

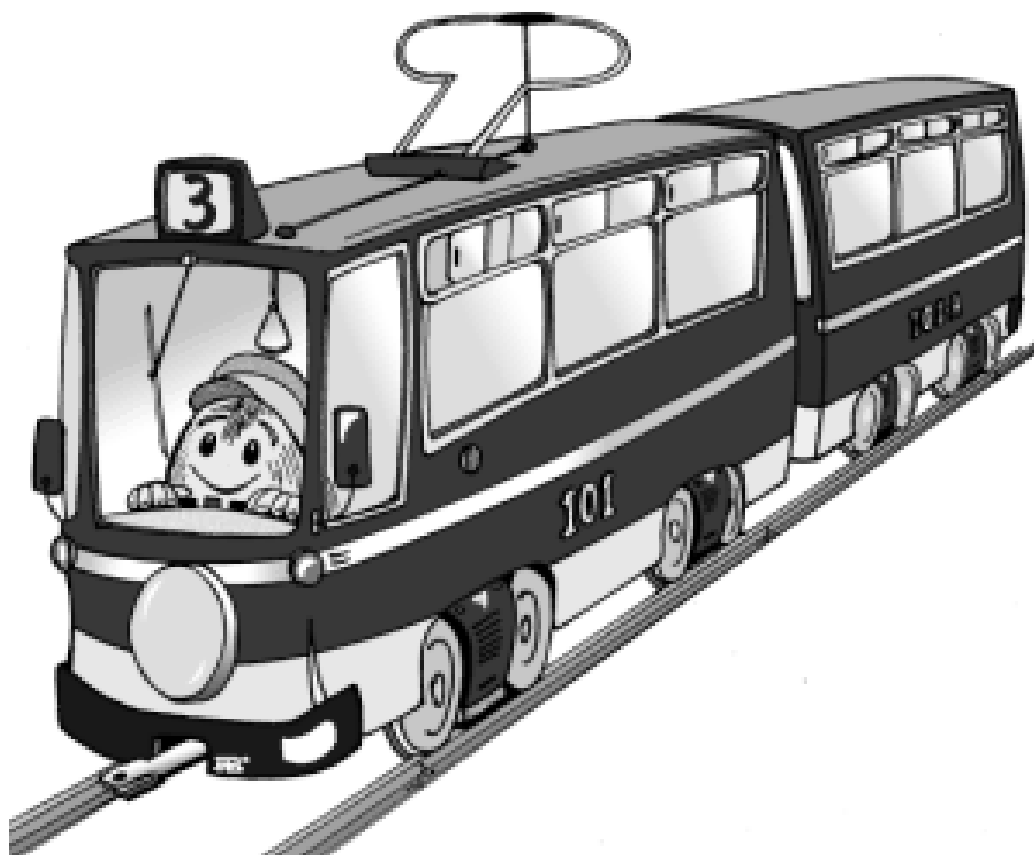
МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

ХАРКІВСЬКА НАЦІОНАЛЬНА АКАДЕМІЯ МІСЬКОГО ГОСПОДАРСТВА

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MEANS OF TRANSPORTATION

Збірник текстів і завдань з дисципліни
'Іноземна мова (за професійним спрямуванням) (англійська мова)'
(для організації самостійної роботи
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INTRODUCTION

This course is for the students studying English for scientific and technical purpose (ESP). The course is designed to familiarize the students for non-language higher education institutions with the information on municipal electrical transport in particular.

This course consists of the fifteen units. These are:

Unit Eight. Cars in UK and UA.

Unit Nine. Trams in UK and UA.

Unit Ten. Trolleybuses.

Unit Eleven. Trains.

Unit Twelve. Underground.

Most of the units provide the learner of English with authentic texts from different sources concerning specifically the municipal electrical transport problems and focus on the area of vocabulary that is useful for the students studying the municipal electrical transport.

UNIT EIGHT. CARS IN UNITED KINGDOM AND IN UKRAINE

Text 1. London Taxi

Traditional London Taxis are of a distinctive design and are generally, but not always, black. Taxi drivers are licensed and have extensive knowledge of streets and locations. You can hail a taxi on the street by attracting the attention of the driver or take one from a taxi rank, often found at train and bus stations and in town centre locations. Fares can be expensive unless sharing between a group of friends and are based on a minimum fare, distance covered, time taken and time of journey. Drivers should be able to give you an estimate of the cost of the journey but fares will be metered unless a special arrangement is made with the driver.

A mini cab differs from a Taxi in that it is a private hire vehicle that must be booked in advance either by phone or in person at a mini cab office. This means that you should not be able to hail one from the street and they cannot wait in a taxi rank. Drivers will not necessarily be well trained and may not speak English very well. For safety reasons you should not get into a mini cab that you have not ordered yourself especially late at night when travelling alone. Fares are generally not metered and you are strongly advised to negotiate a fare prior to making the journey as many drivers make up a price that they think they can get away with.

In the United Kingdom, a hackney carriage is a taxicab licensed by the Public Carriage Office in the London Metropolitan Area or by the local authority in other parts of the country.

They were originally Hansom cabs, horse-drawn carriages that operated as vehicles for hire. Today a hackney carriage is a taxicab that is allowed to ply the streets looking for passengers to pick up, as opposed to private hire vehicles sometimes called minicabs, which may only pick up passengers who have previously booked or who visit the taxi operator's office.

At the beginning of 2004, the government is currently consulting local councils and taxi operators on abolishing the distinction between the two types of taxi, with a view to issuing only hackney licences.

In most of the country hackney carriages are conventional four door saloon cars but in London (and some other cities) hackney carriages are specially designed vehicles manufactured by Manganese Bronze. These vehicles are designed to take up to 6 passengers in the back, and hold luggage in the front next to the driver. Some modern designs can also accommodate wheelchairs in the back.

They were traditionally all black in colour and are popularly known as black cabs. Despite the name, other colours can be observed – most frequently when large groups of cabs are resprayed in vivid brand liveries as part of advertisement campaigns.

In London, Hackney Carriage drivers have to pass a test called The Knowledge to demonstrate they have an intimate knowledge of London streets.

The first Hackney Carriages were licensed in 1662, and were at the time literally horse-drawn carriages. During the 20th century these were generally replaced with cars, and the last horse-drawn Hackney carriage was withdrawn from service in 1947.

The name derives not from Hackney in London, but from the French word, referring to the horse that was pulling it. The New York terms ‘hackstand’ (taxi stand) and ‘hack license’ (taxi license) likely derive from ‘hackney carriage.’

1. Read the statements and find out if they are true (T) or false (F).

1. London Taxis differ in colours and design. ()
2. London Taxi, minicab and Hackney cab are not licensed. ()
3. The first Hackey Carriages were horse-drawn. ()
4. Hackey Carriage is a black cab. ()
5. London Taxi and Hackey Carriage get the same license form the government. ()

2. Match the words from the text with the corresponding definitions.

- | | |
|---------------------|--|
| 1. cab | A. a carriage pulled by a horse, used in the past like a taxi |
| 2. hack license | B. is the group of people responsible for the government of a particular area, town, or city in the UK |
| 3. hack stand | C. a car and driver that you pay to take you somewhere |
| 4. hackney carriage | D. a place where taxis wait for customers |
| 5. local authority | E. an official document giving you permission to own or do something for a period of time |

3. Put the following word combinations in the text below.

advertising campaigns	hackney cabs	modern designs
hackney carriage operators	passenger seat	black cabs

In most of the UK (1) _____ use conventional four – door saloon cars, but London use specially – designed hackney carriages manufactured by a small number of companies. These vehicles allow up to 5 passengers in the back. Luggage is usually carried in the passenger compartment, but may be carried in the front next to the driver – there is no front (2) _____, although a door has replaced the original open side. Some (3) _____ can also accommodate wheelchairs in the back. (4) _____ have a turning circle of only 25 feet.

Motorised (5) _____, traditionally all black in colour, have the popular name of black cabs, although other colours are used, most frequently when (6) _____ call for the respraying of large groups of cabs in vivid brand liveries, as in this example of an ‘ad campaign’.

Text 2. Travelling by Taxi in Ukraine

There are two categories of taxis in Ukraine – official taxis who work for taxi services and have lights or signs on the top of the car, and private drivers who drive around town and pick up passengers.

Cars from taxi services can be ordered over the phone, or they can be picked up on streets next to bus stops and busy locations. If people order taxi by phone, they need to give their current address, the address of their destination, last name, and the time of trip. Sometimes dispatchers will ask for a contact number. Usually they will not agree to send a taxi to someone standing outside, because there is too much risk the customer will ride away on another car. The average time it takes to send a taxi to the current address is 12 – 15 minutes, so there is no need to order a taxi more than an hour in advance. However, during rush hour sometimes no cars are available at all. In this case, it will be easier to catch a car on the road.

Most taxi services will tell people the price over the phone based on the distance if they ask, but the price may rise if people get stuck in traffic. Each taxi service has its own calculation system, and most cars are equipped with meters. Most meters measure time as well as distance, so they will end up paying more if they get stuck in traffic. Wherever possible, it is best to settle on a price beforehand. The minimum cost of a taxi ride is 15 – 20 UAH.

In addition to sedans, most taxi services offer station wagons with more baggage space and even minivans. The prices for these automobiles are slightly higher.

In Ukraine any car is a potential taxi. People just stick their hand out to catch a car, then agree on a price with the driver if he (more rarely she) is willing to take them where they want to go. This is a very common practice and is not considered at all dangerous.

In general private drivers are less expensive than taxis, but if passenger is a foreigner and speak with an accent, it will be harder to get a low price.

1. Answer the following questions.

1. What types of taxis are there in Ukraine?
2. Why is any car in Ukraine a potential taxi?
3. How can people hire taxi in Ukraine?
4. What information should people give the dispatcher if they order taxi by phone?
5. How much does it cost to travel by taxi in Ukraine?

2. Find words in the text that mean the same or are similar to the following.

1. someone who is travelling in a vehicle, plane, boat etc, but is not driving it or working on it

2. the place that someone or something is going to

3. a visit to a place that involves a journey, for pleasure or a particular purpose

4. someone whose job is to send out vehicles such as taxis to places where they are needed

5. impossible or unable to move from a particular position

6. a machine that measures and shows the amount of something you have used or the amount of money that you must pay

7. before something else happens or is done

3. Complete this extract from the text, replacing the missing prepositions.

at (x2)	in (x2)	by (x3)	on
---------	---------	---------	----

Taxis can be found around major cities (1) _____ taxi stands, or you may hail them (2) _____ the street (3) _____ raising an arm above the head. You can also order a taxi (4) _____ calling on the phone. The yellow pages of the phone book list 'taxis'. Passengers always sit (5) _____ the backseat of the cab and the fare is paid (6) _____ the end of the trip. Taxi fare is determined (7) _____ a meter placed next to the driver, (8) _____ the dashboard of the taxi. Usually the fare depends on the distance.

UNIT NINE. TRAMS IN UK AND UA

Text 3. What Is Tram?

Trams and light rail are forms of urban public transport; with a handful of exceptions, tramways and light rail systems across the world are almost exclusively passenger-carrying operations. There is no hard and fast definition of what constitutes 'Light Rail' or what the difference is between light rail and trams, and there are different opinions on what exactly the terms mean, but this page should give you an idea.

Part 1

A tram, usually known in North America as a 'streetcar', 'trolley' or 'trolley', is a vehicle which runs on fixed rails and is designed to travel on streets, sharing road space with other traffic and pedestrians. Most tram systems also include at least some off-street running, either along the central reservation of roads (what would be called the 'median strip' in the US) or on fully segregated alignments. Such section of route can be called 'reserved rights of way'. Some tram systems run mostly on reserved tracks, with only short stretches of on-street running. Many of the tram systems in the UK utilise former railway alignments, or share what were previously railway-only alignments with heavy rail services. The tracks that a tram runs on are called a tramway; the system itself can be called a tramway system.

Part 2

Horse-drawn tramways were first introduced at the beginning of the 19th Century. The first electric tramway began operation in Germany in 1881, and existing

horse-drawn tramways were progressively converted to electric operation. With the emergence of motorbuses and trolleybuses (also known as trackless trolleys) which run on rubber tyres without needing rails, tramways started to fall out of favour. In many countries (the UK and the US for example), many tram systems were abandoned in favour of these alternative forms of mass transit; the rising popularity of private cars also had a detrimental effect on the viability of tramways. In Britain, by the end of 1962 all but one tramway system (Blackpool) had closed. In North America, all but a tiny handful of tramways had closed by the mid 1960s. Many systems remained open in continental Europe, and have been progressively modernised.

Part 3

The term 'light rail' is used to describe railway operations using smaller vehicles which have a lower capacity and lower speed than conventional railways; light rail infrastructure is designed to be cheaper to build and maintain. Light rail is an intermediate transport mode, catering for short intra- and inter-urban journeys – stops are generally closer together than commuter railways but further apart than local bus routes. Because of the nature of the technology used, light rail systems are often subject to less stringent operational regulation than conventional railways, which leads to greater operational flexibility. For instance, 'heavy rail' systems will normally be required to operate block signalling systems which create an absolute limit on track capacity – maximum headway. By contrast many light rail systems, by virtue of their slower speeds, lighter vehicle construction and shorter braking distances, are able to operate on line-of-sight, allowing vehicles to pull up right behind one another, meaning there is virtually no limit to track capacity. Light rail systems typically feature high-frequency services, removing the need for anything more than the most basic public timetables. Stops are often less substantial than conventional railway stations, and are generally unstaffed; they can range from converted former railway stations to little more than a bus stop. A common feature of many light rail systems, particularly those which feature street running, is that they are more integrated into the urban environment than conventional railways. In particular, stops can be designed to be a part of the communities they serve rather than being physically separated from them. This design approach impacts on public awareness and passenger perception and can make people more likely to consider travelling on them. Light rail systems almost universally feature electric power, although there are a very small number of diesel light rail vehicles. Tram-train, a modern concept which has been trialled in Germany, features hybrid vehicles which travel into a city on main line railway tracks, under diesel power if necessary, before switching to tram tracks and electric power for the journey through the city centre.

Part 4

Light rail is a relatively modern term, and can be applied to quite a broad spectrum of systems. Virtually every tram systems can be considered as light rail, but only those light rail systems which feature street running can be called trams. It could be said that as light rail is a modern term, only modern systems could be called light rail; however, older tramways still incorporate many of the features of modern light

rail systems, and many have also been progressively modernised so that they are very similar to more recently constructed systems.

Part 5

Some light rail systems are referred to as ‘Metros’. ‘Metro’ is a term which can be used to describe a high-frequency inter- or intra-urban railway system, which is entirely or largely separate from other main line railway operations. Metro systems often, but not always, feature sections of underground railway and underground stations. Metros can use either conventional heavy rail technology (heavy metro) or modern light rail technology (light metro). An example in Britain of heavy metro would be the London Underground; examples in Britain of light metro are the Tyne and Wear Metro and the Docklands Light Railway.

1. Find the correct title for each part.

	Part 1		Metro.
	Part 2		First Generation Tramways.
The best title for	Part 3	is	Difference between Trams and Light Rail.
	Part 4		Light Rail.
	Part 5		Trams.

2. Answer the questions below.

1. What exactly is a tram?
2. What is the difference between trams and light rail?
3. What distinguishes trams and light rail from conventional railways?
4. What form of transport allows you to travel about town smoothly, comfortably, quietly, looks great, doesn't spew out noxious fumes over pedestrians, reaches right into city centre pedestrian's areas, doesn't need parking, is economical to use, runs so frequently you don't need a timetable, and generally makes city life that bit more civilised when everything else is making it less civilised?
5. What is this? Read the following information.

Clean and green		enhances the environment – no emissions at street level
Safe		many times safer than car travel
Speedy		short journey times
Avoids	traffic	through segregation and priority
congestion		
Smooth		no violent movements vertically, laterally, or backwards/forwards
Comfortable		
Compatible		with pedestrians in pedestrian's areas
Civilising		more human, more liveable place
Acceptable	and	only rail borne modes can in practice get people out of cars
accepted		
High capacity		only heavy metros have higher carrying capacity
Affordable		the cheapest and best value form of quality mass transit
Reliable		can keep going when snow or ice defeats road vehicles

- Versatile** can run at high speeds on segregated way and can penetrate narrow historic centres
- Adaptable** can cope with steep gradients and tight curves
- Space age technology based on sound foundations and experience of 100 years
- Capable of going underground, or overground or ‘at grade’ (on the surface)
- Offer** frequent services that rival convenience of car
- Offer** ‘seamless journey’ interchange from/to feeder services and to and from train services
- Offer** level boarding with easy access for everyone, including wheel-chair users
- Offer** Park & Ride so outer commuters need not drive to city centres
- Offer** through ticketing for day and regular users

3. Find out if the following statements are true (T) or false (F).

1. A tram is an enclosed carriage intended for public transportation, powered () by electricity, and designed to run on rails located in the street.
2. Light rail is a form of urban rail public transportation that generally has a () lower capacity and lower speed than heavy rail and metro systems, but higher capacity and higher speed than traditional street-running tram systems.
3. Metro is not light rail, and it is not a tram – metros are faster and have () more capacity.
4. Tram, streetcar or trolley systems were common throughout the () industrialized world in the late 19th and early 20th centuries, but they disappeared from many cities in the mid-20th century. In recent years, they have made a comeback.

Text 4. Skoda Tramcars

The three-section modular for city tramcar, with 100% low-floor and very high usability for the most demanding service conditions of medium-sized to large European cities, is the most modern tramcar vehicle developed by ŠKODA TRANSPORTATION.

Gearless individually controlled synchronous traction motors with permanent magnets, together with IGBT invertors, distinctively reduce both energy requirements and maintenance costs. The electrical equipment is placed in easily accessible compact containers mounted on the roof. The car bodies of all vehicle sections are made of well-proven materials, ensuring a long lifetime and excellent reliability.

Sufficient traction motors power and pivotable bogies enable For City tramcar the required starting, drive or braking dynamics for curved tracks in crowded city centres.

Easy boarding is enabled by an entrance height of 320mm above TOR. Full barrier-free access is provided by the retractable platform in the first door area. Useful low-floor area represents 100% of the entire vehicle floor.

Inside the spacious interior, there is plenty of space for baby-buggies and passengers with reduced mobility. Travelling in the vehicle, with its comfortable seats, comprehensible information system, and overall thermal comfort, is a pleasure for the passengers.

In its basic design for the Riga Transportation Authority, the For City tramcar is equipped with closed-circuit TV (CCTV) and a separate air-conditioned driver's cabin.

Five-section low-floor tramcar ELEKTRA 13 T is produced specially for the Czech Republic. It has been derived from the sister tramcars ELEKTRA 14 T and 16 T.

Asynchronous traction motors and digitally-controlled voltage inverters together with the recuperation possibility dramatically reduces both energy requirements and maintenance costs. Electrical equipment is placed in easily-accessible compact containers mounted on the roof. Car bodies of each vehicle sections are made of well-proven materials, ensuring long lifetime and excellent reliability.

Tramcar ELEKTRA 13 T has sufficient starting and braking power to operate on demanding steep track gradients (up to 85 ‰), full adhesion is commonplace. Drive on curved tracks is simplified by the computer control limiting speed to safe values.

Entrance height of 350 mm above TOR enables easy boarding into the vehicle. Full barrier-free access on every track section is provided by the retractable bridge plates in the wide door area. Useful low-floor area represents 50% of the entire vehicle floor.

Inside the spacious interior it has been counted with plenty of space for passengers with reduced mobility. Comfortable cushioned seats are provided with easily changeable and cleansable covers. For the passenger riding comfort the comprehensible information system is available.

In its basic design for city Transportation Authority, tramcar ELEKTRA 13 T is equipped with Closed-circuit television (CCTV), separated air-conditioned drivers cabin and passenger information system with a supplementary LCDs.

Tramcar ŠKODA ELEKTRA 06 T is **bi-directional, five-section low-floor** vehicle, intended for the 950 mm track gauge (1000 mm variantly).

Asynchronous traction motors and digitally-controlled voltage inverters together with the recuperation possibility dramatically reduces both energy requirements and maintenance costs. Electrical equipment is placed in easily-accessible compact containers mounted on the roof. Car bodies of each vehicle sections are made of well-proven materials, ensuring long lifetime and excellent reliability.

Entrance height of 350 mm above TOR enables easy boarding into the vehicle. Full barrier-free access on every track section is provided by the remotely-controlled retractable bridge plates in the wide door area. Useful low-floor area represents 65% of the entire vehicle floor.

Inside the spacious, fully air-conditioned interior it has been counted with plenty of space for baby-buggies and passengers with reduced mobility. Even on the 950 mm gauge, free passage through the entire low-floor area is possible without

crossing any height steps. For the passenger riding comfort the comprehensible information system is available.

Tramcar ELEKTRA 06 T is equipped with Closed-circuit television (CCTV), transceiver and PA switch control.

1. Read the text and put the necessary information in the table below.

	Advanced Technology	Easy Boarding	Comfortable and Practical Interior	Special Equipment
Three-section, 100% Low-floor Tramcar				
Five-section Low-floor Tramcar				
Bi-directional Five-section Low-floor Tramcar				

2. Match the following words and translation.

- | | |
|-----------------------------------|--|
| 1. Basic technical data | A. Висота над верхом колії |
| 2. Transportation capacity | B. Перевізні якості |
| 3. Catenary voltage | C. Загальна кількість пасажирів |
| 4. Axle arrangement | D. Формула ходової частини |
| 5. Track gauge | E. Кількість місць для пасажирів, що стоять |
| 6. Maximum speed | F. Ширина колії |
| 7. Length over buffers | G. Ширина |
| 8. Width | H. Довжина по буферам |
| 9. Height above tor | I. Кількість місць для пасажирів, що сидять |
| 10. Floor height above tor | J. Основні технічні дані |
| 11. Traction motor output | K. Максимальна швидкість |
| 12. Low-floor area ratio | L. Напруга контактного дроту |
| 13. Number of seats | M. Частина площі з низьким рівнем підлоги |
| 14. Number of standing passengers | N. Висота підлоги над верхом колії |
| 15. Total number of passengers | O. Потужність тягових двигунів |

3. Find in the text the English equivalents of the following Ukrainian word combinations.

1. трьохсекційний трамвай _____
2. знижений рівень підлоги _____
3. окремо керовані синхронні тягові двигуни _____
4. енерговитрати _____

5. витрати на експлуатацію та обслуговування _____
6. кузов _____
7. довговічність _____
8. висока надійність _____
9. потужність тягових двигунів _____
10. поворотний візок _____
11. динаміка розгону, руху та гальмування _____
12. зручність посадки _____
13. висувна платформа _____
14. дверний отвір _____
15. місце для пасажирів з обмеженими можливостями _____
16. наочна інформаційна система _____
17. тепловий комфорт _____
18. повністю кліматизований салон _____
19. система відео спостереження _____
20. кабіна управління _____
21. окрема система кондиціонування повітря _____

Text 5. Tram in UK

There are eight tramway / light rail systems in the UK – in Croydon, London’s docklands, Birmingham, Manchester, Sheffield, Newcastle, Nottingham and Blackpool. Other new light rail schemes are in the planning stage in South Central London and Edinburgh. Systems are also proposed in Leeds and Liverpool, although funding has been refused by the government, making them unlikely to proceed; for the same reason plans for schemes in Bristol and Portsmouth have been abandoned.

Modern trams are quite different to the first generation of trams which served our towns and cities from the Victorian age until the middle of the last century. In the early part of the twentieth century nearly every city and major town of any size, and quite a few of no size at all, had trams. Only one of these original systems survives, in Blackpool. What first-generation and second-generation tramways have in common is that they can both run through streets to provide a more convenient transport service than heavy rail, which is segregated from, rather than part of, the urban built environment, while being able to deal better and more efficiently with high traffic corridors than buses.

Two of the systems mentioned in this site are properly termed Light Rail rather than tramways, as they feature no street running, but they do share much in common in terms of vehicle and infrastructure construction. Tram and Light Rail systems use lightweight vehicles, which operate at lower speeds than conventional rail vehicles, and stops or stations are usually less substantial than heavy rail stations – some of the stops on the new Nottingham Express Transit are little more than a raised kerb and a next-tram indicator. This makes such systems cheaper and quicker to build and extend. Lighter vehicles means faster acceleration and shorter stopping distances, which in turn means stops can be placed close together. Another advantage of light

rail technology is that stops or stations can be closer to the places they serve, and to other modes of transport at interchanges, than heavy rail routes.

The first of the modern light rail systems to open in this country was the Tyne & Wear Metro in Newcastle, in 1980. This uses light rail technology but is closer to heavy metro in operation, with no street running and substantial stations set quite far apart, largely inherited from the rail routes it took over. There underground sections and stations in the city centre, and the system also shares some track with heavy rail services on the recently-opened route south to Sunderland.

In 1987 came the Docklands Light Railway, which was a mixture of innovative new viaduct construction and reuse of long-abandoned railway alignments. This system is still light rail rather than tramway, with no street running and substantial stations, but many of the stops are much closer together than you would expect with conventional heavy metro, and there are plenty of tight curves and steep gradients which would be unmanageable for conventional railway vehicles.

The DLR was constructed primarily to serve the redeveloped docklands area of east London, which has changed beyond recognition in the years since the system opened. In the central part of the docklands development, around Canary Wharf, the urban landscape has evolved around the DLR, with stations at the heart of new developments, rather than the transport system having to fit in around existing structures. Another interesting aspect of this system is that it is fully automated and driverless.

The first of the second-generation street-running tram systems was Manchester's Metrolink. This opened in 1992, using former railway alignments for much of its route, but with a section through the streets of the city centre. The system has since been extended, and after a hard fight to obtain funding, a substantial expansion of the system is planned. When Metrolink was opened 'tram' was considered to be a dirty word, and the system was referred to as Light Rail or 'hybrid', and the vehicles as 'Light Rail Vehicles' rather than trams, but Metrolink's position has softened as it has become clear that people actually quite like trams, and don't see them as old-fashioned.

The next milestone was the opening of Sheffield's Supertram in 1994, with extensive street running, both shared use and reserved track. The system was ambitious, with three lines radiating from the city centre. Supertram ran into heavy financial difficulties, due partly to its planning and partly to heavy competition from deregulated bus services, and could easily have spelt the end for new tramway construction in this country; more recently, however, usage has increased. Planned extensions to the system have been abandoned due to lack of central government funding

Birmingham's Midland Metro opened in 1999. It is a single line, serving one transport corridor out of many in the West Midlands, the country's second largest metropolitan area. Most of the line uses a former railway alignment, with a short section of street running in Wolverhampton. In Birmingham the tramway uses platforms in Snow Hill main line station, although there are plans to extend the line

on-street through the city, which will help the system begin to fulfill its potential. Extensions to other parts of the West Midlands are also in the pipeline.

Then in 2000 came Croydon Tramlink in south London, a network of three lines (one with a short spur) radiating out from Croydon, where the trams run in a loop around the town centre on the street. This system was more successful than Sheffield, and there are plans for several extensions. There are also two more tramway systems under consideration in London, one of which could potentially connect with Croydon Tramlink to enable trough trams to run between Croydon and Central London. Trams are only one of a number of transport modes in Greater London, which is also served by extensive heavy rail routes, an large heavy metro system (the London Underground) and a vast and comprehensive bus network. Croydon is a significant local centre, and is a major destination in local travel; Tramlink filled the gaps where some local areas were poorly served by existing transport.

The latest tramway to open (2004) is Nottingham Express Transit, which once again combines the use of former railway alignments with extensive street running. Since its opening NET has been very succesful, and is significant in being the first modern light rail project outside of a Metropolitan County. Extensions are already planned.

Still running, after nearly 120 years, Blackpool’s tramway is the last remaining first-generation street-running tramway in the UK. There is talk of converting it to a more modern light rail system, but for now traditional single-and double-deck trams still provide an important public transport service between this busy seaside town and Fleetwood, just up the coast. The system involves street running in Blackpool and Fleetwood, with tram stops that are often no more than a bus stop-style sign. Between the two towns the tramway runs on reserved track with stops further apart, similar to more modern interurban tramways.

1. Answer the following questions.

1. How many trams or light rail systems are there in the UK?
2. What are the differences between modern trams and the first or second generation of tram?
3. What are advantages of light rail technology?

2. Complete the table ‘The History of Tram or Light Rail System in United Kingdom’.

Date	What happened

3. Put the words from the box into the gaps.

street-running
the city centre

the current network
power supply

low-floor
railway stations

Manchester's Metrolink was Britain's first second-generation (1) _____ tramway. Phase 1, between Bury and Altrincham via (2) _____, opened in stages, with the first section commencing operation on April 6th, 1992. The initial system was extended with the Phase 2 line to Eccles, which opened in two stages in 1999 and 2000. Many more extensions are planned. The system is a mixture of on-street running and reserved track, and (3) _____ is 24 miles long.

There are 32 Ansaldo trams, built in Italy – 26 were built for the original Phase 1 lines and a further 6 were delivered for the Eccles extension. They take their power from a 750Vdc overhead (4) _____. The trams are not (5) _____, but there is step-free access to all services with the use of raised platforms.

Trams run every 6 minutes Monday – Saturday daytime on the Bury and Altrincham lines, and every 12 minutes to Eccles. Metrolink serves 37 tram stops – many of these are former (6) _____ (e.g. Whitefield) and the remainder are newly-built stops (e.g. Anchorage). There is interchange with National Rail services at five stops.

Text 6. London Trams

Trams operated in London from 1861 to 1952 and re-emerged in 2000.

London Trams is an arm of Transport for London, which manages the second generation of tram services within London. Current and planned tram systems are:

- Tramlink operates a three-route system in the area of South London around Croydon.
- West London Tram is a planned new system in West London from Shepherd's Bush to Uxbridge.
- Cross River Tram is a proposed new system in Central London from King's Cross and Camden to Peckham and Brixton.

Tramlink (until recently known as Croydon Tramlink) is a public transport tramway in south London, operated by First Group on behalf of Transport for London. Tramlink meets National Rail lines at a number of stations, but because it runs in an area relatively under-served by the London Underground (one of the reasons for its creation); its only interchange with the Underground is at Wimbledon. The system, centered on Croydon, began operation in May 2000.

1. Read the text and make up 5 questions to it.

2. Find the words in the text which mean.

1. to start working
2. to reappear

3. a group of things that were developed from something else, or from which better things were developed
4. something that has been formally suggested to an official person or group
5. instead of something, or as their representative
6. why someone decides to do something, or the cause or explanation for something that happens
7. a point where two or more motorways or main roads meet

3. Make up 2 sentences with each word.

Text 7. Tram Network to Carry 50 Million

As London's **congestion** problems worsen – traffic in central London now moves at 3 kilometres per hour – a new tram **network** in West London is being seen as a potential solution.

Upon its completion in 2009, the 200 million pound West London Tram **Scheme** will carry 50 million passengers a year, running from the **suburbs** to the edges of central London. The scheme will deliver major environmental and social benefits, with 75 per cent of the public who took part in public consultation **approving of** the plan.

However, there is resistance. Local residents in the western suburban districts say that nearly 30 000 vehicles will have to be **diverted** from the tram route onto what are currently quiet residential roads. More than 11000 residents have signed a **petition** demanding an urgent meeting with the mayor of London, who is **backing** the tram **network**. They feel their quiet roads will become dangerous, noisy and polluted.

The Mayor of London, Ken Livingstone, feels there is no other option than **to implement** this scheme, as the traffic is so heavy now, the tube trains are filled to capacity and the buses are struggling to cope with the number of passengers. He said that other tram **schemes** had cut road journeys by 20 per cent and improved the local quality of life.

1. Find out if the following statements are true or false.

1. Cars in London move fairly quickly. ()
2. The tram network will cover all areas of London. ()
3. The majority of the public think the plan is a good idea. ()
4. People in central London disagree with the plan. ()
5. The people who disagree think there will be more cars on their local roads. ()
6. The Mayor of London thinks the plan is a good idea. ()
7. The people who disagree think the trams will be dangerous. ()
8. The tube trains have space for more passengers. ()
9. The buses find it hard to carry all the passengers. ()
10. Tram schemes generally reduce traffic. ()

2. Write answers to these questions.

1. What are the reasons for starting this new tram network?
2. What are the reasons against starting this new tram network?
3. Do you think it is a good idea?
4. How would you improve the transport system in your local area?
5. Would you like new forms of transport?
6. How could you improve the system you already have?

3. Match the words on the left with their definitions or synonyms on the right.

- | | |
|---------------------------|---|
| 1. congestion | A. plan |
| 2. network | B. agreeing with / liking |
| 3. suburbs | C. a large interconnected system |
| 4. Scheme | D. heavy traffic |
| 5. approving of | E. area where people live outside a city centre |
| 6. diverted | F. to support something |
| 7. petition | G. to carry out / put into practise |
| 8. to implement something | H. change in direction |
| 9. to back something | I. a written request signed by many people |

Text 8. The First Tram Service in Ukraine

The **Kiev tram** which serves the Ukrainian capital city of Kiev, was the first electric tramway in the former Russian Empire, and the third one in Europe after the Berlin tram and the Budapest tramway. The system currently consists of 139.9 km of track, including 14 km of the first 2 light rail lines, which were opened in 1978. However, the serviced track length is decreasing at a fast rate and is replaced by more modern buses and trolleybuses.

Before 1886, projects for the construction of a horse-drawn tramway were planned. However, none of these plans had ever proceeded to the construction stage. In 1886, engineer Amand Struve's project was approved for construction. On July 30, 1891, the first horse-drawn tram wagon was set on a track. By August 1st, the tram line stretched from the Tsar's Square (now the *European Square*), to the Demiivs'ka Square.

Soon after tram operations were started, many problems arose. The hilly terrain of Kiev presented the largest problem. On Bohdan Khmelnytsky Street, a pair of horses was not enough to pull the trams uphill. Therefore, another two pairs of horses were added, which unfortunately did not improve the situation. Thus, mechanizing the tram using a steam-powered engine was attempted as a solution to the problem. However, the steam engines produced a lot of noise, which scared the horses and people, and produced a lot of air pollution.

The slew of problems experienced by the trams shocked Struve who in 1890 had written a letter to the City Administration of Kiev suggesting that for increased safety and easier use, the trams would need to be powered using electric motors. The

administration of the Kiev Telegraph service opposed this move since, in their opinion; the electric motors would interfere with the telephone and telegraph systems.

On May 3, 1892, the first two trams with electric motors arrived in Kiev. They were built by the Struve brothers in a factory located near Moscow, based on American designs. On the same day, the engines were tested on the flat Sahaydachny Street, and once more, on May 8, on the track from Podil Street to Khreschatyk Street.

In 1893, the money earned by these electric trams exceeded the cost to maintain the trams. Furthermore, the electric trams were used whenever the horse-drawn or steam-powered trams had difficulty. Nevertheless, the system's horse-drawn trams were in use until 1895, and the last steam-powered cars ran until 1904, when a diesel electric station, on the so-called Dachna to Puscha-Vodytsia line was built. This station had lasted until the 1930s. These trams required very little power, which caused any electric trams, which used the line, to move so slowly that the passengers could get on and off the tram, while the tram remained in motion.

A long tram line, about 18 kilometres long, was laid from the Poshtova Square in the Podil neighborhood, over the Dnieper on the Nicholas Bridge, through the Peredmostna and Nikolska Slobodka neighborhoods, and to the neighboring town of Brovary. The line was used until the mid-1930s, and was a one-way line with side-skirts for oncoming trams to drive into. This had made the trip even longer than it really was. The cost was 35 kopecks, a fair amount of money at the time. Nevertheless, the trams were always packed with passengers.

By 1893, the city's trams easily climbed the many steep streets of Kiev, including the Prorezná, Karavayevs'ka (now the *Ploscha L'va Tolstoho*) and even the Kruglouniversitets'ka Streets. In 1893, the journal *Elektrichestvo* wrote:

'If Kiev's terrain had not been so unique, then it would have taken many years before electricity would have been used to power the trams.'

A major problem of the tram drivers at the time were the rolling stock used. When the city's railroad stock holder L. Brodskyi died, the stocks were transferred to the Belgian auction firm, and the tram system began running on the Belgian *Pullman* wagons, with soft, sail-type cloth seats. But not these, nor the earlier seats on the German wagons, gave the tram drivers any comfort while standing in wind, rain, or snow, on the driver's platform on the tram.

After the Russian Revolution and the Russian Civil War, reconstruction of the tram system began. The old and outdated tram wagons required restoration as the industry of the country could not manufacture new wagons. The train wagons' reconstruction was carried out in the main tram depot of the system, the 'Dombal Depot.' From 1928 – 1932, 80 two-axel motor tram wagons and 65 regular train wagons were manufactured for Kiev, and since 1932, the depot started producing four-axel tram wagons, due to Kiev's geographical relief and climate. On the tram wagons, the conductors place was not warmed during the winter, however, was separated from the passenger part of the wagon.

The Kiev tram system uses many different tram cars and types, with some being designed in Moscow and manufactured in Riga, some being manufactured by the

ČKD Tatra company in Prague, and with some being manufactured right in the city of Kiev. The following data incorporates only some tram cars used by the system.

1. Answer questions.

1. What was the first type of trams used in Kiev?
2. What problems arose when the tram started operating in Kiev?
3. What was the solution of this problem?
4. Why didn't the Administration of Kiev agree to use trams with electric motors?
5. Where were the first electric trams built?
6. Where were the electric trams used?
7. What was the problem of diesel electric station?
8. What was the fare in the tram?
9. Why did the rolling stock start operating in Belgium?
10. When did the reconstruction of tram system begin?
11. What type of motor tram wagon did the 'Dombal Deport' manufacture in 1928 and in 1932 years?

2. Define what all these numbers mean (according to the text) and fill in the table.

Number	Definition
139,9	
1886	
1891	
1892	
1895	
1904	
1928 – 1932	
1932	
65	
80	

3. Find the synonyms of the words.

Words from the text

1. construction
2. proceed
3. approve
4. stretch
5. terrain
6. improve
7. pollution
8. safety
9. interfere
10. exceed
11. cost
12. maintain

Synonyms

- A. endorse
- B. security
- C. reorganization
- D. repair
- E. make better
- F. spread
- G. building
- H. go
- I. region
- J. dirtying
- K. impede
- L. wagon

13. reconstruction
14. rolling stock

- M. expenditure
- N. transcend

Text 9. Trams in Kharkiv

Trams were the first type of electric vehicle in Kharkiv. Kharkiv tram's birth was long and painful. A large obstacle in its way was horse tram, the property of a Belgium anonymous company.

On the 31st of May 1882 the Kharkiv municipal government negotiated the contract with the French citizens Bonn and Otle about the 17,5 verst horse-railway devices for passengers and commodity transportation.

On the 24th of September 1882 the first site of the first tram line was opened in Kharkiv. Its route was a corner of Oleksandrivs'ka Street (nowadays it is Chervonoarmiys'ka Street) and Ekaterynoslavs'ka Street (today it is Poltavasky Shlyah), Ekaterynoslavs'ka Street, through the Lopan Bridge and Trading Square (now it is Proletars'ka Square) up to the building of Stock Exchange (now it is the corner of Rose Luxembourg and Constitution Squares). Horse tram was a small covered platform on wheels, put on rails. It contained 20 passengers. The easy roof on racks protected passengers from rain and sun rays. From lateral faces longitudinal footsteps on which passengers rose were arranged and the conductor selling tickets moved. For the winter easy walls with windows were established. Boarding platforms were on the horse tram side near the coachman who sold tickets. In winter easy walls with windows were established. Horse trams have served in Kharkiv up to the end of the 20th years of the last century. Because of shortage of rolling stock they were used as trailer to cars of an electric tram.

On the 3rd of July 1906 in Kharkiv streets the first electric trams rang out.

On the 23rd of September 1909, the construction of single-gauge tram line in the district of Sergiyivska Square – Klochkivska Street – Ivanivska Street from Blagovischenska Church to the end of Velyka Panasivka Street was completed. Work on the construction of the second line in Velyka Panasivka Street began.

On the 17th of December 1909, at 11 a.m., the solemn opening of Klochkivsko-Panasivska line of electric tram was held.

In 1928 250 trams were in Kharkiv.

In 1962 727 trams worked in the city.

In 1973 31 tram lines operated in our city.

There probably is no Kharkivite who has never taken a trip in a tram. Every day tens of thousands of people travel about our city in comfortable tram carriages with daytime light, automatic doors, convenient seats, and large windows. Old people remember narrow-gauge Kharkiv tram, with passengers, hanging as grapes on its stairs, with bells transmitted with a rope, with boys traveling on the carriage buffers. It has its own peculiarity: it is the only tram in the world whose route numbers are named 'marks'. There appeared many tram lines connecting new micro-regions to the centre. The tram has become an essential part of our life. Kharkiv tram has been working for about 100 years despite the appearance of new types of transport: buses,

trolleybuses, taxi, subway... But even now it is full of force and energy and for a long time it will be an irreplaceable mean of city transport.

1. Answer the questions.

1. Why was the appearance of Kharkiv tram difficult?
2. When was the first Kharkiv tram line opened and what was the route?
3. How many passengers could the horse tram contain?
4. Describe the first horse tram.
5. How long have horse trams served in Kharkiv?
6. When did the first electric tram start operating in Kharkiv?
7. What new lines were opened in Kharkiv?
8. Describe modern trams and compare them with the old ones.
9. How long has tram been working in Kharkiv?
10. What new types of transport appeared in Kharkiv along with trams?
11. From your point of view, what is the future of tram lines in Kharkiv?

2. Complete the table 'The History of Kharkiv Tram'.

Date	What happened

3. Using the following information make up a composition about Kharkiv tram Line 2.

Маршрут трамвая №2 у Харкові – від проспекту Перемоги до 602 м / р – найдовша лінія в місті, з довжиною оборотного кола 47 км 700 м і розрахунковим часом проїзду 3 години 10 хвилин. У 1970-і роки – найдовший трамвайний маршрут в УРСР.

У 1957 році № 2 його маршрут був від селище Салтівське до Павлівки через вулицю Академіка Павлова, площу Повстання, вулицю Кірова, вулицю Греківська, Пролетарську площу та вулицю Клочківську.

Вартість проїзду	1 грн.
Час оборотного рейсу	190 хвилин
Довжина оборотного рейсу	47.7 км.
Кінцеві станції	Просп. Перемоги (трамвайне коло) – 602-й мікрорайон
Шлях прямування	Просп. Перемоги (трамвайний коло) – пр. Перемоги, вул.

	Клочківська (туди: Новий міст, вул. Котлова; назад: взд. Рогатинський, пров. Піскуновський), пров. Лосевській, Бурсацький міст, вул. Клочківська, пл. Пролетарська, вул. Університетська, пл. Ірини Бугримової, вул. Греківська, пров. Рибасовській, вул. 1-ї Кінної Армії, вул. Кірова, пл. Повстання, пр. Московський, вул. Академіка Павлова, пров. Салтівський, Салтівське шосе – 602-й мікрорайон
Проходить поблизу станцій метро	«Центральний ринок», «Радянська», «Історичний музей», «Площа Повстання»
Типи рухомого складу	Tatra-T3
Маршрут обслуговує	Жовтневе трамвайне депо, Салтівське трамвайне депо

4. Make up a short composition about municipal electric transport problems in Kharkiv (or in Ukraine) nowadays.

5. Read the text about the rules of travelling by public transport in EU and compare them with the way of travelling by city transport in our country. In the text find

a) the synonyms of these words:

to get on	pass	to buy	getting on
to get off	pram	trip	getting off
marker	invalid	voucher	disable persons

b) and opposites for the following ones:

minimum	separate	spend	return
irrelevant	limited	prize	illegal
allowed	far from	back	in the daytime

Tickets

For travelling by city transport routes, **the tariff is based on zones**. Journeys by one connection are divided into two ones. Tickets for one zone are valid for a journey of up to five consecutive stops (excluding the stop you boarded the bus at). Travel tickets for two zones are valid for an unlimited length of journey by one connection.

If you do not travel often, single (either non-transfer or transfer) tickets are most suitable for your journey. The conditions for the latter are: a change is allowed only once, time for change is maximum 30 minutes from the first validating of the ticket, and both journeys must be validated on the ticket. If you travel with hand luggage, you can save money by using combined tickets.

If you travel more often, you can save money by using prepaid tickets. For travelling at night (11 p.m. – 5 a.m.), there is night tariff. In this period, neither discounts are valid. Prepaid tickets (except electronic tickets) can be used for night travelling. Tickets are sold at a number of locations (ticket machines at stops and stations, contracted vendors and transport operator ticket offices). If you do not purchase a ticket before boarding, the driver can sell you a two-zone non-transfer ticket.

Getting On and Getting Off

During the day time operation (5 a.m. – 11 p.m.), boarding and alighting is allowed via all doors. If you have a pushchair for children or wheelchair, you can board by the door that is marked by the respective sign (usually the second or third door). To alight with a pushchair or wheelchair you must notify the driver by pushing the button next to the door twice. At night (11 p.m. – 5 a.m.), boarding is allowed only via the front door.

In the front part of each vehicle, there are several seats reserved for older, less mobile and blind people. Please vacate the seats for them as you will make their travel easier.

According to EU law for the protection of non-smokers it is forbidden to smoke in all public transport and in the area of transport stops and shelters as well as in the distance of up to four meters from the designated platform.

Validating the Ticket

After entering the bus, do not forget to immediately validate your ticket in the validator next to the door. The passenger is obliged to mark his/her voucher immediately after having entered the vehicle by means of the near-by marker. The voucher not marked is invalid.

Passengers with prepaid travel tickets are required to validate their tickets. Next to each door of the bus, there are one or two validators. Most of them can be used for validating both a single journey and prepaid tickets, some validators can only be used to validate single journey tickets.

To validate the single journey paper ticket, please insert the ticket into the slot in the direction of the arrow and hold it there for a few seconds. On the validator display, you will see red lights and the ticket will be validated with the relevant data.

Prepaid tickets can be validated by placing the chip card next to the validator at the designated place. When the chip card has been validated, the red lights will be shown and the validator beeps. If you hold the chip card there for longer, you can check the number of remaining journeys and validity of your card. If the validating of the card is not successful, the validator will beep three times.

Ticket Inspection

It is necessary to have the valid ticket during the travel and also at the time of getting off the vehicle! If you are unable to produce a valid ticket for your journey you risk a penalty fare of 56.43 euro. If you are unable to produce a valid ticket for your luggage or animal, you risk a penalty fare of 2.99 – 5.64 euro.

UNIT TEN. TROLLEYBUSES

Text 10. Tram and Trolleybus

The fundamental difference between trams and trolleybuses is that trams have flanged wheels and run on rails like a train; whereas trolleybuses have conventional rubber tyres for ordinary road surface and are essentially electrically powered buses.

Trolleybuses take their electric power from a pair of parallel overhead wires by means of a pair of booms fitted to the top of the vehicle. Trams normally take their power from a single, thicker overhead wire suspended from a catenary wire, by means of a pantograph fitted to the top of the vehicle.

The reason trams only use a single electric contact wire is that they use the running rails for the electrical return to complete the electric circuit to provide the power. Trolleybuses, having no rails, and indeed being insulated by the rubber tyres, need the second overhead wire to provide the electrical return and complete the circuit.

Trams are normally electrically powered but don't have to be, and indeed the earliest passenger tramways in the 19th century were horse-drawn and later steam powered, until replacement by electric power at the end of the 19th century, when the real boom in street tramways started in cities and towns in Britain and elsewhere.

Some early electric tramways didn't use overhead wires, but took power from a line of metal 'studs' in the road surface connected by electric cable buried in the road. This had disadvantages which were occasional electric shocks to unwary people or horses, and damage to other buried pipes and cables through stray electric currents leaking through the subsoil.

The need for expensive track replacement, or repair, through neglect in the war years together with the replacement costs for new trams lead to the rapid decline of tramway systems during the early 1930s with their replacement by cheaper and more flexible buses or trolleybuses. The investment in the undertakings tramway traction electrical supply systems remained viable in many British cities for replacement trolleybus and this factor created a booming market for these vehicles throughout the 1930s and 1940s.

There were a few new trolleybus routes or extensions built right up until the early 1960s but by then most trolley vehicles were in need of replacement. The limited market for UK trolleybuses saw an unhealthy price differential with diesel buses and this swayed many operators to close their trolleybus networks. In London trolleybus appeared 16 May 1931 and ran till 8 May 1962. London had by far the biggest trolleybus network in Britain, including the 607 route along Uxbridge Road which replaced the original tram route, and which many present or former Ealing residents remember with affection. London's trolleybus network had all gone by the early 1960s being replaced by diesel buses.

Trolleybuses have advantages over trams in that they can steer round obstructions such as parked vehicles or accident scenes, or in emergency swerve to avoid an accident themselves, within reason. The electricity pickup booms swivel so the trolleybus can deviate from the course of the wires. They can also be fitted with

auxiliary power, such as a battery, so that they can go ‘offline’ away from the route of the wires if need – for example this could be done in instances such as the IRA bomb incident in Ealing Broadway last year.

Trams on the other hand are confined to their fixed track, and are stuck in the event of a blockage of the line for whatever reason. This is being represented by proponents of the proposed Uxbridge Road tramway scheme as an advantage of trams in that this dictates that other traffic has to be removed from the road, or is deterred from obstructive behaviour by the knowledge that they’ll be blocking the tramline. In any case trolleybus routes can be given priority by means of bus lanes, or even concrete guided bus ways where road space permits, but this can be dispensed with where there really isn’t space to provide an exclusive right of way for the trolleybus without swamping other, local roads with displaced traffic.

The other disadvantage of trams is the high cost, construction time and disruption which installing tram lines on the road involves. Modern street tramways necessitate all the mass of underground pipes and cables [gas, water, electricity, telecom] to be relocated away from the route of a street tramway, so that the tram route is not forever blocked by these other ‘statutory undertaker’ companies digging up the road to get and repair their pipes or cables. This takes a long time and costs a fortune even before the tram track can be laid, which itself is very expensive. A trolleybus route can be installed for a fraction of the cost and construction time of a street tramway. Thus we could get a lot more trolleybus route for the price of a single tram route, and get it a lot quicker.

1. Answer the questions.

1. What are the differences between tram and trolleybus?
2. What was the tram era in the United Kingdom?
3. What was the trolleybus era in the United Kingdom?
4. What British city had the largest trolleybus system in the United Kingdom?
5. Why was trolleybus replaced by diesel bus?

2. According to the text complete the following tables.

Tram	
Advantages	Disadvantages
1. 2. 3. ...	1. 2. 3. ...

Trolleybus	
Advantages	Disadvantages
1. 2. 3. ...	1. 2. 3. ...

3. Find out if the following statements are true (T) or false (F).

1. Trolleybuses are twice as energy efficient as diesel buses. ()
2. The operation of trolleybuses results in less common air contaminant emissions per km than are produced by internal combustion buses; trolleybuses are environmentally superior whereas diesel bus emissions cause cancer and are linked to asthma, chronic respiratory disease and heart disease; there is no safe level of diesel exhaust exposure. ()
3. Excellent operational characteristics, such as quick acceleration even with full passenger complement. ()
4. They perform well in stop-and-go traffic and on busy routes. ()
5. Trolleybuses have lower health costs associated with their operation. ()
6. Trolleybuses have greater potential to reduce greenhouse emissions in the long-term. ()
7. It is possible to make trolleybuses totally emission-free with wind power technology. ()
8. Trolleybuses produce markedly less noise, contributing to better communities. ()
9. The additional cost of operating trolleybuses vs. diesels is negligible in the overall operating costs of transit. ()
10. Electrically powered vehicles provides security against future price rises associated with the depletion of world oil reserves. ()
11. The popularity of the trolleybus around the world has been growing strongly over the past five years. ()
12. Users of trolleybuses feel that the vehicles contribute to community character. ()
13. More attractive to passengers than diesel buses. ()
14. Although cleaner than diesel buses, none of the existing and new alternative technologies [CNG, hybrid] can really compete with the trolleybus in terms of the overall toxic emissions profile, load capacity, reliability. Fuel cell buses are currently unproven, but are not likely ever to match the trolleybus in terms of energy efficiency. ()

Text 11. Trolleybuses in UK

In the United Kingdom the first trolleybuses entered service in Bradford with Bradford City Corporation for Trams and Buses on 20 June 1911. Coincidentally, the UK's last trolleybus service also operated in Bradford, on 26 March 1972. More than 50 systems existed in the past, and a large number of trolleybuses have been preserved at British museums. The world's largest collection of preserved trolleybuses is at The Trolleybus Museum at Sandtoft in England. Examples are also preserved at the East Anglia Transport Museum and the Black Country Living Museum in England. The Bradford Trolleybus Association is restoring Bradford trolleybus 758, the last rear-entrance trolleybus in Britain, which is kept at Sandtoft. The last trolleybuses ran in Bradford in 1972.

The Leeds Trolleybus is a proposed system: no trolleybus systems operate.

Leeds Trolleybus in Leeds, West Yorkshire, England will, if plans go ahead, be the first trolleybus system to be reinstated in the United Kingdom after almost thirty years since the last trolleybus in Great Britain operated in Bradford. The predicted ridership of the Tbus is 16 million passengers per year. The Tbus is a solution to Leeds's traffic congestion problem, with each Tbus able to carry two hundred people.

In 2009 a public consultation is being held, using the name New Generation Transport. There was some minor local opposition but a three quarters of respondents to the survey supported the proposals. The proposals were sent to the Department for Transport in October 2009.

Tbus plans envisage the use of 24-metres vehicles composed of three articulated sections. The front section has two axles, and the rear sections one axle each.

The three lines that will operate in the city are more or less along the same routes the Leeds Supertram would have followed, with one line going to the north to end at Bodington, another to go to the south to Stourton, another to go to St James's University Hospital in the east, and a loop around much of the retail district of the city centre. It has been proposed to build the first line from Stourton to St James' Hospital via the city centre.

1. Answer the following questions.

1. What is the role of Bradford in the trolleybus history in the UK?
2. How many trolleybus systems were in the Great Britain in the 20th century?
3. What is Leeds Tbus?
4. What types of rolling stock will be used in Leeds?
5. Why does the UK want to reinstall trolleybus system?

2. Find words in the text that mean the same or are similar to the following.

1. a bus that uses power from electric wires above the street

2. to use and control a machine or equipment

3. someone who is travelling in a vehicle, plane, boat etc, but is not driving it or working on it

4. a plan or suggestion which is made formally to an official person or group, or the act of making it

5. vehicle has two parts joined together to make it easier to turn

6. the bar connecting two wheels on a car or other vehicle

7. the direction or imaginary line along which something travels between two places

8. a way between two places that buses, planes, ships etc regularly travel

9. travelling through a place on the way to another place

10. the part of a town or city where most of the shops, restaurants, cinemas, theatres etc are

3. Join up the left-hand sentences with the right-hand ones so that they make sense.

The Delights of the Trolleybus

- | | |
|--|--|
| 1. Trolleybuses had been demonstrated as early as 1909 in London, | A. a Royal Commission in 1931 recommended that trams be replaced by Trolleybuses. |
| 2. On 16 May 1931 the London United Tramways started London's first Trolleybus service between Twickenham Junction and Teddington, | B. and by the early 1930s the golden age of the tram was drawing to a close. |
| 3. Throughout the 1920s and 1930s trams more and more came to be seen as noisy and dangerous to other road users | C. which had been formed in 1933. |
| 4. The reluctance of Westminster and the City of London to allow trams on their streets was fundamental weakness in the system | D. and were first introduced in Bradford and Leeds in 1911. |
| 5. Following a failed push to modernise the system, | E. the exception of two spurs to Highgate and Manor House via the Kingsway Subway. |
| 6. This was managed by the London Passenger Transport Board | F. and resulted in the tram network primarily servicing the inner suburbs and not the central area. |
| 7. The process got under way in earnest in 1935 and by 1940 more | G. replacing the tram service. |
| 8. The whole of the North London tram routes had been converted to trolleybus operation with | H. than half of London's trams had been scrapped. |

Text 12. Trolleybuses in UA

Trolleybuses have become more widespread than trams in Ukraine. Trolleybuses are essentially the same as trams, except that they have tires and do not need steel rails. They also do not cause the same dangerous vibrations as trams do. Trolleybuses are used in all larger and many medium-size cities. On the Crimean peninsula, they are even operated on inter-city routes, such as between Simferopol and Yalta.

The trolleybus stock of Ukrainian cities is made up mainly of outdated Russian-made vehicles. Czech Skoda and Romanian DAC trolleybuses are also widespread. In

recent years, domestically made YuMZ trolleybuses, which are manufactured at the Yuzhmash factory in Dnipropetrovsk, have become increasingly popular. In addition, the Aircraft Factory in Kyiv has begun to produce 'Kyiv' trolleybuses.

The first trolleybus system appeared in Ukraine in Kiev on 5 November 1935. It was the third trolleybus system in the USSR.

Trolleybus systems run in more than 25 cities, including the interurban Crimean network connecting Simferopol with Alushta and Yalta on the coast. The Crimean trolleybus network includes the longest trolleybus route in the world, the 86-km route from Yalta to Simferopol.

The trolleybus line, managed by the public transport company Krymtrolleybus, was built in the 1950s in the Ukrainian SSR as an alternative to extending the current railway line in Simferopol over the mountains to the coastal settlements. The line was opened in two parts: Simferopol – Alushta segment was opened in 1959 and the Alushta – Yalta segment in 1961. The journey to Alushta is about 1½ hours long, and the journey to Yalta is about 2½ hours long, and costs about 8 hryvnias.

The trolleybus line's route passes through the Crimean Mountains across the Angarskyi Pass, reaching 752 metres at the road's highest point, then descends down to the resort town of Alushta on the coast. The remaining distance to Yalta is 41 km and winds around the mountains above the sea.

The list of stops of the trolleybus line are: Simferopol Railroad Station – Marine – Lozove – Pionerske – Dobre – Zarichne – Perevalne – Sosnivka – Angarskyi Pass – Kutuzovsky Fountain – Luchiste – Verkhnya Kutozovka – Nizhnya Kutozovka – Alushta – Lazurne – Malyi Mayak – Kiparisne – Pushkine – Partenit – Zaprudne – Artek – Krasnokamyanka – Gurzuf – Ai-Danil – Nikitsky Botanical Garden – Sosnyak – Massandra – Yalta.

The Škoda 9Tr, Škoda 14Tr vehicles are used on the route.

On the 1st of May 1939 the first line of trolleybuses was opened in Kharkiv. In 1962 204 trolleybuses worked in the city. In 1976 32 trolleybus lines were in Kharkiv.

1. Decide whether the following statements are true or false.

1. Trolleybuses and trams are prevalent in Ukraine. ()
2. Trolleybuses need steel rails and trams have tires. ()
3. Trams cause vibration. ()
4. Trams are operated on Crimea peninsular. ()
5. Czech and Romanian trolleybuses are very popular. ()

2. Find words in the text which have the same meaning. Make up 2 own sentences with each words.

1. existing or happening in many places or situations, or among many people
2. one of the two long metal tracks fastened to the ground that trains or trams move along
3. a continuous slight shaking movement
4. all the trolleybuses etc that are used on a trolleybus routes
5. to make

6. a system of lines, roads etc that cross each other and are connected to each other
7. the part of a line or of a length of something between two points
8. a road, river, or line that passes a place goes through or near the place
9. the amount of space between two places
10. a place where different means of transportation regularly stops for people to get on and off

3. Translate into English the following sentences about trolleybus system in Kharkiv.

Тролейбус в Харкові

Перші тролейбуси прийшли до Харкова у березні 1939 року. 1 травня 1939 в урочистій обстановці була відкрита перша лінія харківського тролейбуса. Її довжина становила 6,6 км. Вона пройшла за таким маршрутом: Будинок Червоної Армії (Університетська гірка) – вул. Університетська – Спартаківський провулок – площа Тевельова (майдан Конституції) – вул. Карла Лібкнехта (вул. Сумська) – ЦПКіВ ім. Горького (назад тим же маршрутом). 5 травня 1939 харківський тролейбус почав працювати у звичайному режимі.

Зараз вартість проїзду становить 1 гривню. Діють у місті два депо – № 2 та № 3. П'ять типів пасажирського рухомого складу щодня виходять на лінії.

Проїзд оплачується кондуктору. За відсутності в салоні кондуктора оплата проводиться водієві. Місячний проїзний квиток на тролейбус можна придбати у синіх кіосках на деяких зупинках.

У Харкові діють 25 тролейбусних маршрутів. Деякі маршрути курсують тільки у робочі дні в години пік.

4. Complete the sentences with the correct prepositions.

1. If you want to go _____ trolleybus, you have to go _____ the trolleybus stop.
2. You look _____ the time table.
3. Then you wait _____ your trolleybus.
4. When the trolleybus arrives, you get _____ the trolleybus.
5. You buy a ticket _____ the driver or show your ticket _____ the driver.
6. When you arrive _____ your destination, you get _____ the trolleybus.
7. Sometimes you even have to change trolleybuses _____ another trolleybus stop.

5. Translate the following words and word combinations below and put them in to the text 'Travelling by Tram, Bus and Trolleybus'.

cash	destination	fares	means of transportation
conductor	discount	free	minutes
crew	enter	leave	routs
stop	travelling	tight	traffic jams

Travelling by Tram, Bus and Trolleybus

Tram, bus and trolleybus are usual (1) _____ in common city or town in Ukraine.

Everywhere you can see a tram, a bus or a trolleybus (2) _____ nearby.

There are a lot of tram, bus and trolleybus (3) _____ in each city.

If you would like to get to your (4) _____ by either tram or bus and trolleybus, you should know route number.

Tram, bus and trolleybus usually run regularly, in 10 or 15 (5) _____.

Sometimes you can wait for necessary vehicle for a long time because of (6) _____ and accidents.

When you board a tram, bus or trolleybus, take a seat if one is available or hold on (7) _____.

Most trams, buses and trolleybuses have two-person (8) _____: the driver who drives, and the (9) _____ or conductress if it's a woman who takes your money.

You should pay the driver or the conductor for your travel as you (10) _____.

The tram, bus and trolleybus (11) _____ are fixed in any Ukrainian city, it doesn't depend on the distance you travel.

You should use (12) _____ to pay for your travel, credit cards and cheques are not accepted.

If you are (13) _____ by tram and trolleybus a lot around the city, you can buy monthly pass.

Students in Ukraine have 50% (14) _____ for tram and trolleybus fares, and fare in tram and trolleybus is (15) _____ for pensioners.

Stops are announced, so you can (16) _____ tram, bus or trolleybus when you reach the place of your destination.

Don't get on and off when city transport is running, it is dangerous for your health.

UNIT ELEVEN. TRAINS

Text 13. Trains in UK

1. Find the meaning of the words.

A.

- | | |
|----------------------|---|
| 1. bewildering array | A. міжнародний потяг компанії 'British Rail' |
| 2. coach travel | B. подорож на автобусі |
| 3. InterCity | C. приміський пасажирський транспорт |
| 4. Regional | D. година пік |
| 5. commuter service | E. попереднє замовлення |
| 6. in advance | F. бути збентеженим |
| 7. to secure | G. гарантувати, забезпечувати |
| 8. reservation | H. до, заздалегідь |
| 9. rush hours | I. обласний, районний, регіональний |

B.

- | | |
|---|--|
| 1. passenger train | A. багажний чи товарний вагон |
| 2. baggage car, luggage van, left-luggage car | B. вагон для курців |
| 3. bullet train, bullet, fast train | C. залізничний вагон |
| 4. commuter, commuter train | D. пасажирський потяг |
| 5. couchette | E. потяг, поїзд |
| 6. carriage, passenger car, coach | F. приміський потяг |
| 7. railroad train, train | G. служба руху потягів |
| 8. mixed train | H. спальне місце у вагоні |
| 9. goods train | I. товарний потяг |
| 10. train service | J. товарно-пасажирський потяг |
| 11. smoking car | K. швидкий потяг |
| 12. InterCity, EuroCity, SuperCity | L. швидкісний комфортабельний потяг |

The railway network in the UK is relatively poor by western European standards and can be extremely expensive with a vast and bewildering array of ticket options. However, when covering longer distances it is generally faster and more comfortable than coach travel.

Trains fall into two broad classes: InterCity and Regional, which effectively become local commuter services as they approach large cities. There are also a number of special services such as the Airport Express services.

InterCity trains connect the major cities in the UK. These high speed trains generally make limited stops and often have onboard catering facilities but not always. Tickets can be purchased on the day of travel from any station subject to availability but it is best to book as far in advance as possible to secure cheaper seats. When booking in advance a reservation is included in the price. InterCity services can be particularly busy around the Christmas and Easter periods and on Fridays, when reservations are advised.

Regional services usually connect large cities and make multiple stops at intermediate stations. Tickets for one of journeys are usually purchased on the day of travel from the departure station and reservations are not usually available. If a journey is to be repeated daily it is often possible to purchase a season ticket which offers a significant saving compared to the purchase price of individual tickets. These services can be very overcrowded especially during the peak rush hours on journeys into and out of the major cities.

2. Choose the correct answer A, B, C or D.

1. The UK rail network is _____ .
- | | |
|--------------------|-----------------------|
| A. rich | C. poor |
| B. enormous | D. out of date |
2. In the UK railway system there is _____ .
- | | |
|------------------------------------|----------------------------------|
| A. a big variety of tickets | C. no tickets at all |
| B. only 2 types of tickets | D. few samples of tickets |

3. If you are traveling long distances it's better to go _____ .
A. by bus **C.** on foot
B. by coach **D.** by train

4. There are only _____ broad classes of rail service.
A. 3 **C.** 1
B. 2 **D.** none

3. Try to guess the meaning of the following words and word combinations.

- | | |
|-------------------|----------------------------------|
| 1. ticket machine | 5. arrivals and departures board |
| 2. sleeping car | 6. long distance train |
| 3. through train | 7. change of trains, transfer |
| 4. local train | 8. car for non-smokers |

4. Complete the text using the words below.

a	available	by	Economy	fare
hardly	operates	seats	snacks	than

Travelling by Train in Great Britain

British Rail (1)_____ a service of 16.000 trains (2)_____ day serving over 2.000 stations; there's (3)_____ a part of Britain that can't be reached (4)_____ train.

On most trains you have the choice between First and (5)_____ class. First Class (6)_____ are more spacious and cost 50% more (7)_____ the Standard Class (8)_____. Many Intercity trains have a full meals service, and grills, (9)_____ and drinks are also (10)_____ on other trains.

5. Which rail service do the following statements correspond to? Fill in the table.

Connect the main cities, it is overcrowded during rush hours, has catering facilities onboard, doesn't make stops, you can buy season ticket for it, make lots of stops, it's a high speed train, connects large cities, it's better to book tickets in advance for this train, it's busy on Christmas, Easter, Friday; you can't book tickets in advance for this train.

InterCity Train	Regional Train
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	

Text 14. Local Train

It is unlikely that you will need to travel by local train unless you are staying some way out of the centre and are close to a station or wish to visit somewhere on the outskirts where there is a station. If this is the case train travel may be an option worth considering although you are likely to need to connect with other forms of transport at your destination station. You should purchase tickets for train travel prior to boarding a train where possible. Most stations have a ticket office and those without will have ticket vending machines. Oyster Cards cannot generally be used for payment of train tickets but Travelcards are valid for travel on trains within the zones the Travelcard covers and can be purchased at the station ticket office.

1. Decide whether the following statements are true (T) or false (F).

1. You use train because you live in down town. ()
2. Train is the only way to get to the outskirts. ()
3. You need ticket to get on a train. ()
4. You can buy ticket in the train. ()
5. You cannot use Oyster Card as a way of payment for your train trip. ()
6. You can use Travelcard while traveling by train in any zone. ()

2. What is ticket vending machine? Read the information given below and retell it.

Ticket Vending Machines (TVM) & Validators



It's fast and easy to purchase tickets with ticket vending machines. They have a menu screen similar to an automatic teller machine. That leads you through a series of choices.

1. Select Ticket Type

All Caltrain tickets are available - Monthly, 8-ride, Day Pass, One-way and Zone Upgrade for adults. Two four side halves are dispensed for each 8-ride Ticket. To purchase a youth, senior, disabled or Medicare card holder ticket or pass, press the Eligible Discount button.

2. Select Destination

After choosing your ticket type, select your destination zone. You also may change your starting zone. A zone map is located directly above the visual screen.

3. Select Number of Tickets

To purchase one or more tickets, select the ticket type, then push the appropriate buttons to make your selections. The amount of your purchase will appear on the screen.

4. Purchase Tickets

At this time, you have the option to purchase different types of tickets by pushing

the Additional Transactions button located on the bottom left of the screen. Up to four different ticket types can be purchased in a single transaction. The amount of your purchase is totaled after each selection. When you are ready to complete your transaction, push the Press to Purchase button.

5. Insert Cash, ATM or Credit Card

- **CASH:** Insert *cash* in the slots indicated. The machine accepts all bills up to \$100 and all coins, except pennies and 50-cent pieces. All change, including dollars, is given in coins. The machine can give up to \$19.50 in change.

- **CREDIT/DEBIT or ATM CARD:** Insert *credit, debit* or *ATM bank card* in the slot and follow the instructions on the menu screen. The machine will issue a receipt for credit card transactions. Your tickets change and receipt will fall into the *Ticket/Change* slot at the bottom of the machine.

Cancel your transaction at any time by pushing the *red cancel button* under the menu screen.



Validation

If you purchased an 8-ride Ticket or have a complimentary ticket, you must validate your ticket before boarding the train. Most validators are located next to a TVM.

To validate a ticket, insert the ticket as far as it will go and wait for it to be stamped. It will be time stamped four hours from when you validate it.

8-ride tickets work best if they are kept in good condition.

Call at **1.800.660.4287** for information or to report a problem.

Tickets are not sold onboard trains.

Passengers must have a valid ticket prior to boarding. Conductors and fare inspectors perform random fare checks onboard trains. Passengers without valid tickets are subject to a fine of up to \$250 plus court fees.

3. Test for train crews

Test yourself. Your answers to the questions in this test should be based **only** on the passages provided. You should **not** rely on your knowledge of railroading when answering these questions. Be sure to choose the **single best** answer for each question.

A. Read this passage and answer the questions 1 – 2.

Employees may use hand signals only if all crew members understand the signals. When employees are not giving hand signals, they must not make any gestures or movements that may resemble a hand signal.

Giving Signals. Employees who give signals must:

- ▶ Make sure they can be plainly seen.
- ▶ Give signals clearly so they can be understood.
- ▶ Give signals on the engineer's side of the track when practical.

Signal to Stop. Any object waved violently by any person on or near the track is a signal to stop.

Radio and Voice Communication. Employees may use radio and other means of voice communication to give information when using hand signals is not practical. Employees must make sure crew members:

- ▶ Know which train moves will be made by radio communication.
- ▶ Understand that while using the radio, the engineer will not accept any hand signals, unless they are Stop signals.

1. Where is it preferred that an employee stand when giving hand signals?

- A. Either side of the track is fine.
- B. Opposite the engineer's side of the track is preferred.
- C. Standing in the center of the track.
- D. The engineer's side of the track is preferred.
- E. From behind the train.

2. A man near the track is seen waving his arms wildly above his head. What should the engineer do?

- A. Speed up to get away from the person.
- B. Slow down and radio the dispatcher to report the incident.
- C. Proceed with caution.
- D. Call the local police.
- E. Stop.

B. Read this passage and answer questions 3 – 4.

Special precautions must be made in order to protect the equipment or load when switching the following:

- ▶ Passenger cars.
- ▶ Cabooses.
- ▶ Multilevel loads.
- ▶ Cars containing livestock.
- ▶ Open top loads subject to shifting.

Before switching passenger cars:

- ▶ Couple the air hoses.
- ▶ Fully charge the brake system.
- ▶ Use the automatic brake valve when switching.

When coupling passenger cars:

- ▶ Stop the movement approximately 50 feet before the coupling is made.
- ▶ Have an employee on the ground directing the coupling.
- ▶ Ensure couplers are fully compressed and stretched to ensure that knuckles are locked.

3. Which of the following is necessary before switching passenger equipment?

- A. Couple the air hoses.
- B. Ensure couplers are fully stretched.
- C. Ensure the couplers are fully compressed.

- D. Ensure knuckles are locked.
- E. Have an employee on the ground directing activity.

4. At what distance should all passenger car movement be stopped prior to coupling?
 A. 25 feet B. 50 feet C. 75 feet D. 100 feet E. 50 yards

4. Complete each sentence using the comparative form of the word in the brackets. Use than where necessary.

Today, cities are larger than (**large**) before and of course they are more crowded (**crowd**) too.

Although transport in and around big cities is (1) _____ (**advanced**) in the past, traffic is still problem. Some cities try to find a solution by making the cost of parking (2) _____ (**expensive**). This makes public transport a (3) _____ (**attractive**) option because it is (4) _____ (**cheap**). Many cities are trying to improve their public transport system, with (5) _____ (**reliable**) and (6) _____ (**frequent**) train and buses. This makes it easier for pedestrians to move around the city. It is often (7) _____ (**quick**) to walk than go by car, and it's certainly (8) _____ (**convenient**). So, while life for motorists is (9) _____ (**bad**) before, for pedestrians things are definitely getting (10) _____ (**good**).

Text 15. Suburban EMU CityElephant of SKODA TRANSPORTATION a.s.

Double-deck EMUs CityElephant is intended for fast suburban transport.

Double-deck EMUs CityElephant, made in cooperation of the sister companies ŠKODA TRANSPORTATION and ČKD VAGONKA, are intended for fast suburban transport on the lines electrified by 3 kV DC. They typically consist of motor car, intermediate trailer and driving car.

Carbody is made from large-area aluminium profiles. Motor car undercarriage consists of two bogies, each one with two axles and individual axle drive provided by asynchronous traction motors connected to the doublestar configuration. Traction inverters utilize water-cooled IGBT modules.

The design speed of the vehicle is 160 km/h; the existing type is supplied for a speed of 140 km/h.

Computer control enables consists of up to three multiple units coupled together. According to the track capabilities, the automatic train control system could be used.

Interior fully conforms to the demands of passengers with reduced mobility. Although the CityElephant EMUs are designed as a low-floor vehicles, it is also equipped with lifting ramp in the unit's front area. The 1st class section in the motor car also contributes to overall passenger comfort.

1. Read the following statements and find out if they are true (T) or false (F).

1. This electric motor unit is a double deck electric multiple units operated () in the Czech Republic.

2. It consists mostly of three cars: the power car, the normal car and the () control car.
3. It was manufactured by Škoda Holding. ()
4. Commonly, the train is known as CityElephan. ()

2. Answer the questions below.

1. What is the design of CityElephant?
2. What control system is used in this type of suburban train?
3. Is the travelling in CityElephant comfortable for disable person?
4. Is it a high-speed train?

3. Fill the gaps with the following word combinations given below.

access	compartments	special boarding platform
air-conditioned	demanding travellers	suburban transportation
bicycles	increased capacity	two-storey

The 471 series CityElephant electric units are (1) _____, low-floor sets, which are replacing the suburban trains manufactured in the 60s and 70s. They have change the angle on travel culture in (2) _____ in a significant manner. The units are (3) _____. The entrance area is designed as low-floored with easy (4) _____ for the disabled, old people, mothers with prams or people in wheelchairs. There is also a (5) _____ for them in the train and disabled-access toilets. The (6) _____ have comfortable, modern seating with textile upholstery. The train also offers space for those travelling with (7) _____. Thanks to the (8) _____ of the set in comparison with units from the 60s and 70s, it has also been possible to offer the 1st class travel in part of one carriage for more (9) _____.

Text 16. Trains in Ukraine

Ukrainian train system works pretty well. Trains connect all major Ukrainian cities and little towns on the way, they are quite comfortable and the tickets are cheap.

The 22,3 km of railway track link most Ukrainian cities and towns. International links extend from Kyiv to other CIS and European countries as well. There are direct lines to Poland, Russia, Belarus, Germany, Slovakia, Czech, Hungary, Bulgaria, Austria, Latvia, Yugoslavia, Croatia, Moldova and others.

All rail tracks in the former USSR were built wider than European tracks by about three and a half inches. During The 2nd World War this stopped the German rail cars from crossing the border. So today, when people cross the western borders of Ukraine, the carriage wheels will be adjusted at the border by hoisting each car about ten feet into the air and performing the re-alignment with passengers and everyone

else on board! It's really quite interesting to experience. The re-alignment usually takes two or three hours.

There are 3 different types of tickets.

The 3rd class ticket is called 'placecart'. It includes a bed in a big common carriage with no separate compartments. It's the cheapest ticket.

The 2nd class ticket is called 'compartment'. It's a bed in a separate compartment for 4 persons. Gives you a little bit more privacy and more comfort. Prices are affordable.

The 1st class ticket is called 'SV' (sleeping carriage). It's a two-person compartment with much more comfort. Prices are much higher than a second class.

All three types of tickets mean that passenger get a bed, clean sheets are either included, or a small additional charge. Tea, coffee and other refreshments can be bought from the train conductor. All carriages have toilets.

Riding electric trains, or 'elektrichki' are short-distance trains. People get on any carriage they like and sit anywhere. Seats are usually padded, but wooden benches are sometimes still in use. There is usually a toilet at the end of every few cars. Also, people sometimes smoke at the end of the carriage. A ticket officer comes through and checks tickets. Electric trains often stop for as little as 30 seconds!

Long-distance passenger trains stop for at least two minutes, and usually longer in large cities (10 – 20 minutes). Before the train pulls in, a loudspeaker will announce whether the numbering will be from the front or the tail of the train. Passengers check their carriage number on their tickets and take up position at the approximate location their carriage will stop at.

1. Answer the questions below.

1. What international railway links has Ukraine?
2. What types of train are there in Ukraine?
3. What differences are there between electric and long-distance passenger trains?
4. What other types of train are there in Ukraine?
5. Why do passengers who travel to the Western countries spend two or three hours on the border of Ukraine?

2. Match the words and word combinations with the definitions.

- | | |
|-----------------------------------|--|
| 1. passenger train | A. a railway car where passengers' bags are carried |
| 2. baggage car, luggage van | B. a train that carries passengers |
| 3. bullet train, bullet | C. a passenger train that is ridden primarily by passengers who travel regularly |
| 4. commuter, commuter train | D. a high-speed passenger train |
| 5. couchette | E. public transport provided by a line of railway cars coupled together and drawn by a locomotive |
| 6. carriage, passenger car, coach | F. a compartment on a European passenger train; contains 4 to 6 berths for sleeping |
| 7. railroad train, train | G. a railcar where passengers ride |

3. Fill the gaps with words given below. Make necessary changes. Read the text about travelling by train.

- | | | |
|----------------------------|-----------------------------|------------------------------------|
| A. compartment | G. ticket office | M. carriage |
| B. ticket collector | H. missing the train | N. train schedule |
| C. railway station | I. adult fare | O. buy ticket in advance |
| D. one-way ticket | J. railroad ticket | P. round trip ticket |
| E. return ticket | K. fast train | Q. get in line for a ticket |
| F. passenger train | L. fare | |

Travelling by Train in Ukraine

Many people like to travel by train. Travelling by train is slower than by plane, but it has its advantages. It may be a (1) _____ (швидкий потяг) or a (2) _____ (пасажирський потяг). There is no doubt it's much more convenient to travel by a (3) _____ (швидким потягом), because it does not stop at small (4) _____ (залізничних станціях) and it takes you less time to get to your destination.

If you are going to travel by train you should to (5) _____ (придбати квиток заздалегідь). If you don't want (6) _____ (стояти у черзі за квитком), you can book ticket in advance/ you have to ring up (7) _____ (білетну касу залізничної станції) and they can even send your ticket to your place.

There are different types of (8) _____ (залізничних квитків) in our country such as (9) _____ (квиток в один кінець, квиток у два кінця, зворотній квиток). Student fare and child fare are cheaper than (10) _____ (вартість квитка для дорослого). (11) _____ (вартість подорожі) depends on the distance and type of the train.

On the day of your departure reach the railway station on time to avoid (12) _____ (запізнення на потяг), find (13) _____ (розклад потягів) where there is information what time your train leaves. In some time the loud speaker announces that the train is in and the passengers are invited to take their seats. You find your (14) _____ (вагон) and show your ticket to the (15) _____ (провіднику), enter the corridor and find your (16) _____ (купе) and your berth. It may be a lower berth. It is more comfortable than an upper one. You put your suitcase into a special box under the lower seat.

UNIT TWELVE. UNDERGROUND

Text 17. London Underground

Part 1

The London Underground is a public transport network, composed of electrified

railways (that is, a metro system) that run underground in tunnels in central London and above ground in the city's suburbs. The oldest metropolitan underground network in the world, first operating in 1863, the London Underground is usually referred to as either simply 'the Underground' by Londoners, or (more familiarly) as 'the Tube'.

Since 2003, the Tube has been part of Transport for London (TfL), which also schedules and lets contracts for the famous red double – decker buses. Previously London Transport was the holding company for London Underground.

There are currently 275 open stations and over 253 miles (408 km) of active lines, with three million passenger journeys made each day (927 million journeys made 1999 – 2000; there are a number of stations and tunnels now closed).

Lines on the Underground can be classified into two types: sub-surface and deep level. The sub-surface lines were dug by the cut-and-cover method, with the tracks running about 5 metres below the surface. Trains on the sub-surface lines have the same loading gauge as British mainline trains.

The deep-level or 'tube' lines, bored using a tunnelling shield, run about 20 metres below the surface (although this varies considerably), with each track running in a separate tunnel lined with cast-iron rings. These tunnels can have a diameter as small as 3.56m and the loading gauge is thus considerably smaller than on the sub-surface lines, though standard gauge track is used.

Lines of both types usually emerge onto the surface outside the central area, the exceptions being the Victoria Line which is in tunnel for its entire length save for a maintenance depot, and the Waterloo & City Line which, being very short, has no non-central part and no surface line.

Each station displays the Underground logo containing the station's name in place of the word 'Underground', both at entrances to the station and repeatedly along the station walls so that they can easily be seen by passengers on arriving trains. Many stations' walls are decorated in tile motifs that are unique to the station, such as profiles of Sherlock Holmes' head at the Baker Street station or a cross containing a crown at the King's Cross station.

The London Underground (usually called 'the tube') is the biggest subway system in the world. It is also the fastest way to travel in the city. The network consists of nine major routes, called 'lines'.

People can buy tickets at any underground station, at a ticket office, or from a ticket machine. Some of the ticket machines require exact money. All of the machines display 'Change given' or 'Exact money only' signs. The price of the ticket depends on the length of the trip. The longer the trip, the higher the cost of the ticket.

Trains stop at all stations. On some trains, passengers need to press a button to open doors. Every underground train car has maps that show all the stations on the line you are traveling on. There is a map of the whole underground system in every station. Smoking is not allowed on underground trains or in stations.

1. Read the statements and find out if they are true (T) or false (F).

1. The London Underground runs, as the name implies, all the time () underground.

2. There are more than 275 stations. ()
3. Baker Street station is decorated with profiles of Sherlock Holmes' head. ()
4. The Waterloo & City line is the longest in the system. ()

2. Choose the correct answer A, B, C or D.

1. The sub-surface lines run about _____ .
 A. five metres below the surface C. twenty metres below the surface
 B. fifteen metres below the surface D. twenty five metres below the surface
2. It is estimated that there are _____ .
 A. 927 million passengers per day C. 3 million passengers per day
 B. 1 million passengers per year D. 1 million passengers per day
3. According to the passage, the other name of the subway in London is '_____'.
 A. the subway system C. the lines
 B. the underground D. the tube
4. The phrase 'Exact money only' means _____ .
 A. change is offered C. no coins are accepted
 B. no change is given D. only coins are accepted
5. On some trains, if a passenger wants to get off, he was to _____ .
 A. inform the driver C. show his ticket
 B. press a button D. read a map
6. A map of the whole underground system can be found in _____ .
 A. every train C. some train cars
 B. every station D. some ticket offices
7. This passage mainly tells the reader how _____ .
 A. the London Underground works C. a passenger buys a subway ticket
 B. the London Underground develops D. a passenger travels on subway train

Part 2

The London 'tube', possibly the most famous underground train network in the world, seems to have become a tourist attraction in itself. Many foreign visitors to London not only travel on the network, but also buy T-shirts and posters printed with the famous tube map, with one of the red, white, and blue station signs, or even with the words of one of the loudspeaker messages heard in the tube, 'Mind the gap' (which means passengers getting on and off trains should be careful not to step in the gap between the edge of the train floor and the edge of the platform).

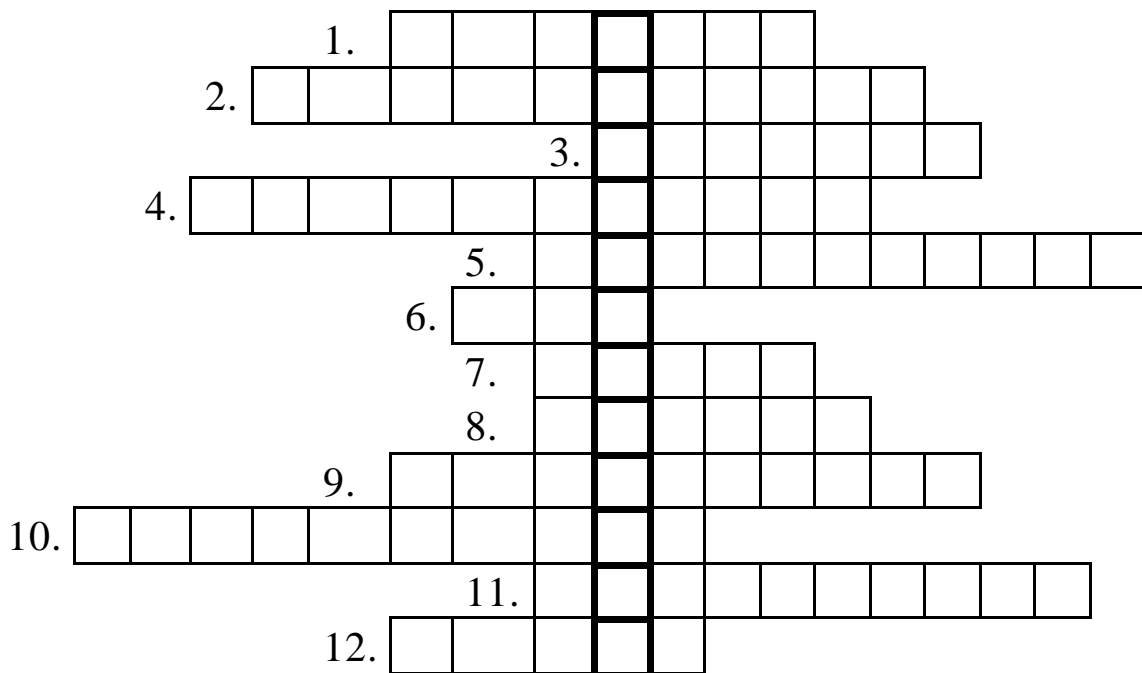
The tube's fame probably has something to do both with its age and its size. It is the oldest underground train network in the world, the first line having been opened in 1863, and many of its 270 stations were built more than 100 years ago. It also has eleven different lines (each with a different color on the map, producing the famous multicolored design) and more kilometers of track (about 400) than any other network in the world.

The name ‘the tube’ comes from the circular shape of many of the underground tunnels, although actually more than half of the network is above ground.

Londoners often grumble about the delays on the tube, the amount of time at weekends when lines are closed due to maintenance work, and the fact that the system doesn’t run 24 hours a day, but instead shuts down from shortly after midnight until about 6:00 a.m. It could be argued, however, that the tube runs pretty well, considering the age of some of its infrastructure, the number of people it has to carry (over a billion passenger journeys a year), and the fact that the lines have only two tracks (one in each direction), which means that when maintenance work needs to be done, there is no alternative track for trains to use.

Though they often wish the tube worked better, it seems Londoners want the famous map to stay exactly as it is. There were complaints recently when Transport for London (TfL), the organization that runs the network, published a new, ‘simpler’ design that did not include the light-blue stripe representing the River Thames. Many people, including the mayor of London, said it was ridiculous for the map not to show whether stations are on the north or the south side of the river. So many people complained that TfL quickly agreed the Thames would be put back on the map as soon as possible.

1. Complete the crossword below. If all the words are correct, the name of the oldest line in the London tube network will read from top to bottom.



1. Many people in London _____ about the way the tube operates.
2. The age of some of the infrastructure, and the fact that the lines have only two tracks, are among the reasons why the tube shuts down so often for _____ work.
3. Many of the tube _____ are circular.
4. The tube is an _____ train network.
5. ‘Mind the gap’ is a well known _____ message on the tube.

6. The tube _____ is multicolored.
7. The tube shuts down for about five or six _____ every night.
8. The tube has _____ lines.
9. The mayor of London thought it was _____ that the new tube map didn't show the River Thames.
10. There were lots of _____ when the new tube map was published.
11. _____ make over a billion journeys per year on the tube.
12. The station _____ are red, white, and blue.

2. Decide if the following statements about the tube are true (T) or false (F), then bet a minimum of 10 points up to a maximum of 50 on your choice.

		T/F	Points bet	Points lost	Points won
1.	British people often refer to the London underground train network as the 'metro'.				
2.	The longest tube line, from the western edge of London to the eastern edge, is more than 50 kilometers long.				
3.	London tube trains have carpet on the floor.				
4.	All tube stations on the same line are at least one kilometer apart.				
5.	There are more than 100 escalators in the tube.				
6.	The total number of tube staff is about one thousand.				
7.	It is illegal to smoke anywhere in the London underground network.				
8.	None of the 270 tube-station names start with a z.				
9.	The newest of the tube's eleven lines is less than 50 years old.				
10.	A new tube line is due to open in east London in 2011 and is going to be called the 'David Beckham Line'.				

Text 18. The Chunnel

Part 1

The Chunnel is a railway tunnel that runs beneath the English Channel, connecting southern England with northern France. Officially called the Channel Tunnel, it is a modern-day wonder of engineering and technology.

Britain and France co-sponsored the project, and work began in 1987. Over 13,000 engineers, technicians, and workers took over 7 years to complete the

Chunnel. Digging started from both ends, using gigantic earth-boring machines. The construction crews met near the middle of the Channel about 3 years later, on December 1, 1990.

Almost 90 acres of dirt and rubble were removed from under the seabed and added to Britain's coastline. A park was built on top of it.

The Chunnel is 31 miles long; 24 miles of this are undersea. On average, it runs 150 feet below the seabed. Its estimated cost was \$21 billion or about \$5 million a day.

It is not a single tunnel, but three separate tunnels (95 miles of tunnels in all). The two larger outside tunnels are for passenger, ferry, or freight trains. Service trains use the smaller middle tunnel, which also provides an escape route in an emergency. Cross-over tracks throughout the tunnel allow trains to move from one track to another. In November 1996, 31 passengers escaped a fire onboard a train through the middle tunnel.

The Chunnel has a passenger rail service that links London with Paris and Brussels. These trains can reach 100 mph during the 20-minute trip through the tunnel. Rail ferry services carry vehicles and their passengers, and freight trains carry cargo or container loads.

The Chunnel opened for business in late 1994. As of 2000, its services had carried 28 million passengers and 12 million tons of freight between England and France.

1. True or False. Read the statements below. If the statement is true, write T beside the sentence. If it is false, write F. If it is false, correct the information.

1. The Chunnel connects northern England and southern France. ()
2. England and France shared the costs of building the Chunnel. ()
3. It took about three years to complete the Chunnel. ()
4. People can drive their cars through the Chunnel. ()
5. The trip through the Chunnel takes about 95 minutes. ()

2. Practice asking and answering the following questions with your partner. Then write the answers in complete sentences.

1. Do you know where the Chunnel is located?
2. Have you ever traveled through an undersea tunnel?
3. Can you guess how much it cost to build the Chunnel?
4. How long do you think it took to build the Chunnel?
5. Do you know the official name for the Chunnel?
6. How much work was involved in building the Chunnel?
7. Where did the digging of the Chunnel begin?
8. What is the length of the Chunnel and how long does it take to travel through it?
9. Which is the smallest tunnel and what is it used for?
10. What did it cost to build the Chunnel and who paid for it?
11. Have there ever been any emergency situations in the Chunnel?
12. How deep is the Chunnel?
13. Can a person travel through the Chunnel with his/her car?

14. Do you think that the building of the Chunnel was worth the huge cost of 21 billion dollars? Explain your answer.
15. What other long undersea tunnels do you know about? How long are they and where are they located?
16. What other modern-day engineering wonders can you think of? Where are they located? Can you think of any ancient engineering wonders that have been built? Describe several of each.
16. If you wanted to travel between England and France with your car, would you prefer to go by ferry boat or use the Chunnel? Explain your answer.

Part 2

The Channel Tunnel (Chunnel) is a rail tunnel beneath the English Channel at the Straits of Dover, connecting Cheriton in Kent, England and Sangatte in northern France. A long-standing and hugely expensive project that saw several false starts, it was finally completed in 1994. It is the second longest rail tunnel in the world, surpassed only by the Seikan Tunnel in Japan. It is operated by Eurotunnel plc.

In 1957 the Channel Tunnel Study Group was formed. It reported in 1960 and recommended a railway tunnel of two main tunnels and a smaller service tunnel. The project was launched in 1973 but folded due to financial problems in 1975 after the construction of a 250 m test tunnel.

In 1984 the idea was relaunched with an Anglo-French government request for proposals to build a privately funded link. Of the four submissions received the one most closely resembling the 1973 plan was chosen and announced on January 20, 1986. The Fixed Link Treaty was signed by the two governments in Canterbury, Kent on February 12, 1986 and ratified in 1987.

The planned route of the tunnel took it from Calais to Folkestone (a route rather longer than the shortest possible crossing) and the tunnel was to follow a single chalk stratum (which meant the tunnel was deeper than the previous attempt). For much of its route, the tunnel is nearly 40 m under the seafloor, with the southern section being deeper than the northern.

Digging the tunnel took 15,000 workers over seven years, with tunnelling operations conducted simultaneously from both ends. The prime contractor for the construction was the Anglo-French TransManche Link, a consortium of 10 construction companies and 5 banks of the two countries. Engineers used large tunnel boring machines (TBMs), mobile excavation factories that combined drilling, material removal, and the process of shoring up the soft and permeable tunnel walls with a concrete liner. After the British and French TBMs had met near the middle, the French TBM was dismantled while the British one was diverted into the rock and abandoned. Almost 4 million cubic metres of chalk were excavated on the English side, much of which was dumped below Shakespeare Cliff near Folkestone to reclaim 90 acres of land from the sea.

The Channel Tunnel consists of three parallel tunnels: two primary rail tunnels, which carry trains north and south, and a smaller access tunnel. This access tunnel, which is served by narrow wheeled vehicles, is interconnected, by means of transverse passages, to the main tunnels at regular intervals. It allows maintenance

workers access to the tunnel complex and provides a safe route for escape during emergencies.

When the two tunnels met 40 m beneath the English Channel seabed on December 1, 1990, in what was to become one of the 'crossover halls' that allow diversion of trains from one main tunnel to the other, it became possible to walk on dry land from Britain to mainland Europe for the first time since the end of the last ice age, over 13,000 years ago. The British and French efforts, which had been guided by laser surveying methods, met with less than 2 cm of error.

The tunnel was officially opened by Queen Elizabeth II and French President Francois Mitterrand in a ceremony held in Calais on May 6, 1994.

1. Read the statements and find out if they are true (T) or false (F).

1. The Channel Tunnel was completed in 1994. ()
2. It took ten years to finish the tunnel. ()
3. The tunnel runs 40m under the sea. ()
4. There are three parallel tunnels inside the Chunnel. ()
5. The tunnels from both ends met in 1990. ()

2. Choose the word(s) with the closest meaning to the underlined words in the following sentences.

1. The tunnel runs beneath the English Channel connecting England and France.
A. between B. under C. across
2. Britain and France co-sponsored the project.
A. supported it together B. built C. designed
3. Gigantic earth-boring machines were used.
A. soil digging B. expensive C. technical
4. The estimated cost of the tunnel was 21 billion dollars.
A. total B. huge C. approximate
5. As of the year 2000, 12 million tons of freight had been carried through the Chunnel.
A. cars B. cargo C. passengers
6. The Chunnel is a modern-day wonder of engineering and technology.
A. building B. tunnel C. a very surprising accomplishment

3. Match the words on the left with the correct meaning on the right.

- A.
- | | |
|-------------|--|
| 1. dig | A. give |
| 2. gigantic | B. car, truck, bus, etc. |
| 3. rubble | C. in or on a ship, train, or airplane |
| 4. ferry | D. connect, join |
| 5. provide | E. make a hole |

- | | |
|---------------|--|
| 6. escape | F. something used for holding or transporting things |
| 7. onboard | G. very large, huge |
| 8. link | H. little bits of broken stones |
| 9. vehicle | I. get free |
| 10. container | J. something that carries people and goods across water |

B.

- | | |
|---------------|---|
| 1. abandon | A. assume control |
| 2. tow | B. movement forward, improvement |
| 3. locomotive | C. reproducing, making more |
| 4. poisonous | D. let water flow away; empty water |
| 5. progress | E. pull |
| 6. swamp | F. an action showing great skill |
| 7. drain | G. part of a canal where the water level changes |
| 8. breeding | H. go away from |
| 9. cruise | I. causing death or injury |
| 10. feat | J. an engine used for pulling |
| 11. take over | K. soft, wet land |
| 12. lock | L. travel by sea |

Text 19. Underground in Kharkiv

On the 15th of June 1968 Kharkiv underground began to build.

On the 23rd of August 1975 the first line of underground (Holodnogirs'ko-zavods'ka) was opened. There were 8 stations there.

In 1984 the second underground line (Saltivs'ka) began to operate.

In 1995 the third underground (Oleksiyivs'ka) line was opened.

It not only helped to solve the transportation problem of our big highly populated city but added naturally to its architectural view.

Today the Kharkiv Metro is an underground line 17.3 kilometres long which crossed the city from West to East and from South to North.

Now the Kharkov underground has 3 lines, 28 working stations, 3 change stations and Moscows'ke and Saltivs'ke depots. The construction of some stations are in perspectives.

Our underground has the first place in people transportation. More than 320 electric cars transport passengers every day.

In conclusion, the electric transport is firmly established in the life of the Kharkovites. It links all parts of city, railway and bus stations, the centre of the city, large industrial and residential areas.

1. Answer the questions below.

1. What are the names of the first stations in Kharkiv Underground?
2. What stations are on the second line?
3. What stations are on the third line?
4. What change stations are in Kharkiv Underground?

5. What stations are in perspectives?

2. Write down a short composition about Kharkiv Underground using the following information.

Underground in Kharkiv

Lines and Stations	Name	Opened	Length	Stations
1	Kholodnohirsko-Zavodska Line	1975	17.3 km	13
2	Saltivska Line	1984	10.3 km	8
3	Oleksiiivska Line	1995	7.9 km	7
	Total:		35.4km	28

23 Aug 1975	Kholodna Gora (formerly Vul. Sverdlova) – Moskovs'kyi prospekt	
23 Aug 1978	Moskovs'kyi prospekt – Proletars'ka	
11 Aug 1984	Istorychnyi Muzei – Barabashova	7.7 km
26 Oct 1986	Barabashova – Heroiv Pratsi	
06 May 1995	Metrobudivnykiv – Naukova	
21 Aug 2004	Naukova – 23rd Serpnia	2.6 km

Number of escalators – 47

Number of depots – 2

The deepest station – Pushkinska

The station with the longest stage – Kievska – Akademika Barabashova (2407m)

The station with the shortest stage – Atchitector Beketov – Derzprom (771m)

Text 20. Kiev Underground

1. Put the following passages into the right order to make up a story about Kiev Underground.

_____ The construction of the second line began in the early 1970s and the first three stations were opened in 1976. It was Kurenivsko-Chervonoarmiyska Line what continued expanding. In 1982 it reached Obolon, the largest residential district, in the northern Kiev. At the same time the construction continued to the southwest of the city and new stations were added in 1981 and 1984.

_____ The third, Syretsko-Pecherska Line began to build in 1981. The first three station segment opened in 1989 in the centralpart of Kiev. Following a northwest-southeast axis, in 1991 it continued up to the left bank of the Dnieper and by 1992 crossed the river and continued into the rapidly developing Poznyaky and Kharkivsky residential districts which it reached in 1994. In mid late 1990s construction began on expansion to the Syrets district in the northwest direction with stations opening in 1996, 2000 and 2004. Some of the intermediate stations were deliberately left unfinished and opened later: Pecherska (1997) and Vyrlytsia (2006).

_____ After the Bolshevik victory in the Civil War, Kiev became a provincial city and no large scale proposals to improve the city were drawn. In 20 years all this changed when in 1934, the capital of the USSR was moved to Kiev. In 1936 the presidium of the Kiev Municipal Soviet analysed the first report by the Moscow Institute for Transport Engineering proposing an underground system for the reconstruction of the new capital.

_____ Following the terrible destruction suffered by the city in the war, a massive reconstruction was opened for the capital of the third largest city in the USSR. This time the Metro was in the plan and construction began in August 1949. Eleven years later the first 5.2 kilometre segment from the Vokzalna to Dnipro.

_____ Like all Metro systems in the former Soviet Union which are known for their vivid and colourful decorations, Kiev's is no exception. The original stations of the first stage are elaborately decorated, showing the postwar Stalinist architecture blended with traditional Ukrainian motifs. However as the stations were built in a time when the richly decorated Stalinist feature was already seen as nothing but an extra, the stations of the second stage that opened in 1963 had an ascetic and strict appearance. Functionality became the most important factor in the new designs, and stations built at that time were almost identical save the design of tile patterns and pillar riveting material. Only in the 1970s did decorative architecture start to make a rapid recovery. The stations built from the 1980s onwards show more innovative design comparing with the stations in other cities in former USSR.

_____ Presently, there are 46 stations of which almost half are deep level and the rest sub-surface. The former comprise 20 stations, of which 15 are of pylon type, 3 are of column type, and 2 stations are wall-columned. Of the 20 sub-surface stations, 12 stations are of pillar-trispan type, two are side-platform pillar bi-spans, 5 more are single-vaults, and a further one is an asymmetrical double deck trispan. In addition, 6 stations are located above ground, of which four are surface level, and two are flyover. Most of the stations have large vestibules, some on surface level whilst others are underground interlinked with subways.

_____ Some of the older stations have undergone upgrades to lighting and renovation of some decorative material. After the declaration of Ukrainian independence following the breakup of the Soviet Union in 1991, some of the Soviet symbols originally incorporated into decor were adapted to modern times or removed altogether by altering architectural composition of those stations, making them lose some of their original splendour.

1 . The Kiev Metro is the first rapid transit system in Ukraine and the third one built in the USSR (after Moscow and St. Petersburg). It has three lines of overall length 56.6 kilometres and 46 stations. One of the deepest stations in the world, Arsenalna at 102 metres, is found on the system. The metro follows a standard Soviet triangle three line, six radii layout that intersects in the centre where the stations are built very deep underground and could potentially double as bomb shelters.

_____ The story for a rapid transit system in Kiev originates back to 1916 when businessmen of the Russo-American trading corporation attempted to collect funds to sponsor construction of a metro in Kiev, which previously has been a

pioneering city for Imperial Russian rapid transit, like opening of the first Russian tram system. After the downfall of the Tsarist government Hetman Skoropadsky was also much interested in building the system, but after the downfall of the Hetmanate in the autumn of 1918 Ukraine plunged into chaos of Civil War and the project was shelved for good.

_____ Those five stations formed the central part of what is today known as the Sviatoshynsko-Brovarska Line, which runs from the west to the east of the city. The line crossed the Dnieper river in 1965 across a newly constructed Metro Bridge and went east to the large residential areas being built on the left bank of the river, with subsequent extensions in 1968 and 1971. At the same time it extended to Kiev's westernmost residential areas of Sviatoshyn and Bilychi in three stages 1963, 1971 and 2003.

2. Translate the information about Kiev Underground Rolling Stock.

На момент відкриття Київського метрополітену, 6 листопада 1960 року, промисловістю серійно випускалися вагони типу Д. Їх парк у 1960 –61 році становив 24 вагони, в 1963 році – 39. З 1964 року Митищинський машинобудівний завод припинив випуск вагонів цього типу. У 1969 році всі вагони цього типу передані Ленінградському метрополітену для укомплектування лінії зі станціями типу «горизонтальний ліфт». Натомість Київський метрополітен отримав 39 вагонів типу Е. Зараз у Києві є тільки три вагони Д. Один з них обладнується як музей, ще один є колієвимірювальною лабораторією. З третього вагона зробили контактано-акумуляторний електровоз.

Новий тип вагонів «Славутич» є спільним виробництвом ЗАТ «Вагонмаш» Санкт-Петербург, «Шкода» Чехія та ДП «Київський метрополітен». Новий поїзд оснащений асинхронними тяговими двигунами, діяльність всього рухомого складу контролюється комп'ютерами. Склад складається з п'яти вагонів – два головних, два проміжних і один причіпний.

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НАВЧАЛЬНЕ ВИДАННЯ

MEANS OF TRANSPORTATION. Збірник текстів і завдань з дисципліни 'Іноземна мова (за професійним спрямуванням)' (англійська мова) (для організації самостійної роботи студентів 2 курсу денної форм навчання напрямку 6.050702 'Електромеханіка').

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