REPUBLIQUE TUNISIENNE
Ministère de l'Enseignement
Supérieur, de la Recherche Scientifique et
de la Technologie
Concours nationaux d'entrée aux cycles de formation d'ingénieurs
Session 2007

الجمهورية التونسية
وزارة التعليم العالي والبحث العلمي والتكنولوجيا
المناظرات الوطنية للدخول
إلى مراحل تكوين المهندسين
دورة 2007

Concours Mathématiques et Physique, Physique et Chimie, Biologie et Géologie &Technologie
Epreuve d'Anglais

Date : Jeudi 07 Juin 2007 **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)

Making a business from solar home systems

1. **SELCO-India is a private business which has designed and sold over 48,000 solar home systems, powering electric lighting and small appliances for 220,000 people in Karnataka and other states in South India.**
   Around 46% of households in India do not have mains electricity, and for many others the supply is unreliable. The use of photovoltaic (PV) solar-home-systems (SHS) can provide reliable power for lighting and low-power appliances, which brings great practical benefits. Smoky, dangerous kerosene light is avoided, people have extended hours for work and study, and more opportunities for leisure and entertainment.
2. **Many programmes throughout the world have attempted to improve quality of life using SHS, but often they have not led to long term use and continuing markets. SELCO-India believes that the use of SHS will become widespread only if the system and after-sales service are of high quality, and if people want an SHS enough to pay for it. What they provide is properly designed and installed systems, excellent on-the-spot service and links to organisations which offer appropriate and affordable finance…**
3. **The core business of SELCO-India is the design and sale of photovoltaic (PV) solar-home-systems (SHS), principally for lighting, but also suitable for radios, cassette players and fans. A common system design supplies four 7W compact fluorescent lights (CFLs). Electrical power is generated by a 35 Wp PV module, which is usually mounted on the roof of a house. A 90 Ah (ampere-hour) lead-acid battery is used for storage, so that the system works both day and night and throughout the year. The batteries used are designed to withstand significant discharge each day without rapid deterioration. (Cheaper car batteries cannot withstand this, and would become unusable within about six months) An electronic charge-controller protects the battery from charging or discharging too much, and enables the battery to be used for at least five years. However, systems are individually designed to meet the needs (and budget) of each customer, and there are many variations which can be used. The installation of the system is carried out by SELCO technicians, and great emphasis is placed on appropriate siting of all components, and tidy wiring.**
4. **One innovative idea from SELCO to make systems affordable is to mount a light in the corner of one room and remove bricks into other rooms, so that a single light provides background illumination in three rooms. Another feature which allows flexibility at low cost is having lights which can be moved from one place to another, and installing the wiring and brackets for six lighting points in a four-light system…**
5. **A core principle of SELCO-India is that poor people are able to afford modern energy services - and that in the case of PV, an energy source which is regarded as expensive by the rich (in**

comparison with grid electricity) is actually cheap for the poor (in comparison with kero lamps and dry cell batteries). The main problem is lack of initial capital. SELCO does provide credit or loans, but has built up working relationships with local banks and microcr organisations over many years. This has given finance organisations the confidence to pro credit for PV systems, and an understanding of the payment terms which different owners need. Some users work directly with the finance organisations, others work through self-h groups which gives additional security that a loan will be repaid...

6. The immediate benefit to users is the provision of clean, good-quality light, and power for sm appliances. Good light improves morale and opportunities in ways which are difficult quantify. Children are able to study, domestic tasks are done more safely and easily, and the are increased opportunities for income generation...
7. There are significant environmental benefits from the PV systems. The immediate benefit is th the use of smoky, dangerous kerosene lamps is minimised. In addition, owners no longer use a dispose of dry-cell batteries. Families who use kerosene for lighting consume about 120 litres p year, so the 49 000 systems installed avoid the emission of about 14,000 tonnes of CO2 equivale per year...
8. The operation of SELCO has provided valuable employment opportunities. The total number employees is about 170, of whom about 145 are in the 25 local service centres... Employment h also been generated outside the company, including increased sales of small electrical applianc like fans and radios...
   Many of the benefits of the work of SELCO are particularly significant for women: they oft spend more time in the home and therefore appreciate the improved light and income generation opportunities. Many women take the responsibility of paying for the SHS, an through this, gain confidence in financial management. SHS owners were very pleased with thei systems, and clearly took pride in them.
   Within SELCO, 21% of service centre staff and 43% of head office staff are female, and thei sister-company has an entirely female workforce.
9. SELCO provides an excellent, replicable model for providing better energy services to poo people, while at the same time developing a thriving business. They have shown that sola electricity can be successful and affordable, provided that a proper service and financing syste is in place. Within India alone, 46% of households do not have grid electricity, and many mor have an unreliable supply, so the opportunities for similar enterprises are enormous.
10. SELCO aim to have installed 235,000 SHS by 2010, but also want to provide other energ services. One area which they would like to cover is the provision of cheap, improve cookstoves: savings on wood might also be linked to payments for the SHS.

Dr. Anne Wheldon, *Ashden Awards*, 200

PART I: Comprehension Questions (30 marks)

I – Fill in the table on the answer sheet with information from the passage describing the impact of the solar home systems on the given aspects.

II – Using information from the passage, supply the missing details in the table on the answer sheet.

III – Under which conditions can the solar home systems be widely adopted?

IV– Complete the following statement with information from the text:

Although the solar home systems (SHS) were primarily designed for .... they can also be used to operate home appliances such as ....

V -State whether the following are TRUE or FALSE. Justify your answers from the text:

a) Thanks to the new battery technology, Selco managed to design a solar home syste which is both standard and affordable.

b) The purchase of the solar home systems can be directly financed by Selco.

VI – From a technical point of view, how do solar home systems compare with conventional power systems?

VII – Explain in your own words:

"SELCO provides an excellent, replicable model for providing better energy services to poor people, while at the same time developing a thriving business" (§ 9)

VIII - What is the next step in Selco's strategy for providing an affordable energy service to the poor population?

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

a) they (§ 2)
b) this (§ 3)
c) which (§ 5)
d) them (§ 8)

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

1. to resist (§3)
2. to install (§ 4)
3. most important (§ 5)
4. prosperous (§ 9)

PART II: Language (30 marks)

1. Choose the right alternative :

[1] (***Although / Whereas / Since***) many countries have a health care system based on socialized medicine, in the United States, it is based on private health insurance. [2] (***However / Indeed / As a result***), unlike countries where taxes help provide accessible health care for the masses, the U.S. system is privately owned.[3] (***In addition / Thus / Yet***), it is generally considered to be terribly expensive. So, though many of the most highly acclaimed physicians in the world practise [4] (**a / *the* / *Ø***) medicine in the United States, these specialists are often inaccessible and unaffordable for [5] (***much / many / little***) of the public. To pay for medical services, American health insurance companies charge fees [6] (***at / on / in***) a regular basis and are generally paid for by individuals or by their employer. These regular fees are known as premiums.[7] (***Despite / Due to / In addition to***) these premiums, most clients [8] (***must / might / had better***) pay additional fees called deductibles.

Today Health Maintenance Organizations (HMOs) are very common. One advantage of using an HMO is that it often picks up the entire cost for the patient, including prescriptions. [9] (***As a consequence /However /Furthermore***), many patients do not like the fact that their HMO determines which physicians, including specialists, they can use. Most Americans would prefer to have more freedom of choice in determining [10] (***which / that / whom***) they can go to for their health care.

2. Supply the correct tense and verb form :

The orange groves of Valencia could soon be powering Spanish cars as a new technology is developed to turn the fruit's thick, shiny peel into biofuel.

In a region with 190,000 hectares [1] **(cover)** with oranges and lemons- many of which are left to rot on the trees- citric-powered cars could reduce pollution while using a readily available source of energy, according to local officials.

The presence of a Ford car factory, which [2] **(settle)** in the town of Almussafes a f years before, adds to the potential for the region. Oranges and lemons [3] **(cultiva** along the east coast since at least the 18th century and are still the region's bigg export product. Valencia [4] **(produce)** 4m tonnes of oranges a year, most of whi are squeezed into juice. Most of the 240,000 tonnes of waste [5] **(sell)** as animal fo but it could be turned into bioethanol. Each tonne of pulp could more than fill t average car's petrol tank, [6] **(produce)** 80 litres of fuel. Once the new juice pla planned for the region is completed, waste output [7] **(rise)** to 500,000 tonnes, a loc official said. Valencia intends [8] **(utilise)** the technology being developed in anoth orange-growing region of the world, Florida. If a distribution network around t Valencia region were installed, locals [9] **(pay)** about 40% less per litre than what th [10] **(pay)** currently for petrol.

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

What is [1] **(create)**? To many people, a creative person is anyone who has gr imagination or an [2] **(invent)** mind. To others, it is only someone who is [3] **(arti** gifted, such as a painter, writer or architect. This term has been defined as that whi brings into existence, causes or produces new and effective ideas or ways of doi things. According to this definition, a person who is considered creative could inclu someone from almost any walk of life.

One characteristic many psychologists have agreed upon as being common to creati types is an insatiable curiosity. This [4] **(end)** desire to know more, experience mo and discover more seems to apply to all creative types. That is the [5] **(physics)** w discovered penicillin or the inventor of a microchip or of a more efficient way to p bills over the phone, can be thought of as creative, and perhaps just as creative Picasso or Mozart.

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

1. Technology is changing our lives.
2. It is unnecessary to carry out this experiment for the time being.
3. The conventional batteries do not last as long as the nanotechnological ones do.
4. "We will change the assembly line we installed three years ago" the mana promised.
5. The findings of our research should not be published before they are fully endorsed the research team.

PART III: Translation & Writing (20 marks)

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

Depuis le 19ème siècle, la consommation d'énergie n'a cessé de croître d'une fa exponentielle. Il a été consommé dans le monde autant d'énergie en 2005 qu'e 1950 et 1960. Les efforts visent actuellement à promouvoir les activités qui diffuseront plus de produits toxiques et permettront, en même temps, aux plus pau de satisfaire leurs besoins fondamentaux dans ce domaine.

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

Some people claim that advances in science and technology have made our world better and safer. To what extent is this true, according to you?

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Session :.....**Concours :**.....

Signature des surveillants

Ne rien écrire ici

Epreuve de :.....

Nom :.....**Prénoms :** .....

Institution d'origine :.....

Total des doubles feuilles remises
.....1.....

Identifiant : | | | | | | | | **Série :** | | |

✂ ----------

Ne rien écrire ici

Concours Nationaux d'Entrée aux Cycles de Formation d'Ingénieurs

Total des doubles feuilles remises
.....1.....

Session :...Juin 2007.....**Concours :** Toutes options.....

Epreuve de : **ANGLAIS (ANSWER SHEET)**.....

NE RIEN ECRIRE DANS CETTE COLONNE

PART I :

I –

Health	
Environment	
Life-style	
Women's living conditions	

II -

Organization	**location**	**Field of activity**	**Targeted social group**	**Size of workforce**
Selco				

III - a) _____

b) _____

c) _____

IV-

Although the solar home systems (SHS) were primarily designed for _____ they can also be used to operate home appliances such as _____

_____

Ne rien écrire ici

NE RIEN ECRIRE
DANS CETTE COLONNE

V –

a) [ ] _____

_____

b) [ ] _____

_____

VI – _____

_____

_____

VII - _____

_____

_____

VIII – _____

_____

_____

IX - a) _____

b) _____

c) _____

d) _____

X- 1. _____

2. _____

3. _____

4. _____

Ne rien écrire ici

NE RIEN ECRIRE DANS CETTE COLONNE

PART II :

1.

1	
2	
3	
4	
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10	

2.

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8	
9	
10	

3.

1	
2	

3	
4	

5	

4.

1. Our lives _____
2. This experiment _____
3. The nanotechnological batteries last _____
4. The manager promised that _____
5. Not until they are fully endorsed by the research team, _____

PART III :

A – Translation:

B – **Writing:**