B. green seaweed
- C. red seaweed

Write the correct letter, A, B or C, in boxes 11-13 on your answer sheet.

- 11. can survive the heat and dryness at the high-water mark
- 12. grow far out in the open sea
- 13. share their site with karengo seaweed

## Đề thi thật 3: Fishbourne Roman Palace

Fishbourne Roman Palace is in the village of Fishbourne in West Sussex, England. This large palace was built in the 1st century AD, around thirty years after the Roman conquest of Britain, on the site of Roman army grain stores which had been established after the invasion, during the reign of the Roman Emperor Claudius in 43 AD. The rectangular palace was built around formal gardens, the northern half of which has been reconstructed. There were extensive alterations in the 2nd and 3rd centuries AD, with many of the original black and white mosaic floors being overlaid with more sophisticated colored ones, including a perfectly preserved mosaic of a dolphin in the north wing. More alterations were in progress when the palace burned down around 270 AD, after which it was abandoned.

Local people had long believed that a Roman palace once existed in the area. However, it was not until 1960 that the archaeologist Barry Cunliffe, of Oxford University, first systematically excavated the site, after workmen accidentally uncovered a wall while laying a water main. The Roman villa excavated by Cunliffe's team was so grand that it became known as Fishbourne Roman Palace, and a museum was erected to preserve some of the remains. This is administered by the Sussex Archaeological Society.

In its day, the completed palace would have comprised four large wings with colonnaded fronts. The north and east wings consisted of suites of private rooms built around courtyards, with a monumental entrance in the middle of the east wing. In the north-east corner, there was an assembly hall. The west wing contained state rooms, a large ceremonial reception room, and a gallery. The south wing contained the owner's private apartments. The palace included as many as 50 mosaic floors, under-floor central heating, and a bathhouse. In size, Fishbourne Palace would have been approximately equivalent to some of the great Roman palaces of Italy and was by far the largest known Roman residence north of the European Alps, measuring about 500 feet (150 m) square. A team of volunteers and professional archaeologists are involved in ongoing archaeological excavation on the site of nearby, possibly military, buildings.

### Questions 1–6

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

*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*

1. *Fishbourne Palace was the first structure to be built on its site.*
2. *Fishbourne Palace was renovated more than once.*
3. *Fishbourne Palace was large in comparison with Roman palaces in Italy.*
4. *Research is continuing in the area close to Fishbourne Palace.*
5. *Researchers agree on the identity of the person for whom Fishbourne Palace was constructed.*
6. *Fishbourne Palace was burnt down by local people.*

## Đề thi thật 3: Fishbourne Roman Palace

The first buildings to be erected on the site were constructed in the early part of the conquest in 43 AD. Later, two timber buildings were constructed, one with clay and mortar floors and plaster walls, which appears to have been a house of some comfort. These buildings were demolished in the 60s AD and replaced by a substantial stone house, which included colonnades and a bath suite. It has been suggested that the palace itself, incorporating the previous house in its south-east corner, was constructed around 73–75 AD. However, Dr. Miles Russell, of Bournemouth University, reinterpreted the ground plan and the collection of objects found and suggested that, given the extremely close parallels with the imperial palace of Domitian in Rome, its construction may more plausibly date to after 92 AD. With regard to who lived in Fishbourne Palace, there are a number of theories. For example, one proposed by Professor Cunliffe is that, in its early phase, the palace was the residence of Tiberius Claudius Cogidubnus, a local chieftain who supported the Romans and may have been installed as king of a number of territories following the first stage of the conquest. Cogidubnus is known from a reference to his loyalty in *Agricola*, a work by the Roman writer Tacitus, and from an inscription commemorating a temple dedicated to the gods Neptune and Minerva found in the nearby city of Chichester. Another theory is that it was built for Sallustius Lucullus, a Roman governor of Britain in the late 1st century, who may have been the son of the British prince Adminius. Two inscriptions recording the presence of Lucullus have been found in Chichester, and the redating by Miles Russell suggests that if the palace was designed for Lucullus, it may have only been in use for a few years, as the Roman historian Suetonius records that Lucullus was executed by the Emperor Domitian in or shortly after 93 AD.

Additional theories suggest that either Verica, a British king of the Roman Empire in the years preceding the Claudian invasion, was the owner of the palace, or Tiberius Claudius Catuarus, following the recent discovery of a gold ring belonging to him. The palace outlasted the original owner, whoever he was, and was extensively re-planned early in the 2nd century AD and subdivided into a series of lesser apartments. Further redevelopment was begun in the late 3rd century AD, but these alterations were incomplete when the north wing was destroyed in a fire around 270 AD. The damage was too great to repair, and the palace was abandoned and later dismantled.

A modern museum has been built by the Sussex Archaeological Society, incorporating most of the visible remains, including one wing of the palace. The gardens have been re-planted using authentic plants from the Roman period.

### Questions 7–13

Complete the notes below.

Choose NO MORE THAN TWO WORDS AND/OR A NUMBER from the passage for each answer.

#### Fishbourne Palace

##### Construction

- The first buildings on the site contained food for the 7...
- The palace building surrounded 8...
- In the 2nd and 3rd centuries, color was added to the 9... of the palace.

##### Discovery

- The first part of the palace to be found was part of a 10...

##### Possible Inhabitants

- Congidubnus – he is named in several writings
- Sallustius Lucullus – he may have lived there until approximately 11... AD
- Verica – a British king
- Catuarus – his 12... was found there

##### Present Day

- A 13... has been built on the site to help protect it.