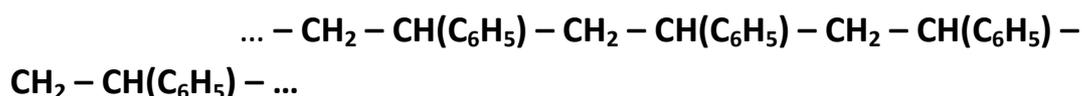


Correction of the Englis Exam

1/ The title of the text is **Plastics**

- **2/** Q1. **(i)** A polymer is a substance whose molecules consist of long chains of repeating units. **(ii)** An alkene is a member of a hydrocarbon series with the general formula C_nH_{2n} . **(iii)** An unsaturated organic compound is one whose molecules contain at least one double bond between carbon atoms. **(iv)** An initiator is a substance used to start a chemical reaction, particularly a polymerisation reaction. **(v)** A polymerisation reaction is a chemical reaction that results in the formation of a polymer. **(vi)** A thermoplastic is a plastic that softens on heating and can then be remoulded. **(vii)** Curing is the chemical process that occurs while a freshly made thermosetting plastic is hardening; chemical bonds are formed linking together the long chain molecules. **(viii)** Recycling means reusing an object or the material from which it is made (in order to avoid wasting resources). **(ix)** PVC stands for polyvinyl chloride.
- Q2. The structure of polystyrene can be represented by the structural formula below (C_6H_5 represents the phenyl radical which consists of a ring of 6 carbon atoms).



- Q3. Thermosets can not be remoulded because the long chain molecules are linked together by covalent bonds. (Chemical bonds are not easily broken by heating; if they are broken, then the substance is chemically changed into a different substance or substances).
- Q4. Advantages of plastics: low cost, tough, light in weight, easy to make, colour and mould, resist corrosion and chemicals. Disadvantages of plastics: present industry unsustainable as it relies on non-renewable crude oil, rising cost as demand for crude oil overtakes supply, permanently litters and pollutes the

environment and does not decay (even when buried in the ground!).

•
6/ Gaps filling **(i) Polyethylene** (polythene), **(ii) Polypropylene**, **(iii) polystyrene** , **(v) Fibreglass storage tanks**

7./ **Translation of the section**

8. (Grammar) **(i) perfective no one exist**

(i) progressive aspects 1/ **is increasing in** price 2/ Scientists **are trying** to find new

(ii) indicative mood 1/

(iii) passive voice 1/ tonnes of polythene **were produced by different factories** 2/ These resins **are made by mixing** two liquid parts

English Exam

Text

.....? are man-made *polymers*. They have long chain molecules that contain 1 000 to 100 000 carbon atoms. Plastics are useful because they are cheap, tough, light in weight and easy to make, colour and mould. They also resist corrosion and chemicals. Plastics are classified as *thermoplastics* or *thermosets*. Thermoplastics soften on heating and can be remoulded to a new shape, but thermosets do not soften. Most everyday plastic objects are made of thermoplastics.

.....? is the most widely used thermoplastic. It is made from ethylene (ethene, C₂H₄) which is the first member of the *alkene series* of hydrocarbons. The alkenes are *unsaturated* and each molecule contains one carbon-to-carbon double bond. An alkene has two hydrogen atoms less than the corresponding alkane and the general formula for the series is C_nH_{2n}. The double bond is sometimes shown by using a formula such as CH₂=CH₂.



Ethylene is made by *cracking* natural gas or the light fractions of refined crude oil. It is converted to polythene by heat and pressure. A special substance called an *initiator* has to be added to get the *polymerisation reaction* started. Depending on the conditions, the polythene may have upwards of 10 thousand carbon atoms in each long chain molecule.



More than 80 million tonnes of polythene were produced by different factories in 2008. Polythene is used mainly to make packaging and plastic bags. Special, high density polythene is used to make machine parts and plastic toys.

.....? and? are important plastics made from propylene (CH₃CH=CH₂) and styrene (C₆H₅CH=CH₂). Their long chain molecules are like those of polythene except that one in four hydrogen atoms are replaced by methyl (CH₃) radicals, or phenyl (C₆H₅) radicals (phenyl radicals consist of a ring of six carbon atoms). Polypropylene is used for packaging, and for making ropes, plastic chairs, small containers and plastic banknotes! Polystyrene is used in plastic mouldings such as CD/DVD cases, plastic razors and so on. It is also made into foam for packaging and insulation.



Other important thermoplastics include polyesters (used in fibres and fabrics), polyvinylchloride (PVC, used in water pipes), polycarbonate (used to make CDs and lenses in glasses), and nylon (used in fishing lines and fabrics).

.....?

Thermosets *cure* (harden or set) into their final shape at the time they are made; after that they can not be softened and remoulded by heat. The curing involves a reaction in which covalent bonds are formed between polymer chains so that the whole object becomes one huge molecule. The epoxy resins used in two-part glues and in fibreglass, are good examples of thermosets. These resins are made by mixing two liquid parts which react together. The mixture sets to a solid and cures over a period of a few minutes to a few days. In fibreglass, matted or woven fibres of glass or other materials are embedded in the plastic to increase its strength. Fibreglass has many uses, for example in the construction of boats, aircraft and storage tanks.

Sustainability and environmental issues. The present plastics industry is unsustainable because the raw materials come mostly from oil which is non-renewable and is increasing in price. Thermoplastics should be *recycled* and most products now carry recycling symbols like the one on the right (6 is for PVC). Scientists are trying to find new, renewable raw materials from plants. Plastics cause serious and permanent pollution. When we discard plastics they do not decay. Years later they still litter the environment and kill wildlife. Even in the middle of the ocean, we can find plastic bags and shoes floating alongside nylon fishing line, and broken polypropylene ropes and fishing nets.

Questions

1. **(1pts)** Give a title to this text?
2. **(04pts)** Explain the meaning of: **(i)** polymer, **(ii)** alkene, **(iii)** unsaturated, **(iv)** initiator, **(v)** polymerisation reaction, **(vi)** thermoplastic, **(vii)** curing, **(viii)** recycling, **(ix)** PVC.
- 3. **(02pts)** What is the structure of polystyrene ?
- 4. **(02pts)** Explain why we can't remould thermosetting plastics.
- 5. **(2.5pts)** List the advantages and disadvantages of plastics.
- 6. **(02pts)** Fill the gaps with the appropriate words.
- 7. **(03pts)** Translate the next section (The present plastics industry.... and fishing nets).
- 8. **(03.5pts)** (**Grammar**): **a)** Extract from the text if they exist : **(i)** perfective or progressive aspects, **(ii)** passive voice.
b) Write the affirmative, negative and negative form of the following sentence using Simple Past tense : **Teacher / explain/ the lesson**

GOOD LUCK

