**QUESTION 1 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 01**

Why is the Brazilian capital Brasilia a prime example of a traffic planning mistake?

**Select one:**

When developing downtown Brasilia, the planners forgot to include sufficient parking spaces for

commuters.

Brasilia failed to incorporate helicopter landing pads on its main buildings, as in São Paulo. As a result, it has no infrastructure for air taxis.

As a comparatively young city, Brasilia failed to incorporate the growing popularity of the car into its traffic route planning.

When planning Brasilia, too much emphasis was placed on cars, and interconnecting different modes of transport was largely ignored.

**QUESTION 4 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 01**

What are the four dimensions of smart mobility technology?

**Select one:**

Vehicle technology, intelligent transport systems, mobile communications, carsharing

Carsharing, carpooling, ride-hailing, bike-sharing

Vehicle technology, intelligent transport systems, data, new mobility services

Electric drives on water, land, air and public transport

**QUESTION 8 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 01**

Tesla has disrupted the car market quite significantly. How would you describe the future prospects for the company and the technology?

**Select one:**

Tesla will inevitably be taken over by one of the major car manufacturers, perhaps purely

in order to gain control of the patents and ensure that the transition to electric mobility does not threaten their core business.

Tesla will soon have to file for bankruptcy regardless of how many cars it can sell, because the technology will be replaced by hybrid engines.

In the not-too-distant future, Tesla will replace Amazon as the world’s most expensive company,

regardless of how successful the technology becomes.

It is difficult to gage the company's prospects, but whatever happens to Tesla, the

technology itself is on the verge of a permanent breakthrough.

**QUESTION 11 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 01**

Smart mobility is often hailed as the solution to a range of urban development-related problems. What are they?

**Select one:**

Policymakers are relying on rapid growth in the cities, but many new buildings do not have basements so there are not enough parking spaces available.

Many of the vehicles currently on the roads predate smart technology, so it is

impossible to know the precise number of cars and their location on the roads at any given time, and traffic lights cannot be modified accordingly. This creates congestion.

The traffic situation in the cities is deteriorating as cars become cheaper and accessible to more people. Diesel cars, in particular, are very cheap and sold in large numbers, which exacerbates the environmental and health problems still further.

*The traffic situation in many cities is constantly deteriorating, primarily due to rapid,*

*unchecked growth that the transport infrastructure was never designed for.*

Which of the following recommendations is **not** one of the EU Commission’s proposals for tackling the challenges of fast-growing cities?

**Select one:**

Improve interconnections between existing modes of transport.

Create additional parking space in inner cities.

Create alternatives to car ownership.

Create a smart traffic control system.

**QUESTION 12 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 01**

**QUESTION 18 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 01**

What distinguishes “Industry 4.0” from other automated production processes?

**Select one:**

“Industry 4.0” is synonymous with the further acceleration of automated production processes through faster data processing.

There are no differences. “Industry 4.0” is just a buzzword that means

the automation of production processes.

Digitalization will make the comparatively flexible designing of “Industry 4.0” processes possible.

“Industry 4.0” represents the digital reproduction of automated analog production processes.

**QUESTION 21 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 01**

Which of the following cities is best suited to a “clean and shared” strategy for implementing smart mobility solutions?

**Select one:**

Sydney, Australia’s largest city, with around 4 million inhabitants and a per capita income of around $ 60,000

Westerland on the island of Sylt with around 9,000 inhabitants and a per capita income of approximately € 33,000

Washington D.C., the capital of the United States, with around 700,000 inhabitants and a per capita income of approximately $ 57,000

*Jakarta, the capital of Indonesia, with around 10 million inhabitants and a per capita*

*income of approximately $ 12,000*

**QUESTION 27 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 02**

Which of the following statements is correct? Carsharing is…

**Select one:**

…the technical term for the simultaneous use of a car by several people.

…particularly attractive to people who own their own cars because it allows them to make money from them.

…a concept that predates the Second World War, but did not achieve its breakthrough

until the arrival of digitalization.

…the technical term for the sequential use of a vehicle by several people.

**QUESTION 30 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 02**

Which accusations are typically made against Uber in multiple different markets?

**Select one:**

*Unfair competition, wage dumping, and failure to comply with safety standards*

Data privacy infringements and software piracy

Unfair competition, a non-transparent pricing policy, and data privacy infringements

Wage dumping and environmental pollution

**QUESTION 34 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 02**

What role could cable cars potentially play in a modern inner-city mobility concept?

**Select one:**

Cable cars could be used as a substitute for buses, which spend all their time sitting in traffic jams in many major cities.

Cable cars could complement existing mobility services and help to connect new districts and geographically complex regions to the public transport network.

Cable cars could replace subways, which are very expensive to maintain. Existing subway stations could be repurposed as cable car stations.

20 to 30 years from now, cable cars will probably be the main mode of transport in all major cities in newly industrializing and developing countries.

The success of a new mobility concept may also depend on its acceptance by people who have no intention of using it themselves. Give a recent example of this.

**Select one:**

**QUESTION 35 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 02**

|  |
| --- |
| The protests against the proliferation of carsharing vehicles taking up precious parking spaces in Germany’s city centers |
| The protests against free public transport tickets for students and apprentices, expected to lead toincreased public transport use |
| The protests against the widespread introduction of special e-car parking spaces |
| The protests against the sudden proliferation of Asian rental bicycles in major German cities |

**QUESTION 39 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 02**

Sharing models are already in place for which vehicles and modes of transport?

**Select one:**

Cars, bicycles, and motorcycles

Cars, bicycles, and electric scooters

Cars, buses, and bicycles

Cars, bicycles, motorcycles, and electric scooters

**QUESTION 43 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 02**

What is the German equivalent of the American “Greyhounds”?

**Select one:**

The ICEs, which are white rather than gray in Germany

Intercity buses, such as those operated by Flixbus

The blue-gray police cars

The gray speed camera boxes (also known as “flashboxes”)

**QUESTION 46 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 02**

Intercity buses are **not** welcomed by all policymakers. What proposals were designed to make the use of intercity buses **less attractive** and benefit the railways?

**Select one:**

Banning intercity buses from overtaking on motorways, which would drastically reduce their average speeds and make travelling by bus less attractive.

Calls for intercity bus company authorization to be limited to all-electric vehicles.

Proposals for the simultaneous introduction of a bus toll and rail fare reductions.

The introduction of a bus toll and a special levy on bus tickets

that would be allocated directly to the railways (the “train-euro”).

**QUESTION 56 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 03**

According to studies, how long does the average person spend planning a one- to two-day business trip?

**Select one:**

There are no such studies.

Up to an hour.

Ten minutes.

Three hours.

**QUESTION 57 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 03**

Which of the following is **not** an element of the Mobility-as-a-Service concept?

**Select one:**

The ability to purchase integrated tickets for the entire journey

Automatic tips on the cheapest times to travel

All essential information being integrated into a single app or platform

Individualized mobility packages

Which two types of tax revenue could decrease significantly if e-cars and carsharing are introduced across the board?

**Select one:**

**QUESTION 62 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 03**

|  |
| --- |
| Petroleum and electricity taxes |
| Energy and petroleum taxes |
| Car and petroleum taxes |
| Car and energy taxes |

**QUESTION 64 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 03**

There are two different Mobility-as-a-Service business models. The platform operator either acts as a broker, or…

**Select one:**

…makes its money from advertising displayed on the platform whenever a user

buys a ticket or views a timetable.

…operates as a software provider and receives a fixed fee from the company for using the app.

…buys up the various companies wishing to offer their services via the platform.

…operates as a customer of the individual mobility service providers and bundles these services

into a package for resale.

**QUESTION 67 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 03**

Why are falling petrol prices a problem for public finances?

**Select one:**

*Energy taxes are levied per delivery unit and are therefore independent of*

*price fluctuations. However, the state also generates revenues from VAT charged as a percentage surcharge on the price of petrol. Hence, if petrol prices fall, VAT revenues will also fall*.

The fuel tax is levied in stages. If the price of super petrol drops below € 1.40 per liter,

the tax rate is halved.

The state earns more from new car purchases, especially new e-cars. Low petrol prices reduce

the incentive to switch to electric mobility, which in turn reduces tax revenues.

Germany buys crude oil and sells it to the filling stations. If prices

drop, the margins for previously purchased oil will be lower.

**QUESTION 68 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 03**

E-cars do **not** use petrol, so the way they are taxed…

**Select one:**

…is no different; only the vehicle tax is relevant. Energy taxes are transitory items that accrue back to taxpayers.

…is very different from vehicles with conventional drive systems. While the latter pay a fixed rate of

energy tax per liter of fuel consumption, electric cars only pay an electricity tax.

…is currently significantly more advantageous for customers. From 2022, however, taxes will be gradually adjusted to avoid discriminating against conventional drive systems.

…is problematic for the state coffers. This has prompted some countries, such as Denmark, to trial a tax per kilometer driven, regardless of the drive system.

**QUESTION 73 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 03**

Which critical requirements in the mobility sector do experts hope to achieve by implementing the 3GPP or 5G mobile standard?

**Select one:**

Sufficient data rates to allow the nationwide streaming of advertisements, which could be used to finance development of the required infrastructure

*Lower latency times, improved reliability, comprehensive availability, and energy-efficient communication protocols*

Cryptographically protected, energy-saving communication protocols based on the blockchain system

Higher data rates, lower costs, and increased levels of acceptance among the population

**QUESTION 80 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 04**

What is meant by “intermodal”?

**Select one:**

“Intermodal” is the next generation of high-speed trains that can switch readily from one track gauge to another when crossing national borders.

*“Intermodal” means passengers must interrupt their journey to switch from one mode of transport to another.*

“Intermodal” means passengers must change trains at least once, but their transport class (ICE, IC, RB, etc.) remains the same.

“Intermodal” is a combination of international and multimodal. It means that passengers must

cross at least one national border and switch to a different mode of transport.

**QUESTION 81 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 04**

What additional information is most likely to change people’s behavior when deciding between using their own car and alternatives?

**Select one:**

Information about congestion-related delays en route has

the greatest influence on behavior.

Information about the greenhouse gases saved by not driving

has the greatest influence on behavior.

Information about anticipated parking charges has the greatest influence on behavior.

Information about congestion-related delays en route and potential parking issues

has the greatest influence on behavior.

**QUESTION 84 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 04**

Whether a road user owns a Google or Apple smartphone…

**Select one:**

…correlates closely with their decision to buy their own car. Apple users

are five times more likely to buy their own car.

…correlates closely with their decision to buy a 1st or 2nd class ticket. Apple users are five times more likely to buy a 1st class ticket.

…correlates closely with their decision to use Mobility-as-a-Service offerings. Many of the

required apps are not available from the Apple Store.

…is less relevant when choosing between using their own car and the alternatives than whether they own a smartphone at all.

**QUESTION 85 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 04**

The reason for a journey…

**Select one:**

*…clearly influences the chosen mode of transport, at least when distinguishing between work-related and private journeys.*

…is completely irrelevant to the chosen mode of transport.

…only influences the travel class booked, but not the chosen mode of transport.

…clearly influences the chosen mode of transport, at least with regard to distance.

**QUESTION 87 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 04**

|  |
| --- |
| About |
| Moovel |
| SharooName the Israeli mobility startup that Volkswagen has invested heavily in.**Select one:** |
| Gett |

**QUESTION 88 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 04**

What is the risk as soon as a digital platform strategy becomes successful?

**Select one:**

Oligopolization or even monopolization will soon follow, in keeping with the motto “The winner takes it all”.

Successful platforms often use their powerful market position to cut their employees’ wages.

People do not like monopolists. When a company becomes very successful, some customers will move to alternative platforms.

The larger a platform becomes, the more difficult it is to comply with data privacy regulations.

**QUESTION 92 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 04**

Why is it misleading to claim that there are always a certain number of sharing vehicles available for customers at any given time?

**Select one:**

Some of the vehicles may appear as available but are not located in a public car park and are therefore unavailable to use.

Some of the vehicles may not be in use but may be reserved.

Some of the vehicles may be out of service due to defects but appear as available.

*Customers are only interested in available vehicles in the immediate vicinity. Available vehicles in a different location are of no benefit to the customer.*

**QUESTION 104 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 05**

Which of the following technologies are satellite-based systems?

**Select one:**

The Chinese technology WEIBO and the Russian technology GLONASS

DriveX and FOND

WLAN and Bluetooth

GPS, Galileo, GLONASS

What does the abbreviation “ETSI” stand for?

**Select one:**

**QUESTION 110 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 05**

|  |
| --- |
| Energy and Telecommunications Standards Institute |
| European Transportation Security Institute |
| Energy and Transportation Security Institute |
| European Telecommunications Standards Institute |

**QUESTION 113 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 05**

Who developed the Global Positioning System?

**Select one:**

A team of Google developers based on their analysis of search queries, many of which focused on places

A Silicon Valley start-up, which called itself “GPS” and was later bought by Google

An international consortium of scientists using the open source

principle

The U.S. Department of Defense

**QUESTION 120 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 05**

In which format and via which protocol is data transmitted to terminal equipment by positioning systems such as GPS?

**Select one:**

In NMEA 0183 format using the GPS protocol

In NMEA 0183 format using the ASCII protocol

In ASCII format using the GPS-0183 protocol

In ASCII format using the NMEA 0183 protocol

**QUESTION 121 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 05**

Why do roads with multiple access and exit routes, car parks, or zebra crossings create problems with the “Green Wave”?

**Select one:**

A “Green Wave” can only be identified if vehicles pass at least three traffic lights in

succession. The aforementioned factors mean that the majority of vehicles are excluded from the statistics.

The “Green Wave” only works when there are a few cars on the road. Access routes and

car park exits increase the number of vehicles, making it increasingly difficult to implement.

This statement is false. The examples listed are not a problem and are easily incorporated into the control system by Artificial Intelligence (AI).

The “Green Wave” relies on accurate forecasting of average

speeds. The more disruptions there are (like the examples mentioned here), the less accurate these calculations will become.

**QUESTION 123 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 05**

What is the underlying principle of all location systems, regardless of whether they originate in the US, Europe, or China?

**Select one:**

The Russian glasnost principle, which uses artificial intelligence (AI) and big data

to determine position with exceptional accuracy

The principle of triangulation, which combines data from satellites in three different states to precisely determine position

The Russian glasnost principle, which uses string theory findings to determine position with exceptional accuracy

The principle of triangulation, which combines data from three measuring points to determine a precise location

**QUESTION 129 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 05**

Which of the following positioning systems uses the Cell of Origin method?

**Select one:**

Satellite-based and fixed line

Telecommunications and WLAN

Location tags and network

Bluetooth

**QUESTION 130 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 06**

What does the “X” in “Car2X” stand for?

**Select one:**

The “X” represents the application providers who develop value-added services from the data generated by cars.

The “X” stands for low-level X-rays, which cars use to communicate with each other.

The “X” stands for other vehicles with which the car can communicate automatically.

*The “X” stands for other vehicles and infrastructure with which the car*

*can communicate automatically.*

**QUESTION 136 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 06**

Which of the following statements about automotive safety systems is true?

**Select one:**

There are only a few new developments with the potential to make cars safer. A general

speed limit on the roads is the only option left.

For many decades, the development of automotive safety systems focused primarily on

passive safety systems.

The focus of automotive safety has shifted away from active systems controlled by the driver in

favor of passive systems requiring zero intervention by the driver.

Many car manufacturers are still ignoring calls for more active safety systems that

could help prevent accidents from occurring rather than simply reducing their impact.

**QUESTION 141 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 06**

What is so special about the Smart Parking application operating in California?

**Select one:**

It allows you to pay parking charges via the app so you do not need to walk to the parking meter.

It allows you to reserve free parking spaces at your destination up to 15 minutes in advance.

It acts as a broker between private owners of parking spaces at the destination and drivers looking for spaces and also handles the payments.

*It analyzes demand and uses this information to regulate the price of parking spaces. The more demand there is, the higher the prices become, and vice versa.*

**QUESTION 142 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 06**

How much is the market for driving assistance systems expected to grow by between 2012 and 2019?

**Select one:**

By up to € 2 billion

The market is expected to double

By 3% per annum

By more than 200%

**QUESTION 143 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 06**

What measurable effects has the Smart Parking app achieved in California?

**Select one:**

Greater parking precision has significantly reduced the incidence of cars taking up two parking spaces.

*Time spent waiting for parking spaces has been significantly reduced, as has the distance traveled in search of a parking space.*

The average employee works 13 minutes longer per day because they waste less time looking for parking spaces.

Chauffeur services, such as taxis or Uber, have seen huge increases in business

 as people choose them over their own cars to avoid parking problems.

**QUESTION 153 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 06**

Which two industries are united in calling for the implementation of Car2X solutions and which standard are they promoting?

**Select one:**

The automotive and telecommunications industries are working together to promote the IEEE 802.11p standard.

The supplier and consulting industries are working together to promote the IEEE 802.11p standard.

The supplier and consulting industries are working together to promote the 3GPP standard.

*The automotive and telecommunications industries are working together to promote the 3GPP*

*standard.*

**QUESTION 154 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 06**

What are the key requirements to qualify as an ITS?

**Select one:**

Data exchange standards must be bindingly defined to ensure the correct functioning of an integrated Transport System (ITS).

An Intelligent Transport System (ITS) will only work if the underlying Artificial Intelligence (AI) is able to learn from a large number of data records. The systems must, therefore, devote some time to data collection before an ITS system can be used.

Data exchange standards must be bindingly defined to ensure the correct functioning of an Intelligent Transport System (ITS) .

An Integrated Transport System (ITS) will only work if the underlying Artificial Intelligence (AI)

is able to learn from a large number of data records. The systems must, therefore, devote some time to data collection before an ITS system can be used.

**QUESTION 159 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 07**

Why did the UbiGo project in Gothenburg decide to offer a 24-hour hotline, even though only 195 people participated in the project?

**Select one:**

The hotline used artificial intelligence (AI) rather than real people to answer inquiries,

so there were no significant additional costs for round-the-clock operation.

The taxi drivers’ union had made this a condition. The hotline was operated via the taxi switchboards and helped to safeguard jobs.

Participants were able to use the modes of transport free of charge, but the project organizers did not want them to feel that they were scrimping on service.

The decision was driven by the conviction that behavioral changes would only be achieved

if the barriers to using alternatives are relatively simple to overcome.

**QUESTION 160 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 07**

The UbiGo project in Gothenburg was discontinued after a six-month trial period. Why?

**Select one:**

There was a high level of acceptance among participants, but the concept was underdeveloped for continuous use.

Insufficient acceptance among carsharing providers. Mobility-as-a-Service offerings are unattractive without carsharing to anchor them.

There was a change of government, and a different transport policy was agreed.

Due to insufficient acceptance among participants.

**QUESTION 165 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 07**

Which of the following modes of transport **cannot** be accessed in any city’s Mobility-as-a-Service solutions?

**Select one:**

Aircraft

Limousines from the mayor’s fleet

Minibuses

Ferries

**QUESTION 166 OF 297**

**DLBINGSM01\_MC\_mittel/Lektion 07**

Which of the following accurately lists the modes of transport available to use as part of individual Mobility-as-a-Service solutions?

**Select one:**

Only ferries, buses, and ski lifts

Only buses, metros, and inter-city buses

*Only ferries, minibuses, and planes*

Only carsharing, air taxis, and bike-sharing

**QUESTION 176 OF 297**

**DLBINGSM01\_MC\_leicht/Lektion 07**

Daimler subsidiary moovel claims to be the market leader of which North American market (as at 2018)?

**Select one:**

Smart mobility

Mobility-as-a-Service

Real-time navigation

Mobile ticketing applications

**QUESTION 91 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 07**

Imagine you are a taxi operator. Which questions are particularly relevant when considering participating in a Mobility-as-a-Service pilot project?

**Select one:**

How will my passenger volumes change? And what happens to my tips

if tickets are booked in advance via a platform and no cash changes hands?

What about taxi drivers who cannot use digital technology? And will I have to convert all my taxis to electric mobility to be eligible to participate?

How do I prevent the services offered through the Mobility-as-a-Service platform from cannibalizing my core business without compensation? And what about taxi drivers who cannot use digital technology?

How do I prevent the services offered through the Mobility-as-a-Service platform

from cannibalizing my core business without compensation? And how will my passenger volumes change?

**QUESTION 184 OF 297**

**DLBINGSM01\_MC\_schwer/Lektion 07**

The Daimler subsidiary moovel bases its business model on two pillars (as at 2018). What are they?

**Select one:**

In some projects, such as SSB Bestpreis, moovel acts as a consumer brand, while in others it functions as a white label app developer.

In some projects, such as SSB Flex, moovel acts purely as an app developer in the background. It also operates as an end customer brand with its own app.

In some projects, such as SSB Flex, moovel acts purely as an app developer, while in others

it purchases volume packages from mobility service-providers and resells them via its apps at a profit.

In some projects, moovel acts as a broker for mobility services, while in others, it purchases volume packages from mobility service-providers and resells them via its apps at a profit.

**QUESTION 98 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 01**

**Are the following statements true or false? Outline your reasons in a single sentence for each one.**

1. **“The overall volume of passenger kilometers has grown in recent years, but there are huge differences between different modes of transport. While airlines are booming, trains and public local transport have suffered a significant decline.”**
2. **“Passenger kilometers across all modes of transport have increased since 1990, but with a moderate average annual growth rate of 1.2%.”**
3. **“The increase in passenger kilometers in recent decades is partly related to globalization.”**
4. **False. Although growth rates vary, all modes of transport have seen increases.**
5. **False. The average annual growth rate since 1990 is significantly higher, at 3.3%.**
6. **True. The expansion of global trade has created a middle class in countries like China and India, and this class is now more mobile.**

(6 points – 2 points per statement – 1 point for true/false, 1 point for justification)

**QUESTION 188 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 01**

1. **The EU Commission issued three recommendations for tackling the challenges associated with rapid growth in cities. Name them and arrange them in order of relevance. Consider how much effort each recommendation would entail and how quickly it can be implemented.**
2. **Are there any other recommendations you would add to the list?**
3. **The EU Commission’s recommendations are:**
	* **Create alternatives to car ownership.**
	* **Improve interconnections between different modes of transport (both public and private).**
	* **Introduce smart traffic controls to minimize congestion.**

**(3 points – 1 point per answer)**

Smart traffic controls are probably the fastest to implement, using existing infrastructure. Different modes of transport can also be interconnected comparatively quickly using modern technology and without the need for massive investment (Mobility-as-a-Service); access to data may prove more challenging. Creating effective alternatives to car ownership is a consequence of the other two recommendations, along with other (technological) advancements. This cannot be the starting point.

(3 points – 1.5 points for listing in the correct order, 0.5 points for each justification)

1. **There are numerous possible answers to the last question. Creative answers will also count, provided they are not completely absurd. Here are a few correct answers:**
	* **Investments in conventional infrastructure**
	* **Investments in digital infrastructure**
	* **Making the outskirts of towns and regions with a low population density more attractive**
	* **Developing cycle paths**
	* **Promoting e-mobility**
	* **Creating new traffic levels (cable cars etc.)**

**(2 points for each reasonable proposal)**

**QUESTION 189 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 01**

1. **List two possible pros and cons of free local public transport.**
2. **Under which circumstances could this be successful?**
3. **Possible pros:**
	* **Eliminates the need for expensive control systems**
	* **Faster access to traffic systems and increased throughput rates**
	* **Positive social impacts (social inclusion, mobility) (Max. 2 points – 1 points per item)**

Possible cons:

* + **Added pressure on the current lack of space and capacity in public transport**
	+ **The possibility of rural dwellers having to finance the services of their urban counterparts**
	+ **An extra incentive to move to the city**

**(Max. 2 points – 1 point per item)**

1. **If the capacity of public transport can be expanded, perhaps by repurposing the road infrastructure or creating new levels of transport (cable cars), the model could be a success. Costs must be fairly distributed to avoid one-sided subsidies.**

(Max. 2 points – 1 point per answer)

**QUESTION 193 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 01**

**Name the four different technological dimensions of smart mobility, illustrating each one with a use case.**

The four technological dimensions are:

* **New vehicle technologies – Example: E-cars, e-bikes, e-air taxis**
* **Intelligent transport systems (ITS) that connect road users with one another and with infrastructure – Example: Car2X systems**
* **Data-based real-time services – Example: Car2X systems, Mobility-as-a-Service platforms, real-time traffic situation (congestion, parking space availability)**
* **New mobility services – Example: Mobility-as-a-Service platforms (4 points/4 points – one point per item)**

**QUESTION 103 OF 297**

**DLBINGSM01\_Offen\_schwer\_F1/Lektion 01**

1. **What is the definition of “smart mobility” from a societal perspective?**
2. **Which elements of this definition are likely to face the greatest practical hurdles? Why?**
3. **Finally, explain why this is only one pillar of smart mobility. What other definition must be added, and which dimensions does it incorporate?**
	1. **Definition of smart mobility: A visionary yet feasible mobility of the future. Applicable to and usable by everyone regardless of location and region, regardless of utilization period and duration, and regardless of individual abilities and budgets (0.5 points per item, total 2.5 points).**
	2. **The biggest practical problems are to create mobility that is independent of location and region and accessible to everyone, regardless of their individual abilities and budget (1 point per item, total 2 points).**

While the future may bring self-driving vehicles that can be used by people without a driving license or those with severe physical disabilities, this is not currently an option. Free mobility is not on the horizon at present (0.5 points per item, total 1.5 points). Moreover, the development of smart mobility solutions is very biased towards major cities and conurbations, particularly the city centers.

Rural regions and the suburbs of large cities will be waiting some time to get connected (0.5 points per item, 1 point in total).

* 1. **We need a more specific societal definition of smart mobility, because the current one is rather vague. The second pillar (the technological definition) makes it more tangible. This technological definition includes the four dimensions of vehicle technology, intelligent transport systems, data-based services, and new mobility services (0.5 points per item, 3 points in total).**

**QUESTION 110 OF 297**

**DLBINGSM01\_Offen\_schwer\_F1/Lektion 01**

1. **What is the big leap between automation levels 5 and 6 of a completely self-driving vehicle?**
2. **Describe the regulatory requirements that must change to make this step possible. Also, consider any conditions that may become void or irrelevant.**
3. **The final monitoring tasks by humans are eliminated between the 5th and 6th levels of automation. The vehicle is now controlled entirely by the system, and there is no driver to intervene, only passengers. Consequently, there is no responsible driver; responsibility rests with the manufacturer or insurer.**

(5 points – 1 point per answer)

1. **Required regulatory changes (other examples are also possible):**
	* **Regulation of liability issues in the event of accidents**
	* **The general authority to operate without a driver**
	* **New requirements for vehicle testing, with a stronger focus on electronics**
	* **Adaptation of data privacy rules**
	* **Regulation of whether it is acceptable for cars to simply drive around without parking**
	* **Regulation of the transitional period when cars with differing degrees of automation are on the roads simultaneously**
	* **Abolition of the driving license (5 points – 1 point per answer)**

**QUESTION 205 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 02**

1. **Identify and describe the specific hurdles that must be overcome in peer-to-peer carsharing.**
2. **In which sector other than mobility does the principle of peer-to-peer sharing work well? How is this different?**
3. **In peer-to-peer sharing, the shared vehicles are privately owned; in the other two sharing concepts, they belong to the service provider. There are two major differences that also constitute obstacles. Firstly, insurance and liability issues are more difficult to clarify and enforce. For example, if a shared car is caught by a speed camera and the driver is unwilling to pay, it is very difficult for a private individual to enforce a claim against the driver.**

(2 points)

Secondly, there is an emotional component: People are reluctant to share their belongings with complete strangers. Particularly with cars, there is no guarantee that someone else will treat them with the same degree of care as you yourself would.

(2 points)

1. **This principle is already widely used in the housing rental sector (e.g., Airbnb).**
2. **Financial necessity is one reason. A (vacant) apartment hits the wallet harder than an unused car. Moreover, areas of the apartment can be excluded from use and personal possessions can be locked away. This is not possible with a car.**

(2 points)

**QUESTION 206 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 02**

1. **Describe the differences between sharing, pooling, and hailing in terms of the timing sequence and service description.**
2. **Briefly describe the benefits of sharing and pooling.**
3. **Which of the two concepts is ride-hailing most closely related to?**
4. **Sharing is sequential use of a vehicle; you drive yourself. Pooling is simultaneous use of a vehicle; you either drive yourself (provider) or travel as a passenger (customer).**

Ride-hailing can be either sequential or simultaneous use of a vehicle; you travel as a passenger by booking a service with driver.

(3 points – one point for each correct description of sharing, pooling, and hailing)

1. **Advantages of sharing: You are flexible in terms of time and space – it is like having your own car. (Max. 2 points – 1 point per answer)**

Advantages of pooling: Cost-saving, resource-saving, and good capacity utilization of each vehicle. (Max. 2 points – 1 point per answer)

1. **Ride-hailing is most closely related to pooling because of the option of simultaneous use. (1 point)**

**QUESTION 207 OF 297**

**DLBINGSM01\_Offen\_schwer\_F1/Lektion 02**

**Briefly describe the problems faced by innovative mobility services due to opposition from citizens. Give five different, realistic examples.**

Example of smartification of the infrastructure: In many cities, citizens’ initiatives have already been mobilized against all types of transmitters (usually telecommunications masts). There is a similar situation with wind turbines. Things look set to escalate over the next few years.

Example of carsharing: In many cities, citizens are campaigning for more residential parking spaces. This poses a problem for carsharing users, faced with a decreasing number of usable parking spaces.

Example of bike-sharing: In many cities, Asian bike-sharing providers face fierce resistance because their bicycles are often found obstructing pavements and roads. Many bicycles have been damaged during protests.

Example of cycle lanes: Many cities have seen growing protests against the further expansion of the cycle path network at the expense of parking spaces and road capacity.

Example of self-driving cars: Protests against self-driving car trials are widespread, following a fatal accident with a self-driving Uber car. This could escalate in future.

(10 points – 2 points per case, other examples are possible)

**QUESTION 211 OF 297**

**DLBINGSM01\_Offen\_schwer\_F1/Lektion 02**

1. **Intercity buses have been commonplace in many newly industrializing and developing countries for decades. Why is this not the case in Germany?**
2. **Why is this form of transport so successful in countries like Brazil and South Africa? Discuss four possible reasons, giving consideration to factors such as the role of the state, market regulation, the demand side, and infrastructure requirements.**
3. **This was mainly due to lobbying by the state-owned Deutsche Bahn railway company, which was keen to block competitor products. For many years, policymakers were on its side, and the situation only began to change after endless public debates triggered by complaints from start-ups.**

(Max. 2 points – 1 point per answer)

1. **Many newly industrializing and developing countries lack a comprehensive rail infrastructure and building one would be expensive. Additionally, various geographical features (shifting dunes, subsurface erosion) inhibit the construction of railway lines. Intercity buses are also cheaper than rail travel as a rule – a major consideration in countries where average incomes are comparatively low. Moreover, buses can stop anywhere, allowing small settlements to be connected via request stops.**

(8 points – 2 points per argument, other arguments possible)

**QUESTION 212 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 02**

**List four advantages of cable cars over other modes of transport.**

The advantages are:

* **Short planning times**
* **Minimal space requirements**
* **Low operating costs**
* **Minimal harmful emissions**
* **Low planning costs**
* **Low construction costs.**

(6 points – 1.5 points per answer)

**QUESTION 216 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 02**

**Compare the medium-term success prospects of the hyperloop and air taxis based on expected cost per passenger, capacity, level of development, and regulatory framework.**

Costs: A precise comparison of cost per passenger is difficult, as neither of the ideas are currently market-ready. However, the hyperloop is likely to be cheaper, given the more standardized usage and larger capacity.

(2 points)

Capacity: The hyperloop is the clear winner, both in terms of individual pod capacity and throughput as a whole. There is a finite number of air taxis that can be in the sky.

(2 points)

Development status: Air taxis are marginally ahead. While not yet in standard use anywhere, they are much closer to becoming a reality than the hyperloop.

(2 points)

Regulatory framework: The hyperloop is the winner, as it only requires routings and construction permits, whereas air taxis would require a change in the way airspace is managed, including privacy rules and data protection regulations.

(2 points)

**QUESTION 221 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 03**

**Is the issue of car ownership really relevant to the use of alternative offerings, as claimed by UbiGo’s CEO Arby? Discuss the different costs involved.**

Since the fixed/running costs of car ownership have already been incurred (taxes, insurance, value depreciation), alternative chargeable services, such as public transport, carsharing or taxis, seem comparatively unattractive to car owners.

(3 points)

The variable costs alone make the alternatives a poor choice. Only non-car-owners can usefully compare the alternatives on a total cost basis.

(3 points)

**QUESTION 223 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 03**

1. **What is the role of alternative mobility when deciding to buy your own car?**
2. **Which features of alternative mobility offerings are most relevant in this context?**
	1. **Rather than offering an alternative to their existing car, alternative mobility offerings should be reliable and structured in a way that will induce users to opt out of car ownership.**

(3 points)

* 1. **The main features are:**
		+ **Technological reliability**
		+ **High availability**
		+ **Intuitive use**
		+ **Spatial proximity**
		+ **Convenience**
		+ **Cost-effectiveness.**

(Max. 5 points – 1 point per answer)

**QUESTION 224 OF 297**

**DLBINGSM01\_Offen\_schwer\_F1/Lektion 03**

**Describe a Mobility-as-a-Service concept for a typical German city as comprehensively as you can.**

**Begin with a list of the essential requirements.**

Mobility-as-a-Service describes the ability to purchase different mobility services as bespoke packages from multiple vendors, from a single platform and with a single payment. The platform should also offer an intermodal travel planning service, ideally supplemented by real-time information about the relevant modes of transport.

(Max. 3 points – 0.5 point per answer)

A complete MaaS concept for a large German city would consist of an app or platform that integrates buses, suburban trains and metros, trams, carsharing, bike-sharing, and taxis (as a minimum).

(3 points – 0.5 points per answer)

* **Car- and bike-sharing vehicles can be located, reserved, and booked via GPS.**
* **A live-tracking timetable is available for buses, suburban trains, metros, and trams.**
* **Taxis can be booked and paid for via the app and their journey tracked live via GPS.**
* **Intermodal journey bookings with payment transactions via the app. (4 points – other examples are possible)**

**QUESTION 130 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 03**

**Give four reasons why people should be interested in using alternative mobility services alongside their own cars and conventional public local transport.**

**Based on two of these reasons, explain how their relevance might vary for people in different salary brackets.**

The possible reasons are numerous, and we will accept other relevant options not listed here:

* **Cost savings (ownership, use, parking charges, etc.)**
* **Time savings**
* **Greater flexibility**
* **Less hassle (e.g., breakdowns, tire changes etc.)**
* **Values/convictions**
* **Limited mobility**
* **Greater security**

(Max. 4 points in total – 1 point per answer)

The differences between different income levels could be explained as follows:

The cost-saving aspect is significantly less relevant for people on higher incomes, for whom other factors, such as greater flexibility or environmental friendliness, are probably more important. For people and families with limited incomes, cost is likely to be the decisive argument.

(2 points)

**QUESTION 134 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 03**

**Are the following statements true or false? Outline your reasons in a single sentence for each one.**

1. **“Arranging access to the necessary data for Mobility-as-a-Service is a major issue, due to the need to connect different systems.”**
2. **“Much of the external data that could potentially be incorporated into a Mobility-as-a-Service concept is an interesting add-on but does not really make a difference to the customer.”**
3. **“The use of external data in Mobility-as-a-Service concepts is intended to prevent errors, not just for users but also for the overall control systems.”**
4. **“Mobility-as-a-Service offerings can be both a curse and a blessing for carsharing providers.”**
	1. **True. Free-flowing data between business and data partners (for example, between mobility platforms and the service providers they represent) is often lacking and data sharing is confined to individual mobility service providers offering different segments of a journey or transport route. To complicate matters further, different data formats are used.**
	2. **False. This may apply to individual cases, but in principle the better the information base, the better the decision-making quality.**
	3. **True. If the systems lack data (e. g., about congestion or at-capacity car parks, canceled trains, or insufficient availability of bike-shares), they are bound to make incorrect suggestions.**
	4. **True. While the apps may attract additional customers, transparency about the alternatives can also discourage people from using carsharing.**

(8 points – 2 points per statement – 1 point for true/false, 1 point for justification)

**QUESTION 233 OF 297**

**DLBINGSM01\_Offen\_schwer\_F1/Lektion 03**

**Are the following statements true or false? Outline your reasons in a single sentence for each one.**

1. **“Complexity is a problem that may dissuade people from giving up their cars.”**
2. **“The move to Mobility-as-a-Service solutions will not happen overnight. In recent years and decades, models have been introduced in many cities around the world featuring at least some of the characteristics of the Mobility-as-a-Service definition.”**
3. **“Ultimately, Mobility-as-a-Service solutions are one of the keys to reducing and even eliminating unwanted travel ticket controls.”**
4. **“Real-time information is only relevant to customers until they leave the house and start their journey.”**

**Now briefly comment on the following statement:**

**“Mobility-as-a-Service solutions will become increasingly complex over the next few years and decades, as they integrate more and more different modes of transport. At a certain point, the benefits to users will tail off.”**

1. **True. This is the reason why Mobility-as-a-Service concepts are designed to radically reduce complexity and make it easier to give up car ownership altogether.**
2. **True. This is particularly true of many subscription models.**
3. **True. Smooth transitions between individual modes of transport should help to reduce complexity.**
4. **False. It is still relevant to drivers once they are already on the road, they just have fewer opportunities to react.**

(8 points – 2 points per statement – 1 point for true/false, 1 point for justification)

A growing number of modes of transport need to be integrated. However, the ethos of Mobility-as-a-Service is to minimize complexity. Consequently, as each additional mode of transport is added, the benefits should increase.

(2 points)

**QUESTION 139 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 04**

**Describe four differences between the concepts of carsharing implemented by providers car2go and Greenwheels.**

Possible differences include the following: registration fee, credit check, monthly subscription, utilization period, packages, and charges. Other points not mentioned in the course book, such as the vehicle fleet or the business area, could also be given as answers, provided they are intuitively intelligible. (total 2 points – 0.5 point per answer)

Specific differences:

Registration fee: Applies to car2go/does not apply to Greenwheels.

Credit check: Is a prerequisite for Greenwheels/is not a prerequisite for car2go or is implemented at Greenwheels/is not implemented at car2go.

Monthly subscription: Applies to some contract models at Greenwheels/does not apply to car2go. Utilization period: Flexible at car2go/pre-defined at Greenwheels.

Packages: Minutes for car2go/longer periods (hours, days, weekends, weeks) for Greenwheels.

Drop-off: At the pick-up point for Greenwheels/anywhere (within the business area) for car2go.

Vehicle fleet: Significantly larger at car2go/limited at Greenwheels – only Daimler products at car2go/different brands at Greenwheels – a large proportion of two-seaters at car2go/no two-seaters at Greenwheels.

Business area: Limited area of use for car2go/drivers may leave the area at Greenwheels.

(Total 2 points – 0.5 points per characteristic, but max. 1 point per characteristic)

**QUESTION 141 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 04**

1. **List two pros and cons of the “first-come, first-served” principle in sharing models.**
2. **Name two areas where this principle is applied (even if with minor variations).**

a.

Pros:

* + **Fair and transparent allocation principle**
	+ **No price discrimination**
	+ **Easy to implement**
	+ **Potential problems may be overcome with minor adjustments (15-minute reservation or similar)**

Cons:

* + **Hinders reliable planning**
	+ **May incur unplanned mobility costs when no vehicle is available (e. g., for a taxi)**
	+ **If unsuccessful, users may face other problems (missed train or similar)**
	+ **Might dissuade people from giving up their cars completely (2 points each for each pro, con, and area)**
1. Areas where this principle is applied: carsharing, bike-sharing, scooter sharing

(1 point per answer)

**QUESTION 142 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 04**

1. **How does a merger between carsharing providers affect different customers? Consider a case where someone**
	1. **was not previously a customer of any of the services.**
	2. **was a customer of one of the services.**
	3. **was a customer of both services. Outline one possible advantage and one possible disadvantage in each case.**
2. **What general market-related problems might be associated with a merger between car2go and DriveNow as the two market leaders? Give two possible impacts for customers.**
3. a. **Someone who was not previously a customer of any service no longer has a choice between two different providers and their services (fewer choices). One potential upside would be if the combined service is superior to the services previously provided by the individual companies.**

b. A previous customer of one of the services will have the advantage of access to a larger fleet of vehicles after the merger. However, they may have consciously decided against one of the companies but will then become their customer. In the long term, the merger could also lead to price increases and a reduced vehicle fleet.

c. A previous customer of both services would have the advantage that two memberships and, where applicable, two monthly subscriptions are no longer required. One potential disadvantage is a reduced number of options available once fares and vehicle fleets are adjusted.

(2 points for each of a, b, and c in total – 1 point per advantage/disadvantage)

1. **Generally speaking, a merger between the two market leaders could lead to an unhealthy concentration of market power and a monopoly (or monopoly-like oligopoly). For customers, such developments are likely to mean higher prices, less choice, less innovation, and inferior quality of service.**

(Total 2 points – 1 point for mentioning the problem of market power/monopoly/oligopoly, 0.5 points each for indicating the two possible effects on customers)

**QUESTION 143 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 04**

**What options are available for vehicle allocation sharing models other than the “first come, first served” principle? Why are these important? Please consider variations on this principle as well as entirely different approaches. Refer to models you are already familiar with and give examples.**

Most mobility sharing providers offer the option of reserving shortly beforehand, to avoid a wasted walk to the car.

(2 points)

car2go allows you to reserve 20 minutes in advance for free, while at DriveNow it is 15 minutes. DriveNow also offers the possibility of reserving a car up to eight hours in advance, subject to payment of a fee.

(3 points)

Other than these solutions, however, there are few opportunities for users to boost their chances of accessing the limited pool of cars and bikes available. Other conceivable allocation methods might include the auction-based mechanisms used by some taxi app providers like myTaxi or Uber.

(3 points)

**QUESTION 147 OF 297**

**DLBINGSM01\_Offen\_mittel\_F1/Lektion 04**

**What factors might have persuaded car manufacturers like Daimler or BMW to enter the carsharing market?**

**Name two key strategic approaches to market entry, giving reasons.**

It was probably a combination of factors. The growing carsharing market is attractive to companies, especially those already present in the mobility industry. There is also a risk that carsharing will limit the number of people interested in car ownership, which could become an issue for car manufacturers.

(2 points)

The carsharing market will develop with or without their intervention, so it is better for companies to be part of it and help actively structure the alternative solutions to car ownership, rather than sit by and watch it happen at their own expense. Moreover, it offers an opportunity to use their own vehicles as the basis for mobility services and generate customer data.

(3 points)

For those who view carsharing as complementary to car ownership, carsharing models are also a form of marketing. Effectively, car manufacturers could see them all as potential customers who are continuously paying for test drives. The cars also supply data on usage and mobility behavior, which in turn can be used to develop cars and services.

(3 points)

**QUESTION 149 OF 297**

**DLBINGSM01\_Offen\_schwer\_F1/Lektion 04**

**Picture the scenario: You are 30 years old, single, childless, and living in Berlin. You do not own a car and mainly use public transport. Your parents live half an hour outside of Berlin and you try to visit them every Sunday for a couple of hours for tea and cake. The small town where they live is not accessible by public transport, so you want to use a carsharing service.**

1. **What are the distinguishing criteria between different carsharing service providers? List five.**
2. **Which are the three most relevant criteria for selecting a provider in your particular case? Give a brief explanation of your choice.**
3. **Which of the three well-known carsharing providers would you choose?**
4. **Key decision-making criteria may include the following (others are also possible):**
	* **Registration fee (yes/no/amount)**
	* **Credit check (yes/no)**
	* **Monthly fee (yes/no/amount)**
	* **Utilization period (flexible/pre-determined)**
	* **Packages (yes/no)**
	* **Drop-off (at pick-up location/anywhere)**
	* **Choice of vehicle**
	* **Operating area**

(Max. 5 points – 1 point per answer)

1. **In this scenario, the following criteria are particularly important:**
	* **Operating area – You must be allowed to leave the operating area to visit your parents outside the city.**
	* **Utilization period – You can plan your trips well in advance, but guaranteed availability is important.**
	* **Monthly subscription – A monthly fee would make membership very expensive for occasional use.**

(3 points)

1. **You will probably choose DriveNow (or Greenwheels), because unlike car2go, it offers longer-term planning and reservation, and there is no basic fee.**

(2 points)

**QUESTION 152 OF 297**

**DLBINGSM01\_Offen\_schwer\_F1/Lektion 04**

**Picture the scenario: You live on the outskirts of a major German city that has expanded massively in recent years. Your financial situation has recently improved, so you are thinking about buying a car to drive to work. You would save an average of 22 minutes per day on 20 working days per month. Your preferred car would cost you € 320 a month, you would cancel your public transport season ticket at € 85 a month and you would save taxi costs of € 50 a month. You have set yourself a limit: If the time savings cost you more than € 20 per hour, you will not buy a car even though it is more convenient.**

1. **What is your final decision?**
2. **What are the conceivable alternatives? Name two.**
3. **First calculate the saved travel time in minutes: 22 minutes \* 20 days = 440 minutes**

This equates to 440 minutes / 60 minutes = 7.3333 hours (3 points in total – 1.5 points per calculation step)

Then calculate the general additional costs:

€ 320 + € 85 + € 50 = € 185

The cost per hour of saved travel time is calculated as follows:

€ 185 / 7.33333 hours = € 25.23

(3 points in total – 1.5 point per answer)

The cost per hour is € 25.23 and therefore above your self-imposed limit of € 20. So you decide not to buy a car.

(2 points – 1 point for the correct comparison, one point for the correct decision)

1. **Alternatives might include: a cheaper car, carpooling/sharing with colleagues in the neighborhood, cycling to work, carsharing. This is not an exhaustive list; creative answers are possible.**

(2 points)

**QUESTION 154 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 05**

**A growing number of players are developing alternatives to the American GPS navigation system.**

**Name three countries or regions doing so and explain their motivation. Briefly describe why positioning will become an even more relevant topic in the next few years.**

Players currently working on alternatives to GPS include:

* **India**
* **China**
* **Russia**
* **EU**

(Max. 3 points – 1 point per answer)

GPS was developed by the American Defense Department and these players are keen to eliminate their reliance on it in the long term.

(1 point)

Many mobility services (car- and bike-sharing) depend on precise positioning. Moreover, very accurate and reliable positioning are essential for self-driving cars, which look set to become a reality in the foreseeable future.

(2 points)

**QUESTION 156 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 05**

***“If the mountain will not come to Mohammed, Mohammed must go to the mountain.”***

**Explain the goals of efficient traffic management and the technical approaches for achieving this.**

Attempts have previously been made to adapt the red and green phases of the traffic lights to the current traffic situation to facilitate precise traffic control. This is known as the “Green Wave”.

(2 points)

The trials were not particularly successful, so there has been a rethink of the approach. The new idea is to manipulate vehicle behavior to allow them to pass critical junctions without stopping.

(2 points)

One option would be to install dynamic speed indicators at the roadside, setting the precise speed that would maximize time and fuel savings in conjunction with other road users. Alternatively, planners could rely on a growing number of cars being equipped with onboard computers to relay the current recommended or mandatory speed onto their displays.

(2 points)

**QUESTION 157 OF 297**

**DLBINGSM01\_Offen\_schwer\_F2/Lektion 05**

**At present, information about the current traffic situation is usually recorded at specific intervals and points.**

1. **Which two methods are frequently used to do this?**
2. **What are the problems with this type of measurement?**
3. **Which technological developments could make real-time traffic control possible?**
	1. **Stationary detection systems and helicopter overflights are the main methods currently used. (2 points)**
	2. **The weakness of this approach is obvious: Measurements are only accurate at the precise moment and location where they are carried out. A disruption occurring just moments later or between two measuring points will not be detected at all, or not until later, by which time the disruption would have already reached the next measuring point. This is irritating for people who could have avoided the site of the incident had they been notified earlier (ideally in real time). In the worst case, it could even result in their involvement in an avoidable accident, with all the associated dangers.**

(Max. 5 points – 1 point per answer)

* 1. **Advances in telematics (GPS positioning) coupled with a widespread availability of data networks – including WLAN, Bluetooth, and mobile telephony – have paved the way for solutions that would have been unimaginable ten years earlier. In the not-too-distant future, almost every new car that rolls off the production line will be equipped with the technology to transmit Floating Car Data (FCD) -->**

Addendum: See statutory regulations on eCall with effect from 2018.

* 1. **This vehicle-generated data enables journey tracking of individual vehicles. Once most or all vehicles are fitted with FCD transmitters, it will be possible to make reliable, quantified statements on traffic conditions in real time.**

(Max. 3 points – 1 point per answer, alternatively include FCO)

**QUESTION 161 OF 297**

**DLBINGSM01\_Offen\_mittel\_F2/Lektion 05**

**Are the following statements true or false? Outline your reasons in a single sentence for each one.**

1. **“Galileo is the response to Russia’s escalating aggression and the GLONASS system used there.”**
2. **“The latest generation of satellite-based navigation systems, be it the American GPS or the European Galileo, will enable long-awaited indoor navigation.”**
3. **“Satellite-based navigation systems alone do not provide an adequate infrastructure for a powerful, smooth-running smart mobility environment.”**
4. **“Satellite-based navigation systems use the triangulation method. Three satellites determine longitude, latitude, and altitude, allowing very precise localization of the transmitter.”**
5. **False. Galileo and Glonass are responses to the heavy reliance on the American Global Positioning System (GPS).**
6. **False. No satellite-based system enables fault-free indoor navigation.**
7. **True. A comprehensive smart mobility environment requires interconnection between satellite-based systems, terrestrial and mobile positioning.**
8. **True. Virtually all positioning systems use the triangulation principle, including satellite-based systems.**

(8 points – 2 points per statement – 1 point for true/false, 1 point for justification)

**QUESTION 162 OF 297**

**DLBINGSM01\_Offen\_mittel\_F2/Lektion 05**

**Are the following statements true or false? Outline your reasons in a single sentence for each one.**

1. **“The idea of controlling traffic flow via the intelligent manipulation of traffic lights only arose within the context of smart mobility.”**
2. **“Traffic planners want to use traffic lights to create a bunch of vehicles that passes through the maximum number of nodal points on the route, ideally without braking or accelerating.”**
3. **“Attempts to adapt the traffic lights to traffic flow have since been abandoned. Now the emphasis is on manipulating traffic flow using the traffic lights.”**
4. **“In Bellevue in the United States, a transport system that adapts in real time to the traffic situation has helped to cut journey times during peak hours.”**
5. **False. This approach (“Green Wave”) has been around for decades.**
6. **True. This is the theory behind the “Green Wave” principle, which has unfortunately been hindered by practical obstacles.**
7. **True. The approach is based on the saying “If the mountain cannot come to Mohammed, Mohammed must go to the mountain” and uses the state-of-the-art features built into the latest generation of vehicles.**
8. **True. In Bellevue, journey times at peak periods have been reduced by 40%, saving drivers millions of dollars.**

(8 points – 2 points per statement – 1 point for true/false, 1 point for justification)

**QUESTION 164 OF 297**

**DLBINGSM01\_Offen\_schwer\_F2/Lektion 05**

**Only one of the following statements is true. Which is it? Give a brief justification of your decision for the false statements.**

1. **“In the past, information about the current traffic situation was continuously recorded, but only in specific locations, e.g., by stationary detection systems or helicopter overflights.”**
2. **“The weakness of this approach is obvious. Measurements are only accurate at the precise moment and location where they are carried out. A disruption occurring just moments later or between two measuring points will not be detected at all, or not until later, by which time the problems have already reached the next curve.”**
3. **“This is irritating for people who could have avoided the site of the incident had they been notified earlier (ideally in real time). In the worst case, it could even result in their involvement in a fatal accident.”**
4. **“Advances in telematics (GPS positioning) coupled with near-comprehensive availability of WLAN have paved the way for solutions that could never have succeeded ten years ago. In the not-too-distant future, almost every new car that rolls off the production line will be equipped with the technology to transmit Floating Car Data (FCD).”**

**Based on the above statements, please answer the following question:**

**What would be the alternative to the FCO system, which is based on FCD? Explain what the abbreviation “FCO” stands for.**

Only answer c is correct. (2 points)

1. **Is incorrect because the information is only recorded at specific times.**
2. **Is incorrect because problems are not detected at the next curve but at the next measurement point.**

d. Is incorrect because it is not about comprehensive availability of WLAN, but of data networks in general.

(6 points – 2 points per statement – 1 point for true/false, 1 point for justification)

“FCO” stands for “Floating Car Observer”. If all cars were fitted with FCD systems, this addition would not be necessary.

(2 points)

**QUESTION 266 OF 297**

**DLBINGSM01\_Offen\_mittel\_F2/Lektion 06**

1. **Give three examples of passive safety systems that are now found in most cars.**
2. **Identify the item that you personally feel has made the greatest contribution to transport safety and explain why. Compare this with the development of active safety systems in recent years and comment on the following statement: “The major inventions in passive safety systems have had a greater impact than the expensive developments in active safety systems could ever achieve.”**
3. **Possible answers on passive safety systems: Safety belt**

Anti-lock braking system (ABS)

Passenger compartment

Crumple zone

Airbag

(Max. 3 points – 1 point per answer)

1. **There is no right or wrong answer regarding their personal choice, as long as they give a plausible justification. For example, they might say:**

I believe the development of the airbag represents the greatest contribution, because with cars travelling at ever-faster speeds, it has helped to significantly reduce the number of accidents resulting in serious injuries or death. Although there have been other crucial developments, these would have been relevant even in slower-traveling vehicles. The airbag is one of the most important inventions for today’s mobile society.

(Max. 2 points – 1 point for each clear argument)

The opinion should elucidate three aspects:

The early inventions (passive safety systems) had a far greater impact because they were essentially starting from zero. A safety belt helps prevent people from being thrown out of the car whether it is traveling at 30 km/h or 180 km/h.

(1 point)

More recent safety systems built on these early systems and optimized their impact.

(1 point)

However, in percentage terms, active safety systems have also been very successful. It is important to consider the relative figures as well as the absolute figures. (1 point)

**QUESTION 268 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 06**

**The German Ministry of Transport and Infrastructure (BMVI) hopes to apply the Car2X technology to other areas in future.**

**Which area is already benefiting from a six-figure funding package? What is its technical name? Which four specific benefits are already being explored?**

An application for the rail sector is already receiving more than € 3 million in funding. Its name is Rail2X.

(2 points)

The following benefits are being discussed:

* **More efficient track maintenance**
* **Enhanced passenger convenience with request stops**
* **Greater traffic safety at rail crossings**
	1. **by warning the locomotive driver**
	2. **by warning car drivers**

**(4 points – 1 point per answer)**

**QUESTION 269 OF 297**

**DLBINGSM01\_Offen\_mittel\_F2/Lektion 06**

1. **What does the abbreviation “C2C-CC” stand for?**
2. **Which three groups collaborate in this organization?**
3. **What is the purpose of the organization? Why is it important for the standards within its sphere of influence to have an adequate range?**
4. **“C2C-CC” stands for “CAR 2 CAR Communication Consortium”. (1 point)**
5. **C2C-CC brings together various European research institutions, car manufacturers and suppliers. (3 points – 1 point per answer)**
6. **The organization is developing standards for data exchange within the context of Car2X systems (2 points). This groundwork is essential to the realization of many smart mobility visions (2 points).**

**QUESTION 175 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 06**

**Are the following statements true or false? Outline your reasons in a single sentence for each one.**

1. **“Schloss Bellevue, the German President’s official residence in Berlin, has already implemented a smart parking solution.”**
2. **“The best-known smart parking solution adapts prices in line with demand in real time.”**
3. **“Digital transparency about parking costs in California means you always have the correct change for the parking meter.”**
4. **False. Schloss Bellevue does not have anything of the kind. However, a smart parking solution does exist in California, for example.**
5. **True. This is used to control the traffic.**
6. **False. Payment is made via the app. No coins are needed.**

(6 points – 2 points per statement – 1 point for true/false, 1 point for justification)

**QUESTION 178 OF 297**

**DLBINGSM01\_Offen\_schwer\_F2/Lektion 06**

**Describe the optimum conditions for a smart mobility environment. Which layers need to interact? Which players need to communicate with one another? Which technologies and networks are used?**

The optimum environment for smart mobility is comprised of interconnected satellite-based, terrestrial and mobile positioning systems.

(3 points)

Within this environment, communications channels between vehicles (Car2Car or Vehicle2Vehicle), between vehicles and infrastructure (Car2Infrastructure or

Vehicle2Infrastructure), between vehicles and people (Car2Portable or Vehicle2Portable) and between different infrastructures (Infrastructure2Infrastructure) are also needed.

(4 points)

Technologies like Bluetooth, WLAN, radio, mobile communications, GPS, Galileo etc. are used.

(Max. 3 points – 1 point per answer)

**QUESTION 179 OF 297**

**DLBINGSM01\_Offen\_schwer\_F2/Lektion 06**

**What does the March 2018 fatality in Arizona, USA, tell us about the problems with self-driving vehicles? Which company was involved? What challenges can we expect over the next few years? What issues must be addressed and resolved? Give three examples.**

While human error had previously been to blame for around 90% of accidents involving self-driving vehicles, none of which were fatal, in the case of the Uber test car in Arizona, the software had apparently mistaken a woman pushing her bicycle for a plastic bag. These types of image‑recognition errors are undoubtedly a barrier to fully self-driving vehicles, especially in large cities with their complex surroundings.

(4 points)

After years of extensive reporting on the breath-taking technological advances made, the accident in Arizona unleashed a storm of controversy that looks set to continue over the next few years. The issue of liability in such cases (who is liable – the car owner, driver, passenger, or manufacturer?) will need to be clarified and defined in law. The possibility of cars being hacked and used as weapons must also be addressed. The criteria used by algorithms to make decisions in difficult situations (“Do I knock down the child or collide with the other car?”) is likewise a highly controversial topic.

(2 points per answer)

**QUESTION 281 OF 297**

**DLBINGSM01\_Offen\_schwer\_F2/Lektion 07**

**Which four main factors caused the UbiGo project in Gothenburg to fail? Explain how each of these errors could have been avoided.**

The four factors were a lack of funding, unresolved legal issues, uncertainty about the private partners’ business models, and weaknesses in communication.

(4 points – 1 point per answer)

Funding problems: The project participants should have budgeted for the cost of scaling-up from the outset, even if these funds were not ultimately needed.

Legal framework conditions: Before launching the trial phase, the project participants should have considered what happened in Stuttgart with SSB Flex, for example, and devised suitable solutions. The legal situation should always be clarified before beginning a trial that is designed to be extended.

Business models: The project participants should have asked the private partners about their concerns and requirements earlier on, so that joint solutions could be found. If their concerns are not known, they cannot be addressed.

Communication: It is not always appropriate to describe something as a “project” if the ultimate aim is to establish it as a permanent feature, because people will assume there is an end date and will not incorporate the service into their future plans. A shared understanding of the prospects is crucial for devising joint long-term strategies.

(6 points – 1.5 points per suggestion)

**QUESTION 285 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 07**

**Name six different modes of transport that can be interconnected in a Mobility-as-a-Service solution.**

**Give real-life examples.**

Possible modes of transport include:

* **Buses**
* **Metros and regional railways**
* **Trams**
* **Carsharing**
* **Bike-sharing**
* **Rental cars**
* **Taxis**
* **Rail**
* **Ferries**
* **Minibuses**
* **Aircraft**
* **Freight logistics.**

(Max. 6 points – 1 point per answer)

**QUESTION 286 OF 297**

**DLBINGSM01\_Offen\_leicht\_F1/Lektion 07**

**Discuss how relevant the following modes of transport are to the acceptance and success of a Mobility-as-a-Service solution. Rank them in order, giving a brief explanation for each one.**

1. **Local public transport**
2. **Bike-sharing**
3. **Rental cars**
4. **Aircraft**

The correct sequence is:

* 1. **Local public transport – Because combined with individual transport, it carries the majority of passengers.**
	2. **Bike-sharing – Because this mode of transport is quite common, and in inner cities it is a reasonably quick way to reach your destination.**
	3. **Rental cars – Even frequent users tend to use rental cars less often and less regularly than public transport or bicycles. They are also far more expensive.**
	4. **Aircraft are a special case in a Mobility-as-a-Service app, only relevant for a small group of people.**

(2 points for the correct sequence, 4 points for the reasons – 1 point for each mode of transport)

**QUESTION 190 OF 297**

**DLBINGSM01\_Offen\_mittel\_F2/Lektion 07**

**The SSB Flex fleet has only ten vehicles.**

1. **How could this number be considered adequate in a large city like Stuttgart? Justify your answer using based on the objectives and business model of SSB Flex.**
2. **Based on your answer, consider whether similar models should be located in city centers or in the suburbs/in the country in future, and why.**
3. **During which day and night periods and on which days of the week is demand likely to be greatest? Differentiate between weekdays and weekends.**
4. **Which are likely to be the biggest customer groups?**
5. **SSB Flex is primarily intended to fill the gap between public local transport and taxis. It is not a replacement for public transport or taxis and therefore need not operate on the same scale; it is a niche product and therefore sufficient for a city.**

(2 points)

1. **These types of models are less attractive for city centers, where there is a dense network of public transport, car- and bike-sharing available, even at night. Consequently, these types of models are more attractive for the suburbs and for rural regions.**

(2 points)

1. **Demand is likely to peak during office hours in the daytime, and at night on the weekend.**

(2 points)

1. **The key target groups are people with limited mobility (the elderly and young people without a driving license, etc.) and people who want to go out but do not want to drink and drive or spend the money on a taxi.**

(2 points)

**QUESTION 192 OF 297**

**DLBINGSM01\_Offen\_mittel\_F2/Lektion 07**

**Are the following statements true or false? Outline your reasons in a single sentence for each one.**

1. **“Mobility-as-a-Service and smart mobility are competing concepts.”**
2. **“UbiGo is not a Mobility-as-a-Service project in the true sense of the word because customer service was provided by telephone, rather than digitally.”**
3. **“Projects like UbiGo in Sweden or the SSB projects in Germany are well-meaning but fail to address the real challenges. Smart mobility is primarily relevant for the megacities of developing and newly industrializing countries, which have very different requirements.”**
4. **“Public acceptance of smart mobility projects can only be achieved with free trials. No-one would be willing to pay money for a trial phase.”**
5. **False. Mobility-as-a-Service is an element/example of smart mobility.**
6. **False. Mobility-as-a-Service describes the ability to purchase different mobility services as custom packages across multiple vendors, from a single platform and with a single payment. How the customer service is organized is irrelevant.**
7. **False. Smart mobility is relevant throughout the world, just with different focal points.**
8. **False. During the trial phase of the UbiGo project in Gothenburg, the service was not provided for free but it was still well-received.**

(8 points – 2 points per statement – 1 point for true/false, 1 point for justification)

**QUESTION 194 OF 297**

**DLBINGSM01\_Offen\_schwer\_F2/Lektion 07**

 **A press release on the launch of UbiGo in Stockholm in 2018 read:**

**“We have developed a powerful, scalable mobility platform that will allow our mobility provider UbiGo to focus on offering a good range of services to app users and at the same time add value for transport service providers. [...] Each household can select a flexible monthly subscription that can be accessed by all family members via the same account. They can top up their credit and carry it forward to the next month via the app.”**

1. **This text contains references to mistakes that were made in the pilot project in in Gothenburg. Name them and give a brief description.**
2. **Also explain what other problems evidently need to be solved before operation in Gothenburg can continue.**
3. **What could be further improved? Consider a project in Stuttgart you are familiar with and make references to it.**
4. **Discuss why a country like Sweden, particularly the cities of Gothenburg and Stockholm, is ideal for smart mobility projects.**
5. **The reference to a “powerful and scalable app” indicates that progress has been made since the trial in Gothenburg when the app was not yet scalable. The reference to “adding value for transport service providers” was likewise an issue in Gothenburg but has since been resolved. This applied, for example, to taxi companies. (2 points – 1 point per mention)**
6. **In Gothenburg, additionally, some funding issues remained unresolved and some of the legal framework conditions were unclear. Additionally, there were some weaknesses in communication. (3 points – 1 point per mention)**
7. **In the Stuttgart SSB BestPreis project, the best tickets for the customer are calculated at the end of each month. With UbiGo, customers put together their own packages. This is an area that could be improved. (2 points).**
8. **Sweden is a country with a highly developed infrastructure and the financial and technological resources needed to implement high-tech projects. Moreover, there is a high standard of education and the majority of people own a smartphone that is permanently connected to the Internet. This is a prerequisite for the implementation of many smart mobility projects. Countries like Sweden also have a high level of openness to environmentally motivated changes. Moreover, the cities face traffic and emissions problems that will need to be resolved during the next few years. These are all factors that support the implementation of smart mobility projects.**

(Max. 3 points – 1 point per mention. Other good arguments are also conceivable)