

**Ostfalia Hochschule für angewandte Wissenschaften
Fakultät Fahrzeugtechnik**

Klausur: Technisches Englisch 2 für Fahrzeugtechnik
Semester: Sommersemester 2022
Datum: 9.6.2022
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Bearbeitungszeit: 60 Minuten (+ 15 Minuten für Speichern/Zurücksenden)

Hilfsmittel: alle Vorlesungsunterlagen, Wörterbuch Englisch-Deutsch/Deutsch-Englisch

Nach Ende der Bearbeitungszeit (60 Minuten) speichern Sie die Klausur bitte wie folgt

„TE 2 Nachname_Vorname“ (z.B. „TE 2 Muster_Max“)

und senden Sie an mich unter

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zurück.

Dadurch, dass Sie die bearbeitete Klausur an mich zurücksenden, bestätigen Sie, dass Sie die Klausur eigenständig und ohne andere als die oben angegebenen Hilfsmittel bearbeitet haben.

Viel Erfolg!

GRAMMAR

1) Conditionals: Fill in the verb in the correct form.

___/3 p.

1) If these tests produced positive results, we would have continued (continue) the experiment.

2) If the tests didn't show (not / show) any results, we would have stopped the clinical trials.

3) The cable car accident wouldn't have happened (not / happen) two weeks ago if the safety measures had been followed.

4) If we buy a new software package, we will be (be) able to do all the technical specifications in half the time.

5) Generally, we can say that iron rusts (rust) if you leave it in water.

6) Students could use (use) the laboratory again if Corona restrictions are loosened.

2) Reported speech:

___/4 p.

The following sentences are direct speech. Turn them into reported speech (indirect speech).

1) Tom said: "I will do an internship with a car manufacturer next semester."

Tom said he would do an internship with a car manufacturer next semester.

2) Tom said: "The company is working on a project to reduce emissions at the moment."

Tom said the company was working on a project to reduce emissions at the moment.

3) Tom wanted to know: "How long have you been interested in the topic of emissions?"

Tom wanted to know how long you had been interested in the topic of emissions

4) Tom told me: "Hand in your application to this company and don't forget to include your CV!"

Tom told me to turn in my application and reminded me to include the CV.

TEXT

(20 + 5 points)

Read the following text and answer the questions in your own words and in full sentences:

Hydrogen-powered trains

Hydrogen-powered trains are arguably the greenest trains out there. “Mini power stations on wheels”, is how Alex Burrows from the University of Birmingham describes them.

He is the project director for the ‘Hydroflex’ train, which has been showcased at an event in the West Midlands, Britain, recently. Unlike diesel trains, hydrogen-powered trains do not emit harmful gases, instead they use hydrogen and oxygen to produce electricity.

It is “a fully green fuel”, says Helen Simpson from rail rolling stock company Porterbrook, which created the ‘Hydroflex’ in partnership with Birmingham University’s centre for Railway Research.

However, hydrogen trains are still incredibly rare. The only two in active service in the entire world are in Germany. Britain is looking to become one of the next countries to start running them. And the ‘Hydroflex’ is a prototype train where the technology is being tested.

There are many types of fuel cells, but they all consist of an anode, a cathode, and an electrolyte that allows positively charged hydrogen ions (protons) to move between the two sides of the fuel cell. At the anode, a catalyst causes the fuel to undergo oxidation reactions that generate protons and electrons. The protons flow from the anode to the cathode through the electrolyte after the reaction. At the same time, electrons are drawn from the anode to the cathode through an external circuit, producing direct current electricity. At the cathode, another catalyst causes hydrogen ions, electrons, and oxygen to react, forming water.

Individual fuel cells produce relatively small electrical potential, about 0.7 volts, so cells are stacked, or placed in series, to create sufficient voltage to meet an application’s requirements. The energy efficiency of a fuel cell is generally between 40-60%; however, if waste heat is used for other purposes like e.g. heating, efficiencies up to 85% can be obtained.

In the ‘Hydroflex’ train, the tanks, the fuel cells and the batteries sit inside a carriage where passengers would normally sit. In future commercial models, that equipment will have to be stored away above or beneath the train.

So why is all this happening now? The answer is quite simple: a quarter of Britain’s trains run on diesel and the government wants the diesel trains to be gone by 2040. (375 words)

Vocabulary:

(to) showcase – (to) present to the public, often at a trade fair

Questions:

1. Why does Alex Burrows describe the fuel cell trains as “mini power stations on wheels”? [2 p.]

Because they create electricity using hydrogen and oxygen like power stations.

2. Which fuel is used in the ‘Hydroflex’ and what is the by-product of the process? [3 p.]

Hydrogen and oxygen is used in the ‘Hydroflex’ and when they react, they produce water.

3. Which advantages of fuel cells as a means of power generation are given in the text?
Name three aspects. [3 p.]

The main benefit of hydrogen fuel is the eco-friendliness.
The by-product of the chemical reaction is organic water which is very harmless.
This provides a solution to Britain's goal of eliminating diesel powered trains by 2040.

4. Why do fuel cells have to be stacked? [2 p.]

The fuel cells generate around 0.7V Volts, which is too low to power a train.
Therefore, they need to be stacked in order to create sufficient voltage.

5. Your opinion: Why are there only two trains in the world using fuel cell technology? Also name disadvantages of fuel cell technology in your answer. [5 p.]

Hydrogen trains are a new technology, which is quite far from being fully developed.
Disadvantages would be the overall cost making it less desirable by companies and manufacturers. Additionally, Hydrogen must be extracted from water using a lot of energy.

6. Your opinion: What do you think – would fuel cells also be an alternative for powering cars? [5 p.]

On the one hand, fuel cells would provide another alternative to internal combustion vehicles.
However, they are expensive and not as efficient as electric cars, as the extraction of hydrogen costs a lot of money and energy.

FURTHER TOPICS

(29 + 3 points)

1) Performance and technical specifications

1.1) Which technical specifications should be given in order to have meaningful information about a car? Name three aspects. (Answer in key words.) [3 p.]

- Fuel economy
- Acceleration
- Power

1.2) How does the Cd-value influence the performance of a car? (Answer in a full sentence.) [2 p.]

The drag coefficient describes how aerodynamic a car is. The lower the cd-value the faster the car is and the better the fuel efficiency will be.

1.3) Which performance feature affects the precision of steering at high speed? (Write down a key word.) [1 p.]

- Suspension

1.4) Which performance feature gives information about how heavy a car is without any passengers in it and with half a tank of fuel? (Write down a key word.) [1 p.]

- Kerb

2) Vehicle safety features

2.1) What is the difference between an active and a passive vehicle safety feature? Answer the question (in a full sentence) and give one example of each category. [4 p.]

Passive safety features are hidden features that don't react until you get in an accident for example airbag, whereas active features are constantly working to keep drivers safe, e.g., ABS.

2.2) Which vehicles safety features that are used to avoid an accident should be included in every car? Name two! (Answer in key words.) [2 p.]

- Electronic stability program
- Automated emergency braking

3) Plastics / Bioplastics

3.1) What is the difference between thermoplastics and thermosetting plastics? (Answer in full sentences.) [3 p.]

Thermoplastics are plastics, that can be reshaped when heated, while thermosetting plastics can't be reshaped when heated.

3.2) Bioplastics seem to be the solution to the growing amounts of waste due to conventional plastics. Briefly explain two disadvantages of bioplastics. (Write in full sentences.) [4 p.]

Bioplastics will make people not feel as bad when they litter. Furthermore, Bioplastics won't dissolve in a landfill.

4) Manufacturing

4.1) Mass production of cars was facilitated through the invention of the assembly line. Explain what lean manufacturing is as opposed to ordinary mass production. Refer to its origin, its concept and the effects that it has on the workers. (Write in your own words and in full sentences.) [4 p.]

Lean manufacturing focuses on not wasting resources and to increase the satisfaction of the customer. It produces "just enough" so that no product goes to waste.

Mass production, on the other hand, refers to the large-scale manufacturing of a product.

4.2) Decide if the following statements on agile manufacturing are true (T) or false (F). Correct the false ones in full sentences. [5 p.]

a) Agile manufacturing has been practiced since the invention of the assembly line. T / F

-False. It was practiced after the invention of the assembly line.

b) Agile manufacturing focusses on an increased flexibility in producing products to satisfy customer wishes. T / F

-True

c) In agile manufacturing the idea is to achieve less with fewer resources. T / F

-False. The idea is to achieve more with fewer resources.

d) Agile manufacturers can easily move from the assembly of one product to the assembly of another with a minimum of retooling and software. T / F

-True

e) In agile manufacturing, a common data base on parts and products is shared among the departments of the company that are involved in the production processes. T / F

-True