Epreuve du 1er groupe

A N G L A I S

Plastics – leading car design

"Thanks to plastics, the cars we dream of today are quickly being developed – offering high performance, cleaner driving and advanced safety and convenience features."

As we enter an era of mass customisation, where products will increasingly be tailored to meet individual requirements, diversity will become the new rule. Cars will come in all shapes and sizes, metamorphosing into new 'part-car part- truck' combinations. Plastics' versatility and flexibility will support the trend in the automotive industry to build very different cars based on the same chassis and a core set of components, thus reducing research and development time and the retail price.
Plastics-based composite materials will substantially reduce the weight of the future car and, as a result, less energy will be required to propel it. In fact, the 100kg of plastics that have been added to the average car have already displaced 200 to 300kg of other materials.

Thanks to lightweight plastics, driving 50 kilometres on one litre of fuel will soon be possible and the commercialisation of electric cars that need just 40kW instead of the 120kW a conventional-size vehicle requires today, could be only a few years away. As we move into the next century, cars will be fitted with hybrid engines that draw their energy from a combination of sources including fuel, plastics-based solar panels, batteries and fuel cells which generate electricity catalytically from hydrogen thus further reducing emissions of CO2.

In 20 years time, cars may even drive themselves, using satellite based Global Positioning Systems (GPS) to take their passengers safely to the nearest hotel on a cross-country trip. New plastics are increasingly being tailored to meet the needs of the electronic car of the future.
Looking forward to the 21st century, plastics in automotive applications will continue to contribute significantly to the drive towards building better, safer and cleaner cars.
The plastics industry will continue to work closely with the automotive industry to meet this challenge by developing technologies and products to turn transport dreams into a reality.

I. READING COMPREHENSION.

A. *Match Words with their corresponding definitions.* (**01.5 marks**)

WORDS	DEFINITIONS	ANSWERS
1. Automation	**a.** The state of being suitable and useful	**1.** ____
2. Customisation	**b.** The act of implementing the control of equipment with advanced technology.	**2.** _____
3. Flexibility	**c.** Having a wide variety of applications	**3.** _____
4. Convenience	**d.** Conceptual whole made up of complicated and related parts.	**4.** _____
5. Versatility	**e.** Quality of being adaptable or variable	**5.** _____
6. Composite	**f.** Making to meet individual requirements	**6.** _____

B. *Match the characteristics and the illustrations of the dream car.* (**02 marks**)

CHARACTERISTICS	ILLUSTRATIONS	ANSWERS
7. Cleaner driving	*a.* hybrid engines	7. -------
8. Advanced safety	*b.* using GPS	8. -------
9. High performance	*c.* cars may drive themselves	9. -------
10. Convenience features	*d.* all shapes and sizes	10. -------
11. Customisation	*e.* reduced emission of CO_2	11. -------
12. Versatility	*f.* reduced weight	12. -------
13. Flexibility	*g.* tailored to meet individual needs	13. -------
14. Diversity	*h.* combination of fuel, plastics based-solar panels, batteries, fuel-cells	14. --------

C. *Find the correct information in the text.* (**02 marks**)

15. Features that **"**Part-car part-truck**"** cars have in common:

a. ……

b. ……

16. Impact of the new materials on cars:

a. ……

b. ……

17. Technical features of the cars:

a. ……

b. ……

c. ……

d. ……

D. *Fill in the gaps with the correct words from the list below:* (**02.5 marks**)

AUTOMOTIVE – COMPOSITE- AVERAGE – TAILORED - CHALLENGE - TREND

18. By increasing safety and comfort features, the ……..… weight of the car has raised from 1015 kg in 1990 to 1132 kg in 1998.
19. With advances in polymer technology ……..… components such as bumpers, remain in perfect shape, even at high temperatures.
20. The use of ……..… materials to replace traditional ones, has contributed to produce lighter, thinner, and yet stronger plastic parts.
21. In terms of performance and security, the development of plastic components is a big ……..… in the car industry.
22. The replacement of more traditional and heavier materials by plastics, involves the provision of ……..… solutions to meet new individual requirements.

Epreuve du 1er groupe

II. LINGUISTIC AND COMMUNICATIVE COMPETENCE.

E. *Find the correct derivatives of the words in bracket.* (**01.5 marks**)

23. The development of this new car technology will be ……. (**benefit**) to both manufacturers and users in the future.
24. To reduce energy consumption and pollution by fossil fuels, it's become ……. (**urgency**) to design lighter parts with convenient materials.
25. Some car parts can be improved ……. (**qualitative**) without any impact on the overall cost of vehicles.

F. *Put the verbs in brackets in the correct tenses and forms.* (**03 marks**)

In the first years of the automotive industry, cars **26.** ……..… (**compose**) of rather rudimentary parts in quite simple designs. Throughout the years, it *27.* ……. (**become**) a fashion to manufacture bigger and heavier vehicles, until serious threats on nature like pollution and global warming ***28.*** ……. (**raise**) awareness on the imperious necessity to act accordingly to preserve it. At the moment, many tests **29.** ……. (**be** / **carry out**) in the car manufacturing industry to produce new materials. Prospects for the next generation ***30.*** ……. (**be**) not so briliant and designer ***31.*** ……. (**expect**) to find solutions to the problem as soon as possible.

G. *Reformulate using the prompts given.* (**02 marks**)

32. They had never carried out any previous research aimed at reducing car weight before.
This is the first time ……
33. Although car manufacturers are willing to reduce car prices, they are confronted with the high cost of investments on research.
Despite …….

H. *Put the words in brackets in the comparative or superlative.* (**01.5 marks**)

Between conventional and new technologies, Africans will have to identify which one is **34.** ……. (**GOOD**) adapted to their specific contexts. It is obvious that the **35.** ……. (**LESS**) expensive ones will be the **36.** ……. (**MUCH**) accessible to them.

III. WRITING

Choose one topic and write a passage of not more than 150 words. (***04 marks***)

TOPIC 1:

Global warm has now become a worldwide issue and cars are considered as one of the biggest contributors to climate change. As an expert, you have been asked by the

government of your country to help reduce the impact of transportation means on global warming. Write about the problems you have identified and suggest some solutions.

TOPIC 2:

The import of second-hand vehicles contributes to more car pollution in developing countries. Do you think that manufacturing spare parts locally could be an alternative in order to cut down on carbon emissions and pollution in your country. Give your reasons.

Epreuve du 1er groupe

A N G L A I S

Lightning may never strike the same place twice, but your phone doesn't need to know that. **That**'s because a group of scientists from the University of Southampton have teamed up with Nokia to explore the possibility of *harnessing the energy of a lightning bolt* to charge a mobile device.

Sound impossible? Well, the scientists have already done it. In order to create a "lightning bolt" for their test, the team first generated an alternating current through a transformer. They then channeled that current between a gap that was a little under an inch thick, *surging 200,000 volts* — well within the average strength of a typical lightning strike — in the form of a bolt of electricity. The signal was then transferred into another controlling transformer, where it was able to charge the battery of a Nokia Lumia 925. "As one of the first companies to introduce wireless charging into our products, we believe that this experiment has the potential *to jump-start new ideas* on how we charge our phones in the future," Chris Weber, Nokia's vice president of sales and marketing, told *Phys.org*.

This research indicates that we may one day harness the power of a lightning strike for our own personal use. Consider **the energy implications,** which reach beyond cellphone charging: lightning is totally renewable, incredibly sustainable and readily available. Neil Palmer, one of the project's lead researchers, said Nokia presented them with the original idea for the experiment. This is not surprising coming from Nokia, a company that is known for *pushing the boundaries* and constantly researching new concepts and technologies. Palmer said that the circuitry of the Nokia device was able to stabilize the signal of the lightning, **which** then allowed the battery to be charged. This is important to note because one of the main arguments against the notion of harnessing lightning for energy has been that lightning is too unpredictable. **"This discovery** proves devices can be charged with a current that passes through the air," he said, "and is a huge step towards understanding a natural power like lightning and harnessing its energy."

Using the power of lightning has long been *a staple of science fiction.* But if this experiment proves anything, it is that some of those seemingly impossible scenarios depicted in science fiction may soon become a reality.

Do you think we should harvest lightning for energy?

By Samantha DEAN
http://mashable.com/2013/10/05/nokia-lightning-phone-charge)

Foot notes:

1 coup d'éclair

I. READING COMPREHENSION

A. Title for a text:

1. Choose the letter corresponding to the suitable title for the text. ***(1 mark)***

a. Nokia creates a new cellphone
b. Creating lightning bolts from electricity
c. Charging cellphones with energy from lightning

B. W*hat do the words in bold refer to in the text? ……(2 marks)*

2. *"**that**" (paragraph 1): ……*

3. *"**the energy implications**" (paragraph 3)……*

4. *"**which**" (paragraph 3):……*

5. *"**This discovery**" (paragraph 3): ……*

C. Are the following statements TRUE or FALSE? Put T or F and justify by quoting the text. (3 marks)

6. Lightning power is now being used as a source of energy.
……
……

7. This experiment is one of Nokia's first research programs on new concepts and technologies.
……
……

8. There have been many experiments on the power of lightning in the past.
……
……

D. Complete the table using information from the text. ***(1.5 marks)***

Project initiators	**Purpose of the project**	**Conditions for testing the idea**	**Characteristics of the current from the lightning**
9. …… **10**. ……	**11**……	**12.** …… **13.** ……	**14.** ……

E. Choose the letter corresponding to the meaning of the expressions. **(2.5 marks)**

15. "harnessing the energy of a lightning bolt" ***means***

a. controlling the energy of a lightning bolt
b. distributing the energy of a lightning bolt
c. exploiting the energy of a lightning bolt

16. "surging 200,000 volts" ***means***

a. charging 200,000 volts
b. transforming suddenly 200,000 volts
b. producing up to 200,000 volts

17. "to jump-start" new ideas: ***means*** *to*

a. stimulate new ideas
b. consider new ideas
c. present new ideas

18. "pushing the boundaries" ***means***

a. measuring the limits
b. reducing the limits
c. increasing the limits

19. "a staple of science fiction" ***means*** *a main*

a. step in science fiction
b. discovery in science fiction
c. object of science fiction

II. LINGUISTIC COMPETENCE

F. Complete the sentences with the appropriate link words in the box. ***(2 marks)***

BECAUSE — ON ACCOUNT OF — ALTHOUGH — THANKS TO - DESPITE

20. Our authorities should invest more on alternative sources of power ---------- the energy dependence of our country.

21. ……..the experiment on lightning energy is full of promises, we cannot tell when power from a lightning will ever be put to use.

22. ……..the result of this first experiment, charging one's telephone or any other device has not been a reality yet.

23. The rural areas will be provided with electricity - - - - - - - - - - - - - - - - - this new energy programme.

G. Reformulate the sentences using the prompts given. ***(2 marks)***

24. Chris Weber told Phys. org: "We believe that this experiment has the potential to jump-start new ideas about charging mobile phones."
Chris Weber said that----------

25. Scientists may one day harness the power of a lightning strike for our personal use.
It is possible for ----------

26.If investments in scientific research increase, economic benefits will also increase.
The ----------**the investments in scientific research, the**----------**the economic benefits**.

27. It was a pity that they didn't push far enough to get a solution.
They should ----------

H. Put the verbs in brackets in the correct tenses. ***(2 marks)***

Abdul's computer broke down last week. He ---------- **[28] (CANNOT)** use it to complete his work. Furthermore, Microsoft ---------- **[29] (DECIDE),** starting from April 8th, to stop any support to computers using Windows XP. Therefore, Abdul ---------- [30] **(HAVE TO)** buy a new one running on Windows 7 next week if he ---------- **[31] (WANT)** to finish his work as soon as possible.

III. WRITING *(4 marks)*

32. Choose one of the topics and write a passage of about 150 words.

Topic 1:
Harnessing lightning for charging a device is now possible. Now, considering lightning, solar and other energy sources, which form of energy, would you say, is more appropriate for African countries? Why?

Topic 2:
For African countries to develop, what would you advise them to do in order to encourage innovations or improvements of existing technologies?

OFFICE DU BACCALAUREAT
B.P. 5005 – DAKAR – Fann - Sénégal
Serveur Vocal : 628 05 59
Téléfax (221) 864 67 39 - Tél. : 824 95 92 - 824 65 81

Durée : 02 heures
Série : S3 - Coeff. : 02

Epreuve du 1er Groupe

ANGLAIS

Late Improvements on Toyota's Tacoma TS3

Toyota is the brand to beat in many automobile segments — reliable family sedans, fuel-sipping hybrids, luxury crossovers[1], etc. — but Toyota has not ruled more supremely as compact pickups[1]. Some seven million compact/mid-size Toyota trucks have been sold in the U.S. since 1964, and for the last two decades, all of them have been named Tacoma, or "Taco," by its legions of enthusiasts.

In recent years, thanks in part to Toyota's hegemony as well as the dwindling number of mini-truck competitors as the Big Three[2] focused on full-sizers[1], the Tacoma has only galvanized its lead in the small truck arena. So why change anything?

Well, because no car or truck can remain fresh after more than a decade on the market, no matter what its competitive landscape looks like. And not insignificantly, the Chevy Colorado and GMC Canyon reappeared for 2015, looking and driving better than ever. Suddenly, with its defective old engine and four- and five-speed transmissions, the Tacoma has become a dinosaur.

Fortunately, Toyota is just about ready with a replacement, due in showrooms by the end of 2015 as a 2016 model and which has just made its debut at the 2015 Detroit auto show. At first blush, it's clear that Toyota's designers took a cautious approach to the Tacoma's styling, resulting in a truck that looks more like it was refreshed than completely redesigned. But, every body panel is new, all the way from the raised hood back to its locking, easy-close tailgate[3]…

Customers will be able to have their 2016 Tacoma five ways: SR (think work truck), mid-grade SR5, TRD Sport, TRD Off-road[1], and Limited, the latter getting leather seating, JBL sound, and a host of other creature comforts. Other available amenities include wireless device charging, keyless engine starting, dual-zone climate control, a moonroof, and more. All Tacoma models will come with a Go-Pro mount near the rearview mirrors, for you adventure-seekers…

Toyota gave few details about the Tacoma's defects, but did say that high-strength steel was added to the Tacoma's frame, with ultra-high strength steel used in the body shell.

Footnotes:

1. types of vehicles **2.** General Motors, Ford and Chrysler (biggest American car manufacturers) **3.** door at the back of a pick-up

READING COMPREHENSION *(9 marks)*

A. ***Find in the text the words corresponding to the definitions.*** *(2 marks)*

DEFINITIONS	WORDS
1. Places where vehicles are displayed to the public.	**a.** ----------
2. Unshared leadership in a particular field.	**b.** ----------
3. They are car parts allowing the driver to look backward.	**c.** ----------
4. Combining two different systems in a car.	**d.** ----------

B. ***Read the text and choose the best option (circle*** a, b***, or*** c***)*** ***(1.5 marks)***

5. "***Toyota is the brand to beat***"*means*

a. Toyota is designing a new prototype.

b. Toyota is a declining leader in car manufacturing.

c. Toyota is the top car maker.

6. "***The dwindling number of mini-truck competitors***" *means mini-trucks were getting:*

a. more numerous in the market.

b. lower in number in the market.

c. more competitive in the market.

7. "***Tacoma has become a dinosaur***" *suggests that Tacoma is*

a. much stronger.

b. old-fashioned now.

c. Strange.

C. ***Complete the chart with information from the text.*** ***(2 marks)***

Toyota's most popular model.	**8.** ----------
Model privileged by the major car manufacturers.	**9.** ----------
Models in competition with the Tacoma.	**10.** ---------- **11.** ----------
Part improved with new technological development.	**12.** ----------
Material used to improve the part.	**13.** ----------
Accessories related to the Tacoma motor and battery.	**14.** ---------- **15.** ----------

D. ***Say if the statements are TRUE or FALSE. Justify by quoting from the text.***
(3 marks)

16. The replacement for the Tacoma is now available to the public.

---

17. Toyota and the Big Three have the same focus.

---

18. The Chevy Colorado and the GMC Canyon were no match to the Tacoma.

E. ***Which idea appears in the text? Circle the number corresponding to the correct answer.*** ***(0.5 marks)***

19. At first, Toyota didn't want to replace the Tacoma because other car companies didn't produce many trucks.

20. The Chevy Colorado and the GMC Canyon lost their competiveness in 2015.

21. There are aspects of the Tacoma which reminds of the old one.

LINGUISTIC COMPETENCE **(7 marks)**

F. ***Complete the paragraph with the appropriate form of the verbs in brackets.*** ***(2marks)***

At last, Toyota ---------- [22] (**DESIGN**) a new truck model to replace the Tacoma. In fact, it ---------- [23] (**EXHIBIT**) a few weeks ago at the Detroit Auto Show. But consumers ---------- [24] (**ONLY, HAVE**) it at the end of 2015, and enthusiasts are looking forward to ---------- [25] (**GET**) one whatever the cost.

G. ***Reformulate each statement using the prompts given.*** ***(2 marks)***

26. ***The*** Tacoma remained competitive on the mini-track arena because the Big Three concentrated on full size cars.

Owing to the Big Three ----------
---

27. A piece of technology may remain popular, but it has to be replaced at a certain age.

Although ----------

H. ***Fill in the blanks with the right form of the words in brackets.*** ***(3 marks)***

Age is a real enemy of technology. In fact, any equipment, whatever its ---------- [28] (**POPULAR**), is likely to lose its ---------- [29] (**COMPETITIVE**) after a given time. This ---------- [30] (**APPLICATION**) to all manufactured items. Think of Apple, a computer and phone ---------- [31] (**PRODUCE**); in a few years, it has made a lot of different devices perhaps to bring significant ---------- [32] (**INNOVATE**) in the field. That's the law of the ---------- [33] (**TECHNOLOGY**) world.

WRITING ***(4 marks)***

Choose one of the following topics and write a passage of not more than 150 words.

Topic One:

The number of cars has dramatically increased in urban areas. How negatively does this situation impact on people's quality of life?

Topic Two:

Car manufacturers have introduced electric cars in the market. What do you think are the main reasons for this introduction? Give your opinions.

16 G 32 A 01
Durée : 02 heures
Série : S3 - Coeff. : 2
Epreuve du 1er Groupe

A N G L AI S

Surveillance Drones

Surveillance drones or unmanned aerial systems (UASs) raise significant issues for privacy and civil liberties. Drones are capable of highly advanced surveillance, and drones already in use by law enforcement can carry various types of equipment including live-feed video cameras, infrared cameras, heat sensors, and radar. Some military versions can stay in air for hours or days at a time, and their high-tech cameras can scan entire cities, or alternatively, zoom in and read a milk carton from 60,000 feet. They can also carry wifi crackers and fake cell phone towers that can determine your location or intercept your texts and phone calls. Drone manufacturers even admit they are made to carry "less lethal" weapons such as tear gas[1] or rubber bullets[2].

Thanks to a provision in the FAA Modernization and Reform Act of 2012, drone use in the United States is set to expand rapidly over the next few years. The Act includes provisions to make the licensing process easier and quicker for law enforcement, and by 2015, commercial entities will also be able to apply for a drone authorization.

In January 2012, EFF sued the Federal Aviation Administration (FAA) under the Freedom of Information Act to determine which public and private entities had applied for authorization to fly drones. In response to the lawsuit, the FAA has released lists of the 60 public entities and 12 private drone manufacturers that have sought permission to fly drones in the US. The agency has also released several thousand pages of records related to the entities' drone license applications.

The FAA has yet to provide information on how these drones will be used. EFF has also partnered with MuckRock, the open government organization, to conduct a "drone census" with the goal of determining just that. "We have provided an easy-to-use form that ordinary citizens can use to file a public records request with their local police agency to ask what type of surveillance the agency plans to conduct with drones, if any, and what type of privacy protections it is providing its citizens".

Privacy law has not kept up with the rapid pace of drone technology, and police may believe they can use drones to spy on citizens with no warrant or legal process whatsoever. Several bills are currently going through Congress, which attempt to provide privacy protection to Americans who may be caught up in drone surveillance. As the numbers of entities authorized to fly drones accelerates in the coming years—the FAA estimates as many as 30,000 drones could be flying in US skies by 2020—EFF will continue to push for transparency in the drone authorization process and work to ensure the privacy of all Americans is protected.

https://www.eff.org/fr/issues/surveillance-drones

FOOTNOTES:
1. gaz lacrymogène **2**. balles en caoutchouc

READING COMPREHENSION **(8.5 marks)**

A. Match ideas with the corresponding paragraphs of the text. **(2.5 marks)**

Ideas	Paragraph n°
1. Opening perspectives for drone use in the USA	----------
2. The voting of laws and regulations to achieve transparency in flying drones authorization.	----------
3. Legal decisions to make public the names of organizations allowed to use drones	----------
4. Surveillance capacities of drones	----------
5. Citizens' demands on the way drones are being used	----------

B. ***Say whether the statements are*** **TRUE** ***or*** **FALSE**. **Choose T or F and** ***justify quoting from the text.*** **(3 marks)**

6. Surveillance drones are highly advanced devices, but they have a limited range of detection. **T / F**
Justification:----------
---

7. Reforms on law enforcement for drones tend to restrict their use. **T / F**
Justification: ----------
---

8. The American citizen is involved in the process of regulating how drones will be used. **T / F**

---

9. Legal measures have been taken in advance, which guarantee protection of liberties. **T / F**
Justification: ----------

C. ***Complete the fact file using information from the text.*** **(2 marks)**

DRONES SURVEILLANCE IN THE USA

Agency regulating drone use :	**10.** ----------
New legal arrangements due to the reform:	**11.** ---------- **12.** ----------
Entities authorised to fly drones	**13.** ---------- **14.** ----------
Problems raised by drone surveillance:	**15.** ---------- **16.** ----------
The fundamental social value EFF intends to protect	**17.** ----------

D. ***Find in the text words corresponding to the following definitions.*** **(1 mark)**

DEFINITIONS	WORDS
a. Aircrafts without human pilots on board (**para. 1**)	**18.** ----------
b. Proposed legislations under consideration for approval by Congress (**para. 5**)	**19.** ----------
c. Watch someone secretly without their knowing it. (**para. 5**)	**20.** ----------
d. A proceeding in a court of law brought by one party against another (**para 3**)	**21.** ----------

E. LINGUISTIC COMPETENCE **(7.5 marks)**

Reformulate the sentences using the prompts given. **(3 marks)**

22. He asked the lawmakers to issue laws regulating surveillance drone use in the country.
He had ----------
---

23. The growing use of drones in industry will reduce workers' exposure to hazardous situations.
The more the use of drones in industry, ----------
---

24. The EFF sued the FAA because they didn't know how drones would be used.
Had the EFF known ----------

F. ***Complete the sentences using the word or expression in bold with the correct prefix.*** **(1.5 marks)**

e.g.: manned systems **---->un**manned systems

25. With the FAA Modernisation and Reform Act of 2012, Americans are **able to** get drone license quickly.
The FAA Modernisation and Reform Act of 2012 will ---------- Americans to get drone license quickly.

26. Privacy advocates fear that the citizens will not feel **easy** about the use of drones when they know that what they do in private can be shown in public.
Privacy advocates fear that the citizens will feel ---------- when they know that what they do in private can be shown in public.

27. The EFF has been complaining about a drone use based on processes which are **not legal**.
The EFF has been complaining about a drone use based on processes which are ----------.

G. Reformulate using the correct form of the verbs in the box to replace the words in italic in the sentences. **(2 marks)**

SPY ON/ CARRY OUT / CATCH UP / BRING DOWN

28. Under EFF pressure, American police have ***reduced*** the number of surveillance drones on American citizens.
Under EFF pressure, American police have----------
----------.

29. The authorities have decided not to ***conduct*** an opinion poll on the use of surveillance drones this year.
The authorities have decided not to ----------
----------.

30. The new legislation which is going through Congress will not allow drone users to ***watch secretly*** any citizens' activities.
The new legislation which is going through Congress has provisions that will prevent drone users from----------

31. As drone use in the United States expands, the number of honest American citizens ***involved*** in drone surveillance might increase.
As drone use in the United States expands, the number of honest American citizens ----------
----------.

H. Ask questions corresponding to the words or expressions in bold. **(1 mark)**

32. Some military drone versions can stay in air ***for hours*** at a time.
----------?

33. Their high-tech cameras can read a milk carton from ***60,000 feet***.
----------?

I. WRITING: **(4 marks)**

34. ***Choose one topic and write a passage of not more than*** **150 words**.

Topic One:
Citizens in most developed countries are confronted with security problems. Sophisticated systems like drones are used to improve citizens' safety. Do you think that the loss of privacy which can result from that situation is too high a price to pay?

Topic Two:
Modern technologies are created by humans to help them in various activities. These technologies tend to create great dependence. It seems that we cannot do without machines. Do you think we should let machines control our lives? State your opinion.

Pays : Sénégal	**Année** : 2017	**Épreuve** : Anglais, LV1, 1er Groupe
Examen : BAC, Série S3	**Durée** : 2 h	**Coefficient** : 2

THOSE INCREDIBLE FLYING MACHINES

FLYING a helicopter is tricky, especially when hovering. You use your left hand to raise and lower the collective-pitch lever (to climb or descend), your right hand to move the cyclic-pitch joystick (to go forwards, backwards and sideways) and both feet to work the anti-torque pedals (to point the nose). At first it all seems like an impossible dance, but with plenty of practice and careful co-ordination it can be mastered. Flying a drone, by comparison, is very easy. .Some can be operated with little or no experience using only a smartphone application.

One passenger drone undergoing flight tests is the Volocopter VC200. It consists of 18 separate rotors, and its makers, e-volo, a company based in Karlsruhe, Germany, claim it is more stable than a conventional helicopter.

The attraction of drones is their ease of operation. Unlike most helicopters, hovering drones use multiple rotors. Many drones are based on a design called a quadcopter, which employs four rotors on arms adjusted 90 degrees to each other. Each rotor is directly driven by an electric motor. By turning two of the rotors clockwise and two anticlockwise it counters the twisting effects of torque produced by a single-rotor helicopter (without a tailrotor to push against the torque, a helicopter would spin hopelessly round and round). Moreover, whereas a helicopter needs to vary the pitch of its blades (the angle at which they attack the air) in order to manoeuvre, the multiple rotors on a drone have a fixed pitch. The drone instead manoeuvres by independently changing the speed of one or more of its rotors under computer control. As this set-up requires fewer and less complex moving parts than a helicopter, it makes drones simpler, cheaper to build and maintain, and potentially more reliable.

The VC200 has an all-in weight of 450 kg and, in its present form, a flight duration of 30 minutes. After completing a series of flight tests the VC200 should be fully certified by 2017 in a category of aircraft known as an ‘"ultralight”.

The market for passenger drones in their various forms could be huge. Beside military and commercial operations, they would have a large number of leisure uses. They also open up new possibilities for a combination of manned and unmanned flight.

Adapted from the ‘**Science and Technology**’ print edition of The Economist Newspaper, 2016.

FOOTNOTES

1. **Torque**: force de torsion
2. **To spin** round and round: tournoyer
3. **Blade**: pale (chacun des éléments de forme vrillée, fixés au moyen d’un rotor).

I- READING COMPREHENSION (08 *marks*)

A. Complete the table below using the words in the box.

Quadcopter ; computer ; smartphone application ; cyclic-pitch joystick ; tailrotor

OPERATIONS	**PARTS**
It can allow an inexperienced operator to fly a drone.	**1…**……
It provides the possibility to fly drones from a distance.	**2**……
It increases the maneuverability of the drone by changing the speed of its rotors.	**3**……
It prevents the helicopter from spinning round and round.	**4**……
It allows the helicopter to move in three different ways.	**5**……

B. Write down the letter corresponding to the correct meaning.

6. **'It all seems like an impossible dance'** means:
- a) Flying helicopters are compared to dancing machines.
- b) Coordinating all the movements to fly a helicopter seems impossible.
- c) Flying a helicopter means performing impossible manoeuvres.

7. **'Incredible flying machines'** suggests that:
- a) Drones are piloted in a fascinating way.
- b) Drones offer many possibilities of use.
- c) People are amazed by drones.

8. **'Manned flight'** means flying an aircraft: a) with men and women as the crew.
b) that men operate from a distance.
c) programmed by men for specific machines.

9. **'A hovering helicopter'** means a helicopter whose position is:
- a) stationary.
- b) moving sideways.
- c) moving forwards and backwards.

C. Write down the letter corresponding to the right answer.

10. Making a drone is more economical than making a helicopter because:
- a) A drone needs fewer components.
- b) A helicopter has more functions.
- c) Operating a drone is simpler.

11. The license for the VC200 to fly
a) may be very difficult to get.
b) may have already been approved.
c) will not be issued.

12. Passenger drones may be……for the populations.
a) unattractive
b) very attractive
c) risky

D. Complete the table with appropriate information from the text.

	DRONES	**HELICOPTERS**
How they are operated	**13**……	manually
Number of rotors	Use multiple rotors	**14**……. supplemented by a tailrotor
Way of eliminating twisting effect	**15.** by …….	Eliminate twisting effects of torque with a tail rotor
Pitch (angle attack of the air)	**16.** …….	Vary the pitch of its blades

II- LINGUISTIC COMPETENCE (08 *marks*)

E. The sentences in A have a modal auxiliary (should/could/needn't/must). Match each sentence with the modality expressed by the modal auxiliary.

Modalities: Absence of necessity/Strong probability/ Expectation/Possibility

A- Sentences	**B- Modalities**
After being submitted to a series of tests, the VC200 should be certified.	**17.** ……
The market for passenger drones could offer large job opportunities.	**18.** ……
They needn't touch any button, it's an automatic system.	**19.** ……
That aircraft must be a jumbo jet.	**20.** ……

F. Put the verbs in brackets in the correct tense.

In the 20th century, designers (**21**). .... (**focus**) mainly on increasing the speed of aircrafts. The start of the new millennium (**22**). .... (**mark**) by a shift towards more automation and autonomy.

Up to now, machines (**23**)..... (**create**), which for a large part (**24**). ..... .

..... (**operate**)
by trained crews. But the current trend (**25**)..... .....(**go**) to the production of unmanned machines
totally dependent on new sophisticated technologies. However, the decision of the Aeronautics Authorities (**26**)…….(**influence**) their future application in sensitive domains like the military.

G. Reformulate the sentences using the prompts given.

27. Access to remote areas was so difficult, they used drones to collect the information they needed.

If access to remote areas had been easy,……

28. Although flying a helicopter is very difficult, practice and organization can help master it.

H. Match each sentence with the corresponding function from the box.

ABILITY / CAUSE / CONTRAST / PURPOSE

Sentences	**Functions**
Unlike most helicopters, hovering drones use multiple rotors.	**29.** …….
As the set-up requires fewer and less complex moving parts, it makes drones more reliable.	**30.** …….
To manoeuvre, a helicopter needs to vary the pitch of its blades.	**31.** …….
After they had completed a series of flight tests on the VC200 they could issue a certificate in the category of 'ultralight'.	**32.** …….

III- WRITING (04 *marks*)

Choose <u>one</u> topic and write about 150 - 200 words on it.

33. <u>TOPIC 1:</u>

Do you think that it is a good option to develop automated systems in industrial and financial services (use of robots in car assembly lines and the use of credit cards in banks)? Support your arguments.

34. <u>TOPIC 2:</u>

Drones are used in the military (to carry missiles and other weapons), and in the civilian (to survey areas which are difficult of access, take photographs, etc.).
Which use of drones would you encourage?