REPUBLIQUE TUNISIENNE
Ministère de l'Enseignement Supérieur
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Concours Nationaux d'Entrée aux Cycles
de Formation d'Ingénieurs
Session 2010

وزارة التعليم العالي
والبحث العلمي

المناظرات الوطنية للدخول
إلى مراحل تكوين المهندسين
دورة 2010

# Concours Toutes Options
# Epreuve d'Anglais

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| **Date : Lundi 31 Mai 2010** | **Heure : 15 H** | **Durée : 2 H** | **Nbre pages : 08** |

**Barème : Part I :30, Part II: 30, Part III: 20**

IMPORTANT:

*1. L'épreuve d'anglais comporte deux séries de feuilles :*

- *Les énoncés s'étalant sur 4 pages que les candidats sont appelés à garder ;*
- *Les feuilles réservées aux réponses (Answer sheets) s'étalant sur 4 pages, lesquelles doivent être rendues à la fin de l'épreuve aux professeurs surveillants*

*2. Il sera tenu compte de la présentation, (l'écriture au crayon n'étant pas permise)*

1. **Liquid Wood better known by the trade name Arboform is the ecofriendly replacement to Plastic. With environmental issues such as pollution, increased CO2 levels causing global warming and depletion of oil reserves, scientists have chosen to look for eco-friendly alternatives. One such alternative is liquid wood. Arboform is the trade name coined for liquid wood.**
2. **For decades plastics have reigned the commodity and durable goods market because of their utility and durability. In the 20th Century the introduction of plastics found uncontested utility in every home, industry or machinery. However today, in an eco-friendly and environmentally conscious decade, a soupy expanse of plastic covering approximately 1 million square miles of the Pacific ocean is a cause of serious concern and raises alarm.**
3. **Plastics are neither recyclable nor are they renewable. Since plastics are derived from oil reserves, the future of plastics rests on the natural oil reserves of the world which are exponentially depleted as technology advances. Off late, pthalate softeners and heavy metals used in plastics are found to be toxins both, for the environment as well as for health. Norbert Eisenreich's group at the Fraunhofer Institute of Chemical Technology began researching a natural alternative to a material as utilitarian as plastic but more eco-friendly, since the 1900s.**
4. **Through their research and scientific pursuit they invented liquid wood. Liquid wood is a strong thermoplastic formulated from lignin, natural fibers and wax. It is non-toxic, bio-degradable and does not depend on a non-eternal resource such as petroleum. Prior to the introduction of liquid wood, bioplastics were experimented on but their manufacturing processes were found unsuited to domestic use as they had high sulfur content.**
5. **After Eisenreich's team developed liquid wood and christened with the trade name Arboform, it was further processed by Tecnaro a German company which molded and produced it in pellet form. A finished product of Arboform can take the looks of plastic or even an object of polished wood.**
6. **Arboform is not made from felling of trees but it is manufactured from the waste products of the paper industry. The paper industry separates out the three components of wood-lignin, cellulose and hemicellulose. Lignin is not used in the manufacture of paper as it gives paper a brownish hue. Often it is used in low quality newsprint but more often than not it is separated out with a sulfite or sulfate based pulping process**

prior to production of high quality paper. Lignin is the part of the wood in trees that lends support.

7. To formulate Arboform, scientists blended lignin with natural fibers like flax, hemp or jute and mixed it with wax. The mixture heated or conditioned under high pressures resulted in a thermoplastic material-liquid wood or Arboform.
8. To achieve low sulfur content and water proofing capabilities, the thermoplastic was subjected to high pressure hydrolysis. This eco-friendly alternative to plastic is produced from lignin which is abundant in renewable resource, non-toxic and biodegradable. It can be manufactured on a mass scale as well as molded into any shape or form. Experiments reveal that on heating or cooling it several times , it can still be remolded, reshaped and recycled. It can be disposed off in the same manner as wood-either through incineration or decomposition. Hundred million tonnes of global petroleum delivers insurmountable amounts of carbon dioxide into the atmosphere on combustion.
9. Therefore, incineration of plastics results in the formation of carbon dioxide ($CO_2$ ) cumulatively adds up to the total atmospheric $CO_2$ which results in global warming. It is estimated that the worldwide $CO_2$ emissions have reached seven times higher than the amount that the biosphere can fix in the form of organic compounds in any given period of time.
10. For Arboform when used as an alternative bioplastic, the carbon dioxide ($CO_2$) entering the atmosphere on incineration remains unchanged. It releases only that amount of carbon dioxide that the plant had originally fixed from the environment during its growth. Thus, the carbon cycle is closed and not disrupted. Liquid wood does not require any elaborate process to change its chemical composition before disposal. In fact it can even be discarded off like wood. Tecnaro molded 'Arboform' has been used in the manufacture of automobile parts, pens, speaker boxes, art forms and household goods.
11. As a product substitute of plastic, Arboform has better thermal and mechanical properties than both wood and plastic put together. Wood tends to split at right angles when subjected to strain but not Arboform. It is a biodegradable thermoplastic engineering material of superior quality and strength that will meet the technological demands replacing the indomitable market giant-plastic.
12. Concerned parents are already looking to replace plastic water bottles to protect their children from bis phenol A and phthalate toxins (chemicals used to harden plastics). In this flux of changing technology, the use of Arboform promises a more eco-friendly and a safer environment for tomorrow.

By Anjali Gharpure, *Buzzle.com*, June 3rd,2009

## *PART I: Comprehension Questions ( 30 marks )*

**I – Fill in the table on the answer sheet with information from the passage on liquid wood.**

**II – Which of the following characteristics make(s) Arboform a viable replacement to plastic? Select the best answers and write them on the answer sheet.**

a) recyclability
b) biodegradability
c) renewability
d) non-toxicity
e) attractiveness
f) low cost

**III – Give reasons why Arboform would be a potentially popular engineering material (apart from the environmental considerations)?**

**IV –Which factors led the scientists to search for alternatives to plastics?**

**V – Complete the following statements with information from the text:**

a) *High pressure hydrolysis is applied on thermoplastic so that it ...*
b) *It is possible for Arboform to be recycled, reshaped or molded, even if ...*
c) *Despite promising research, the production of bioplastics before Arboform had been developed could not be an option because...*
d) *CO2 emissions in the atmosphere have risen to an unprecedented level. In fact, they ...*

**VI –State whether the following are TRUE or FALSE. Justify your answers from the text.**

a) So as Arboform is produced massively, millions of trees have to be cut down.

b) Compared to traditional wood, liquid wood is not as resistant to stress.

**VII – Complete the flow chart on the answer sheet with information from the passage on the production of Arboform.**

**VIII – How does the writer explain the fact that the burning of liquid wood does not contribute to global warming?**

**IX - What do the following words (underlined in the text) refer to?**

a) One such alternative (§ 1 )
b) which ( § 3 )
c) their ( § 4 )
d) its growth ( § 10 )

**X – Find in the text words which have the closest meaning to:**

1. exhaustion; extinction ( § 1)
2. recently ( § 3)
3. thrown away; disposed of ( § 10)
4. harmless to the environment (§ 12)

## *PART II: Language ( 30 marks )*

**1. Choose the right alternative:**

Scientists[1] (***can't / wouldn't / had better not***) explain [2] ( ***how / why / when***) about 20 percent of the world's population is born left-handed. This means that the things most people do with their right hand, the left-handed do with their left one. [3] ( ***What / Such /How many)*** people eat, write and play tennis using their left hand. [4] ***(Thus / In addition / Indeed*** ), they kick the ball and score goals in football with their left foot! This ability of left-handed people makes it very difficult for right-handed sportsmen to compete [5] ( ***to / at / against***) their left-handed rivals. [6] ( ***While / However / Therefore*** ) left-handed players are used to [7] ( ***play / playing /have played*** ) with right-handed partners, right-handed athletes have less experience in dealing with left-handed ones.
[8] ( ***On the other hand / However / Consequently*** ), in other aspects of life it is not easy to be a left handed person in [9] ( ***the / a / Ø*** ) right- handed world. [10]
( ***Therefore / As a matter of fact / Alternatively***) some left-handed people try to learn to use their right hands even though it is very hard for them.

**2. Supply the correct tense and verb form :**

There [1] (**be**) a general feeling that computer games were bad for you, and books were good. Now people are not so sure. Researchers [2] (**find**) that computer games, television and the Internet have become key factors in boosting children's IQs up to levels never reached by past generations. The idea that intelligence can [3] (**measure**) was first suggested about a century ago, but at that time it was hard to find tests that [4] (**give**) useful results. Over the past two decades, however, tests [5] (**become**) more subtle and complex and researchers have found that IQ scores can give a good indication of what children's future exam results [6] (**be**). Some experts have even claimed that IQ scores can accurately predict what level of income and status young people [7] (**achieve**) in adult life. Why are today's youngsters doing so much better than their grandparents? Of course, better nutrition, higher standards of living and improved education all [8] (**play**) their part in [9] (**raise**) general levels of intelligence. But there seems to be more to it than that. Scientists [10] (**attribute**) the change in intelligence to the complexity of modern life.

**3. Use the right form of the word given between parentheses:**

Assaults on stand-alone and [1] (**network**) computers, called cyber attacks, are accelerating in frequency and [2] (**severe**) as the world relies [3] (**increase**) on world wide web applications for commerce, defense, research, education and health care. In particular, governments' operations have become [4] (**rely**) on the Internet and are, therefore, vulnerable to a variety of attacks. As a result, the need to [5] (**strong**) cyber security has become a top national priority for all governments.

**4. While keeping the same meaning, rewrite the following sentences as indicated on the answer sheets**

1. Recent studies haven't found any reliable evidence to prove that computer games contribute to long-term violence or anti-social behaviour.
2. A new system of imaging based on nanotubes can now take sharper and faster pictures.
3. I knew so little about astronomy that the lecture was difficult for me to follow.
4. Thanks to governmental support, researchers have been able to discover effective remedies for a number of diseases.
5. When shipping goods, it is advisable to use appropriate packaging.

## *PART III: Translation & Writing (20 marks)*

**A - Translate the following into English: ( 5 marks )**

Les industriels s'activent pour élaborer des techniques et des procédés de fabrication de produits bioplastiques qui n'utiliseraient pas de matières premières issues du pétrole. Ainsi, Tecnaro, une société allemande, vient de lancer un matériau dénommé Arboform. Ce dernier est réalisé directement à partir du bois.

**B - Write about the following topic in approximately 15 lines: ( 15 marks )**

Over time, the technology of our vehicles has changed dramatically and it will continue to evolve in the future. How do you imagine the car to be, fifty years from now, in terms of safety, technology, size, speed, etc?