МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ
ХАРКІВСЬКА НАЦІОНАЛЬНА АКАДЕМІЯ
МІСЬКОГО ГОСПОДАРСТВА

МЕТОДИЧНІ ВКАЗІВКИ

до виконання самостійної та контрольної роботи

з дисципліни

“ІНОЗЕМНА МОВА ПРОФЕСІЙНОГО СПРЯМУВАННЯ”

(АНГЛІЙСЬКА МОВА)

(для студентів 1 курсу заочної форми навчання
освітньо-кваліфікаційного рівня бакалавр напряму підготовки
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Методичні вказівки до виконання самостійної та контрольної роботи з дисципліни ”Іноземна мова професійного спрямування ” (англійська мова) для студентів 1 курсу заочної форми навчання напряму 6.080101 «Геодезія, картографія та землеустрій»./ Харк. нац. акад. міськ. госп-ва; уклад.: А. М. Крохмаль. – Х.: ХНАМГ, 2011. - 51с.

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Методичні вказівки до виконання самостійної та контрольної роботи відповідають змісту програми учбової дисципліни “Іноземна мова (за професійним спрямуванням)” та націлені на формування навичок практичного володіння англійською мовою в обсязі загальної тематики необхідної для комунікативної спроможності в сферах професійного та ситуативного спілкування.

Рекомендовано для студентів 1 курсу заочної форми навчання.

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Методичні рекомендації для студентів

Перед тим як виконувати контрольну роботу студенту необхідно докладно вивчити граматичний матеріал, для чого надається список рекомендованих джерел з граматики англійської мови. Перекладаючи текст, слід користуватися англо-українським словником.

Роботи студентів повинні відповідати наступним вимогам:

а) перша сторінка зошита залишається вільною для рецензії викладача. У зошиті повинні бути поля для зауважень та рекомендацій рецензентів;

б) вся контрольна робота виконується в зошиті в *лінію*;

в) завдання (Tasks) переписуються в зошит; завдання (Tasks) перекладати рідною мовою не потрібно;

г) матеріал контрольної роботи слід розміщати у зошиті за наступним зразком:

Текст на англійській мові	Текст на рідній мові	Поля

д) виконуючи лексико-граматичні завдання кожне речення потрібно переписувати у зошит та перекладати на рідну мову;

е) перекладаючи *текст* з англійської мови на рідну, кожне речення слід писати *з нового рядка*: речення на англійській мові – з лівої сторони, а переклад – з правої сторони сторінки зошита.

Перевірена контрольна робота повинна бути виправлена студентом згідно з вказівками рецензента, а недостатньо засвоєні теми семестру слід проробити додатково перед усним заліком.

Якщо контрольна робота виконана без дотримання вказівок чи не повністю, вона повертається студенту без перевірки.

Студенти, які не захистили контрольну роботу, не допускаються до заліку (чи до екзамену) за відповідний навчальний період.

Номер варіанта, який виконує студент заочного відділення, визначається за останньою цифрою номера залікової книжки: 1, 2 – ***варіант 1***; 3, 4 – ***варіант 2***; 5, 6 – ***варіант 3***; 7, 8 – ***варіант 4***; 9, 0 – ***варіант 5.***

Приклад оформлення контрольної роботи:

Контрольна робота № … варіант .....

з дисципліни …….

……(англійська мова)

студента заочної форми навчання ……. курсу

спеціальності .....

……...

(прізвище, ім'я та по батькові)

шифр залікової книжки .....

Контрольне завдання 1

Для того, щоб вірно виконати контрольне завдання **1**, необхідно засвоїти наступний граматичний матеріал:

1. Іменник. Множина. Артиклі та прийменники як показники іменника. Висловлювання відмінкових відносин у англійській мові за допомогою прийменників та закінчення ***'s.*** Іменник в функції означення та його переклад на рідну мову.
2. Прикметник. Ступені порівняння прикметників. Конструкція типу ***the more…the less; as…as; not so…as.***
3. Числівники: кількісні, порядкові, вживання артикля з числівниками.
4. Займенники: особові, питальні, вказівні, неозначені та заперечні.
5. Видо-часові форми дієслова: Indefinite (Present, Past, Future) у дійсному стані. Відмінювання дієслів ***to be, to have*** в Indefinite (Present, Past, Future). Наказовий спосіб та його заперечна форма.
6. Просте поширене речення: порядок слів розповідного, спонукального, питального та заперечного речення. Зворот ***there + to be.***

Варіант 1

Task 1. Fill in the gaps with the correct adjectives in comparative and superlative form and underline them. Translate the sentences into your native language.

1. In the _____ papers, articles, or book chapters, the authors had to write for an audience that would be unfamiliar with the language and concepts under discussion. *(old)*
2. It is the _____ and is used more in geodesy than in GIS and cartography.
3. *(accurate)*
4. The metric system is far _____ to use for GIS work. *(easy)*
5. These operations would be much _____ if we could encode the numbers in binary. *(fast)*
6. The _____ formats included ASCII files of ***(x, y)*** coordinates. *(early)*

Task 2. Put the verbs in brackets into the correct tense form (Present Indefinite, Past Indefinite, Future Indefinite) and underline them. Translate the sentences into your native language.

1. Jack Estes and Jeffrey Star _____a GIS as ‘an information system that is designed to work with data referenced by spatial or geographic coordinates. *(define)*
2. The GIS often _____ check plots to be generated that simply plot the label or identification number of the key within a polygon or next to a line. *(allow)*
3. Converting maps into numbers _____ that we choose a standard way to encode locations on the earth. *(require)*
4. The transverse Mercator projection, in various forms, _____ part of the civilian UTM system. *(be)*
5. Goodchild _____ geographic information science as ‘the generic issues that surround the use of GIS technology, impede its successful implementation, or emerge from an understanding of its potential capabilities.’*(define)*

Task 3. Complete the sentences with the following words:

user construction university easy country
technical aspect factor training trade-off

1. We offer free _____ support for those buying our software.
2. The closure of mine was the single most important _____ in the town's decline.
3. Please enter your _____ user name.
4. Few candidates had received any _____ in management.
5. He didn't make it _____ for me to leave.
6. There is a _____ between the benefits of the drug and the risk of side effects.
7. Work has been begun on the _____ of the new airport.
8. She didn't know what life in a foreign _____ would be like.
9. This was one _____ of her character he didn't see before.
10. Is there a _____ in this town?

Task 4. Read the text. Give the written translation of the paragraphs into your native language.

In this chapter we look at the various ways that maps can he represented using numbers. All GISs have to store digital maps somehow. As we will see, there are some critical differences in how the various types of GIS navigate on this ocean of geographic numbers. The organization of the map into digits has a major impact on how we capture, store, and use the man data in a GIS. There are many ways that the conversion of a visual or printed map to a set of digits can be done. Over the years, the designers of GIS and computer mapping packages have devised an amazing number of ways that maps can be converted into numbers. The difference between the ways is not trivial, not only because different types of files and codes are needed,

but because the entire way that we think about the data in a GIS is affected. The link between how we imagine the features that we are working with in the GIS and the actual tiles of bytes and bits inside the computer is a critical one. To the computer, the data are stored in physical structure. The physical structure is not only how computer memory, such as disk and RAM is used, but also how the files and directories store and access the map and attribute information.

On the physical level, the map, just like the attributes, is eventually broken down into a sequence of numbers, and these numbers are stored in the computer's files. In general, two alternative ways exist of storing the numbers. In the first each number is saved in the file encoded into binary digits or bits.

The second way of encoding numbers into files is to treat each number the way that humans do – one decimal digit at a time.

Task 5. Answer the questions on the text in writing. Be ready to discuss them.

1. What do geographic numbers represent ?
2. What is converted into a set of digits ?
3. What two alternative ways of storing numbers exist ?

Task 6. Read the text . Decide whether the statements are true (T) or false(F).

FINGING DATA ON THE NETWORKS

An excellent way to begin a data search is to use a computer network. Several computer packages allow you to do this over the various network access methods, such as America Online and CompuServe. The most sophisticated tools, however, are those available on the Internet. Among the various tools, such as Archie, Veronica, WAIS, and Gopher, is a computer program called Mosaic, from the National Supercomputing Center at the University of Illinois. Mosaic allows you to search the World Wide Web (WWW), an interlinked set of computers and servers, or data repositories on the Internet. Similar and more widely used programmes are Netscape Navigator and Microsoft Explorer. Each major agency has a World Wide Web server,

or ***gateway,*** through which data can be searched and downloaded. Simply enormous amounts of data are available through this simple mechanism.

1. Existing map data are used in a map library. ( )
2. A data search is provided by various network access methods. ( )
3. The Internet is of great help in finding data. ( )
4. Mosaic is an interlinked set of computers and servers. ( )
5. We search data through a World Wide Web server but download the data through a simple mechanism. ( )

Task 7. Read the following text. Find the English equivalents to the terms given below.

Many of the principles of the new geographic information science have been around for quite some time. General-purpose maps date back centuries and usually focused on topography, the lay of the land, and transportation features such as roads and rivers. More recently, in the last century, thematic maps came into use. Thematic maps contain information about a specific subject or a theme, such as surface geology, land use, soils, political units, and data collection areas. Although both types of maps are used in GIS, it is the thematic map that led cartography toward GIS. Some themes on maps are clearly linked. For example, a map of vegetation is closely tied to a map of soils.

1. путь перевозки _____
2. определенный объект _____
3. карта почв _____
4. карта растительной жизни _____
5. карта общего назначения _____
6. тематическая карта _____

Task 8. Translate the following sentences into English.

1. Во многих ГИС используется много разных форматов и одна структура данных.
2. Если ГИС представляет (supports) много разных структур данных, то ответственность за изменения структур несет пользователь.
3. Процесс замены вектора на растр - несложный, процесс замены растра на вектор – сложный.
4. Часто происходит либо обмен данными, либо передача данных в разные пакеты ГИС или между компьютерными системами.
5. Для будущего ГИС важное значение имеет эффективный обмен данными

Варіант 2

Task 1. Fill in the gaps with the correct adjectives in comparative and superlative form and underline them. Translate the sentences into your native language.

1. The advantage of having a topologically consistent map is that when two or maps must be overlain, much of the initial preparation work has been done. *(many)*
2. The _____ tools, however, are those available on the Internet. *(sophisticated)*
3. Similar and _____ used programmes are Netscape Navigator and Microsoft Explorer. *(widely)*
4. _____, the method of geocoding stamps its form onto the data in such a way that many other GIS operations are affected afterwards. *(important)*
5. The _____ edge, which will have the cursor and your right sleeve dragged over it many times, should be taped over its entire length. *(low)*

Task 2. Put the verbs in brackets into the correct tense form (Present Indefinite, Past Indefinite, Future Indefinite) and underline them. Translate the sentences into your native language.

1. An estimate of the ellipsoid _____ calculation of the elevation of every point on earth, including sea level, and is often called a datum. *(allow)*
2. Most _____ that the functions fall into categories and that the categories are subtasks that are arranged sequentially as data move from the information source to a map and then to the GIS user and decision maker. *(agree)*
3. More recently, in the last century, thematic maps _____ into use. *(come)*
4. The amount of information available about GIS _____ somewhat overwhelming. *(be)*
5. Some libraries _____ facilities to connect to network search systems and even specialized staff with training in geographic information.*(have)*

Task 3. Complete the sentences with the following words:

contiguous features relation properties analysis
data pattern enquiry scale area

1. Both plans are drawn to the same _____.
2. This _____ was collected from 69 countries.
3. Scientific _____ is a very important process.
4. Compare the physical _____ of the two substances.
5. The software has no particular distinguishing _____.
6. This system sets the _____ for others to follow.
7. The two countries are _____.
8. There is heavy traffic in the downtown _____ tonight.
9. The book is an _____ of poverty and its causes.
10. The fee they are offering bears no _____ to the amount of work involved.

Task 4. Read the text. Give the written translation of the paragraphs into your native language.

Maps have at least two dimensions; in the earth's space they have latitude and longitude and in the map's space they have the left-right (*x)* and the up-down (*y*) directions. They are also scaled-down representations of features, features that can be points, lines, areas, or even volumes. Point features are very simple to deal with, and you could easily argue that you don't really even need a GIS for point features other than to draw them. This is because ***x*** and ***y*** can be stored just as regular attributes in a standard database. Line and area features are more complicated because they can be different shapes and sizes. A stream and a road would be captured with different numbers of points, and these would not fit easily into the attribute database.

Vector data structures were the first to be used for computer cartography and GIS because they were simply derived from digitizing tablets, because they are more exact in representing complex features such as land parcels, and because they are easily drawn on pen-type output devices such as plotters. Surprisingly, few people in the early days thought of standardizing how digitizing was to take place, and since there were different technologies, many different formats evolved. The earliest included ASCII files of (***x, y)*** coordinates, but these soon became very unwieldy in size, so binary files rapidly took over.

The first generation of vector files were simply lines, with arbitrary starting and ending points, which duplicated the way a cartographer would draw a map. Obviously the pen would be lifted from the paper to start a new line, but it could be lifted anywhere else. The file could consist of a few long lines, many short lines, or even a mix of the two. Typically, the files were written in binary or ASCII and used a flag or code coordinate to signify the end of a line.

Task 5. Answer the questions on the text in writing. Be ready to discuss them.

1. How many dimensions does a map have ?
2. What structures were the fist to be used in computer cartography ?
3. What did the first generation of vector files consist of ?

Task 6. Read the text . Decide whether the statements are true (T) or false(F).

SOURCES OF INFORMATION ON GIS

Historically, GIS has been a somewhat disjoint field from a reader's standpoint, and most of the major books, journals, and online resources date from only the last few years. This is far less an issue today, however, and there are now some excellent sources of GIS information. These fall into groups and are covered here under journals and magazines, books, professional societies, the Internet and the World Wide Web, GIS conferences, and educational organizations and universities.

The amount of information available about GIS is somewhat overwhelming. An excellent place to begin one's search is at a library, or perhaps by connecting to the Internet and using one of the World Wide Web search tools. This is possible even at one's home computer, but slow enough that a visit to the library may be more productive. Some libraries have facilities to connect to network search systems and even specialized staff with training in geographic information.

As in our definition of geographic information science, the information sources on GIS fall into the broad categories of research with GIS and research on GIS. As a beginner, try restricting your search to basic material rather than going straight to the research frontier. This can come later. A good way to research a topic is to find publications that came out at about the time a new idea was being introduced. In the older papers, articles, or book chapters, the authors had to write for an audience that would be unfamiliar with the language and concepts under discussion. This is the case in several classic papers in the GIS arena. The writing remains today as a good first step toward understanding and an excellent place to get started with GIS.

1. Most of sources of information on GIS are known from the ancient times. ( )
2. Only a few sources of information on GIS are known nowadays. ( )
3. The Internet is the most productive way to find geographic information. ( )
4. The information sources on GIS have two categories of research. ( )
5. It is advisable to begin the research of geographic information with the reading of familiar publications. ( )

Task 7. Read the following text. Find the English equivalents to the terms given below.

THE SHAPE OF THE EARTH

The satellite era has brought with it more accurate means of measurement, including the global positioning system (GPS). An estimate of the ellipsoid allows calculation of the elevation of every point on earth, including sea level, and is often called a ***datum.*** Recent datums have been calculated using the centre of the earth as a reference point instead of a point on the ground as was the case before.

MAP SCALE

All maps, whether on a sheet of paper or inside a computer, are reductions in size of the earth. A map at one-to-one scale (**1**:1) would be virtually useless; you would barely be able to unfold it. In cartography, the term representative fraction is used for the amount of scaling. A representative fraction is the ratio of distances on the map to the same distances on the ground.

MAP PROJECTIONS

Given that the earth can be approximated by a shape like the sphere or the ellipsoid, how can we go about converting data in latitude and longitude into a flat map, with ***x*** and ***y*** axes ? The simplest way is to ignore the fact that latitude and longitude are angles at the centre of the earth, and just pretend that they are ***x*** and ***y*** values.

1. средства измерения, контроля _____
2. последняя исходная величин _____
3. точка отсчета, ориентир _____
4. уменьшение размера _____
5. масштаб 1:1 _____
6. приблизительно _____

Task 8. Translate the following sentences into English.

1. Данные для ГИС можно

а. купить.

б. найти в цифровом виде в существующих источниках.

в. собрать (capture) по аналоговым картам путем геокодирования.

2. Геокодирование – это преобразование пространственной (spatial)информации в цифровую форму.
3. Геокодирование включает в себя сбор (capturing) данных по карте и нахождение атрибутов.
4. Данные, имеющиеся на существующих картах, можно найти в библиотеке карт, через поисковую сеть (network searches), либо на носителях информации, например, на CD-ROM или дисках.
5. Большинство провайдеров обеспечивают доступ к информации через всемирную сеть.

Варіант 3

Task 1. Fill in the gaps with the correct adjectives in comparative and superlative form and underline them. Translate the sentences into your native language.

1. The satellite era has brought with it _____means of measurement, including the global positioning system. *(accurate)*
2. _____ people think of maps as drawings on paper. *(many)*
3. The computer can only decide two things: Is one number _____than another? Are two numbers equal? *(little)*
4. Second-generation computers were _____ than first-generation ones. *(small)*
5. Second-generation computers are controlled by integrated circuits and are consequently _____. *(dependable)*

Task 2. Put the verbs in brackets into the correct tense form (Present Indefinite, Past Indefinite, Future Indefinite) and underline them. Translate the sentences into your native language.

1. Goodchild also _____ that this involved both research on GIS and research with GIS. *(note)*
2. An excellent place to begin one's search _____ at a library, or perhaps by connecting to the Internet. *(be)*
3. The information sources on GIS _____ into the broad categories of research with GIS and research on GIS. *(fall)*
4. A good way to research a topic is to find publications that out at about the time a new idea was being introduced.*(come)*
5. Information _____ our society, but fortunately, it takes on only a few tangible forms. *(permeate)*

Task 3. Complete the sentences with the following words:

congress program purchased software package history background specific philosophy survey sophisticated

1. The system came with a database _____.
2. This international _____ was very interesting.
3. Geological techniques are becoming more _____ all the time.
4. The equipment can be _____ from your local supplier.
5. Her _____ of life is to take every opportunity that presents itself.
6. Load the _____ into the computer.
7. Many people throughout _____ have dreamt of a world without war.
8. The money was collected for a _____ purpose.
9. Can you give me more _____ on the company's financial position?
10. First of all you must do a geological_____.

Task 4. Read the text. Give the written translation of the paragraphs into your native language.

With a 30-year history and with so many alternative ways to structure map and attribute data, it is hardly surprising that most GISs use radically different approaches to handling their content. The data structures used are often invisible as far as the GIS user is concerned. We might not even need to understand exactly what is happening

when two maps are overlain. However, if we are to be objective, we must have a full understanding of the errors and transformations involved. Regardless of how a GIS structures its maps as numbers, it must be able to import data from other GIS packages and from the most common data sources, as well as scanned and digitized data, and to convert the result into its own internal format. In some cases this is an open process. Some GIS companies have published and documented their internal or exchange data formats, including Intergraph and Autodesk. Others protect their internal data as a trade secret, in the hope of being able to sell data and data converters as well as their GIS.

The most common data formats for GIS data have been used by so many GIS operations and for so much existing data that a GIS ignores them at its peril. Some are so common that utility programmes and even operating systems read, process, and display these formats automatically. These formats include some that have arisen because they are a common data format, such as TIGER and DLG. Others are industry-standard formats, proprietary formats that have been used so much that they are documented and published, although their use may have restrictions.

In the GIS world, a small subset of these formats has become commonplace.

Task 5. Answer the questions on the text in writing. Be ready to discuss them.

1. What for must we understand the errors and transformations involved in the GIS structures ?
2. Why isn't the process of data converting open for some GIS companies ?
3. Why does a GIS ignore the most common data formats ?

Task 6. Read the text . Decide whether the statements are true (T) or false(F).

The database management system's (DBMS's) heritage is from within computer science, but the user community is as broad as that of GIS, literally millions of firms, accountants, colleges and universities, banks, and so forth that need to keep and organize records by computer. The earliest database management systems date from the efforts of the early 1970s, when large mainframe computers were used, data-entry

was by key punch and punched cards, and the technology was called automatic data processing.

The parts of a DBMS have remained fairly consistent over time, regardless of how the attribute data are actually placed into files. The data definition language is that part of the DBMS that allows the user to set up a new database, to specify how many attributes there will be, what the types and lengths or numerical ranges of each attribute will be, and how much editing the user is allowed to do. This establishes the data dictionary, a catalog of all of the attributes with their legal values and ranges. Every DBMS has the ability to examine the data dictionary, and the data dictionary itself is a critical piece of metadata (data about the data) that is often required when the database has to move between systems.

The most basic management function is data entry, and because most entry of attribute data is fairly monotonous and may be by transcription from paper records, the DBMS's data-entry system should be able to enforce the ranges and limits entered into the data dictionary by the data definition language. For example, if an attribute is to contain a percentage, and the data-entry person types a value of "110", the DBMS should refuse to accept the value and alert the person.

1 .The user community that needs to keep and organize records by computer is broad. ( )

2. In the times of the earliest database management the data were processed automatically. ( )

3. The data definition language is an important part of the database management system. ( )

4. The data dictionary is an important part of metadata. ( )

5. The data-entry system limits the data definition language. ( )

Task 7. Read the following text. Find the English equivalents to the terms given below.

Using maps within GISs means that somehow they have already been turned from real into virtual maps. Another way to say this is that a paper map has gone through a conversion, from a paper or analog form into a digital or number form. We start with paper, or sometimes film, Mylar, or some other medium, and we end up with a set of numbers inside files in the computer. This conversion process is called ***geocoding,*** which we can define as the conversion of spatial information into computer-readable form. Some GIS vendors would be pleased to help you acquire the data you need but at an immense price. Studies have shown that finding the right maps, and converting these maps from real to virtual form by geocoding, takes up anywhere between 60% and 90% of both the time and money spent on a typical GIS project. Fortunately, this is a once-only cost. As soon as we have the map in a digital form, we can use it in a GIS over and over again for different uses and projects unless it needs an update.

1. претерпели преобразование _____
2. (майларовая) пленка _____
3. пространственная информация _____
4. считываемый компьютером _____
5. огромная цена _____
6. единоразовые затраты _____

Task 8. Translate the following sentences into English.

1. Карты могут быть представлены цифрами.
2. В этом случае визуальная или печатная карта преобразуется в систему бинарных или десятичных цифр.
3. В компьютерной картографии и ГИС картографические данные вносятся в растровый или векторный формат
4. В модели растровых данных используется координатная сетка с системой координат.

5. Векторный формат представлен точками координат.

Варіант 4

Task 1. Fill in the gaps with the correct adjectives in comparative and superlative form and underline them. Translate the sentences into your native language.

1. In _____ cases, the medium we use is paper. *(many)*
2. Second-generation computers were _____ than first-generation ones. *(fast)*
3. Second-generation computers are controlled by integrated circuits and are consequently _____. *(small)*
4. This is possible even at one's home computer, but slow enough that a visit to the library may be _____ . *(productive)*
5. In the _____ papers, articles, or book chapters, the authors had to write for an audience that would be unfamiliar with the language and concepts under discussion. *(old)*

Task 2. Put the verbs in brackets into the correct tense form (Present Indefinite, Past Indefinite, Future Indefinite) and underline them. Translate the sentences into your native language.

1. **T**he power of the GIS _____ in allowing the attribute and the geographic or map information to be linked together in a useful way. *(be)*
2. Most maps in GIS _____between 1: 1,000,000 and 1 : 1,000. *(fall)*
3. A line longitude _____ from the north pole to the south pole and is called a meridian. *(run)*
4. The zero-longitude meridian is called the prime meridian and through Greenwich, England. *(pass)*
5. Converting maps into numbers _____ that we choose a standard way to encode locations on the earth. *(require)*

Task 3. Complete the sentences with the following words:

storage project exchangeable added minor
metadata batching macros address matching microcomputer

1. These may be some _____ changes to the schedule.
2. You must know everything about the _____ and retrieval of in formation.
3. We use these languages which are usually command-line programs or _____.
4. My friend has a _____.
5. These tokens are _____ for CD's and cassettes only.
6. You need set up a _____ to computerize the library system.
7. The GIS interface is tedious without some way of _____commands.
8. A new wing was _____ to the building.
9. _____ a mailing list would convert the mailing of characteristics of the places on the list.
10. _____ usually includes the date, source, map projection etc. as well as data about the format and structure of the data set.

Task 4. Read the text. Give the written translation of the paragraphs into your native language.

Most people think of maps as drawings on paper. Maps hang on walls, lie in map drawers, and fill the pages of books, atlases, street guides, newspapers, and magazines. Maps roll off the nation's printing presses in the millions each year, and they fill the spaces in every car's glove compartment, neatly folded or not! The traditional paper maps of our everyday world can be called real maps, because they are touchable. We can hold them in our hands, fold them up, and carry them around. The computer, in contrast, has forced us to reconsider this simple definition of a map. In the digital era, and especially within GISs, maps can be both real and virtual.

A virtual map is a map waiting to be drawn. It is an arrangement of information inside the computer in such a way that we can use the GIS to generate the map however and whenever we need it. We may have stored map information about roads,

rivers, and forests, for example, but may decide that only the forests and rivers need be shown on any map that the GIS produces. Every real map is simply a conversion of the virtual map into a medium, the form that the map will take. In most cases, the medium we use is paper.

Task 5. Answer the questions on the text in writing. Be ready to discuss them.

1. What do we call a real map ?
2. What is a virtual map ?
3. What is the medium for both types of maps ?

Task 6. Read the text . Decide whether the statements are true (T) or false(F).

THE UNIVERSAL TRANSVERSE MERCATOR COORDINATE SYSTEM

The UTM coordinate system is commonly used in GIS because it has been included since the late 1950s on most USGS topographic maps. The choice of the transverse Mercator, probably now used more than any other projection for accurate mapping, has an interesting history. The story begins with the observation that the equatorial Mercator projection, which distorts areas so much at the poles, nevertheless produces minimal distortion laterally along the equator.

The transverse Mercator projection, in various forms, is part of the civilian UTM system described here, the state plane system, and the military grid. It has been used for mapping most of the United States, many other countries, and even the planet Mars. The first version is the civilian UTM grid, used by the U.S. Geological Survey on its maps since 1977, and marked on many maps since the 1940s as blue tic marks along the edges of the quadrangle maps or grids over the surface. In 1977 the transverse Mercator projection replaced the polyconic for large-scale U.S. mapping.

1. The UTM coordinate system has been excluded from most topographic maps. ( )
2. The transverse Mercator projection is a kind of a coordinate system. ( )
3. The transverse Mercator projection provides accurate mapping. ( )
4. The transverse Mercator projection maximizes distortions at the poles. ( )

5. It is used mainly for bigger than usual maps. ( )

Task 7. Read the following text. Find the English equivalents to the terms given below.

DIGITIZING

Geocoding by tracing over a map with a cursor is sometimes called semiautomated digitizing. This is because in addition to using a mechanical device, it involves a human operator. Digitizing means the use of a digitizer or digitizing tablet (Figure 4). This technology has developed as computer mapping and computer-aided design have grown and placed new demands on computer hardware.

The digitizing tablet is a digital and electronic equivalent of the drafting table. The major components are a flat surface, to which a map is usually taped, and a stylus or cursor, with the capability of signaling to a computer that a point has been selected (Figure 4). The mechanism to capture the location of the point can differ. Many systems have connected arms, but most have embedded active wires in the tablet surface that receive an electrical impulse sent by a coil in the cursor. In some rare cases, the cursor transmits a sound, which is picked up and recorded by an array of microphones.

1. чертежный стол _____
2. устройство преобразования в цифровую форму_____
3. цифровой преобразователь графической информации

_____
4. манипулятор _____
5. поверхность _____
6. встраивать _____

Task 8. Translate the following sentences into English.

1. Географическая информация включает в себя такие параметры как объём, размерность (dimensionality) и непрерывность.

2. Простые географические признаки могут быть использованы для создания (build) более сложных параметров.

3. Участки строятся с помощью линий, состоящих из точек, представленных координатами.

4. Все географические признаки включают в себя размер, распределение (distribution), рисунок, целостность (continuity), район, форму, масштаб и координаты.

5. Большая часть анализа ГИС и представления (description) состоит из изучения свойств географических признаков и в определении связи между ними.

Варіант 5

Task 1. Fill in the gaps with the correct adjectives in comparative and superlative form and underline them. Translate the sentences into your native language.

1. The computer can only decide two things: Is one number _____than another? Are two numbers equal? *(great)*
2. Second-generation computers were _____ than first-generation ones. *(dependable)*
3. Fourth-generation computers are 50 times _____than third-generation computers. *(fast)*
4. It is a little _____ than it first seems, but with a little digression, we can quickly come up to speed, and even be experts. *(complex)*
5. The metric system is far _____ to use for GIS work. *(easy)*

Task 2. Put the verbs in brackets into the correct tense form (Present Indefinite, Past Indefinite, Future Indefinite) and underline them. Translate the sentences into your native language.

1. A computer plotter or a printer can understand the dimensions also, and usually that the locations be given in ***(x, y)*** format. *(require)*

2. The vector and the raster formats often _____ similar GIS data in very different ways. *(store)*
3. The GIS software _____ one of two strategies for dealing with the two types of data. *(adopt)*
4. Some systems _____ only one format exclusively, and provide utilities or import options to bring in and convert the data to the format to be used. *(use)*
5. The story _____ with the observation that the equatorial Mercator projection, which distorts areas so much at the poles. *(begin)*

Task 3. Complete the sentences with the following words:

focus choice example vectors system intuitive meaningless process automated engineering

1. The entire manufacturing process has been _____.
2. He had an _____ sense of what the reader wanted.
3. Can you give me an _____ of what you mean?
4. The British educational _____ is very popular all over the world.
5. It was the main _____ of attention at the meeting.
6. We are in the _____ of selling our house.
7. The bridge is a triumph of modern _____.
8. We fill up our lives with _____ tasks.
9. Acceleration and velocity are both _____.
10. We are faced with a difficult _____.

Task 4. Read the text. Give the written translation of the paragraphs into your native language.

Geocoding is the part of GIS data input that results in getting a map into the computer. It is not the entire story, however, for as yet we have not dealt with getting the attributes into the GIS. An attribute is a value, usually a number, containing information about the features contained in the GIS. If the feature we are geocoding is a road, for example, then capturing the route of the road from a map as it winds

from intersection to intersection is pure geocoding. We also have to tell the computer what this long and winding line is: a road, and anything else that the GIS needs to know about it. Relevant attributes for a road might be its state route number, the year it was built, what the surface is made of, how many traffic lanes are on the road, if the road is one-way or two-way, how many bridges it goes over, how many cars travel along the road per hour, and so on. These values are the road's ***attributes***. They are the very meat and potatoes of GIS analysis.

Somehow, we have to get them into the computer, too.

Task 5. Answer the questions on the text in writing. Be ready to discuss them.

1. What does getting the map into the computer result from ?
2. What is an attribute ?
3. What is necessary for GIS analysis ?

Task 6. Read the text . Decide whether the statements are true (T) or false(F).

Key elements in raster data are shown in Figure 1. First, the cell size determines the resolution of the data, and the cell size has both a map and a ground expression. We often talk about 30-meter Landsat data, for example, meaning that each cell in the data is 30 meters by 30 meters on the ground. On the map, we may use several pixels to display the grid cell, or on paper we may use a dot of a certain size in a given colour. Second, the grid has an *extent,* often rectangular since a grid has columns and rows, and even if we do not wish to store data in the GIS for grid cells outside our region (such as a state), we still have to place something (usually a code for 'outside') in the grid cells. Third, when we map features onto the grid there is sometimes an imperfect fit. Lines have uneven widths, points must be moved to the centre or the intersection points of the grid, and areas may need to have their edges coded separately. We sometimes have to determine in advance what connections within the grid are legal. For example, taking a single cell, we can allow connections only north, south, east, and west, like the way a rook moves in chess, or we can allow diagonal connections as well. Which we choose can mean a great deal as to how the GIS

works at storing and using the features. Fourth, when we deal with a grid, each grid cell can usually only be ‘owned’ by one feature, that is, the one whose attribute it holds. In many cases, map data are not so simple. Soils, for example, are often listed by their percentage of sand, silt, and clay at every point. Finally, when we have a grid every cell in the grid has to be made big enough to hold the largest value of the attribute or index to be stored in the grid. You may have had the experience of using a spreadsheet or table to store people’s names. Even when we store ‘Jane Doe’ with only eight characters, we still have to allow for the occasional very long name. Every grid cell pays the storage penalty of the extra space, and with the total number of cells being the product of the numbers of rows and columns, the amount of space needed can add up (or rather multiply up) quickly. Storage sizes for grids often increase by powers of 2 as more and more ‘bytes’ of 8 bits are needed to store larger and larger values.

Nevertheless, raster grids have many advantages. They are easy to understand, capable of rapid retrieval and analysis, and are easy to draw on the screen and on computer devices that display pixels.

1. The cell size has a map or a ground expression. ( )
2. We use many pixels to display the grid cell. ( )
3. The features mapped onto the grid are always perfect. ( )
4. Sometimes, map data are not so simple. ( )
5. The largest value of the attribute or index can be held in the cells of any size. ( )

Task 7. Read the following text. Find the English equivalents to the terms given below.

SCANNING

The second digitizing process is automated digitizing or more usually, just scanning. The scanner you may have seen at a computer store or in an advertisement,

or perhaps the one you use for scanning documents, is a desktop scanner. The drum scanner is most commonly used for maps. This type of scanner receives an entire sheet map, usually clamped to a rotating drum, and scans the map with very fine increments of distance, measuring the amount of light reflected by the map when it is illuminated, with either a spot light source or a laser. The finer the resolution, the higher the cost and the larger the data sets. A major difference with this type of digitizing is that lines, features, text, and so on, are scanned at their actual width and must be preprocessed for the computer to recognize specific cartographic objects. Some plotters can double as scanners, and vice versa.

For scanning, maps should be clean and free of folds and marks. Usually, the scanned maps are not the paper products but the film negatives, Mylar separations, or the scribed materials that were used in the map production. An alternative scanner is the automatic line follower, a scanner that is manually moved to a line and then left to follow the line automatically. Automatic line followers are used primarily for continuous lines, such as contours. These and other scanners are very useful in CADD (computer-aided drafting and design) systems, where input from engineering drawings and sketches is common.

1. настольный сканер _____
2. барабанный сканер _____
3. шаг, увеличение _____
4. местный (локальный) источник света _____
5. графопостроитель _____
6. увеличивать в два раза _____

Task 8. Translate the following sentences into English.

1. Наука о географии основывается на знаниях картографии, компьютерной техники и математики.
2. ГИС состоит по меньшей мере из базы данных и картографической информации, связанных между собой средствами компьютерной техники.
3. Наука о географической информации касается многих аспектов современной

жизни.

4. ГИС берет свое начало в тематической картографии.
5. ГИС – это бизнес, оцениваемый многими миллионами долларов.

Контрольне завдання 2

Для того, щоб виконати контрольне завдання **2**, необхідно повторити наступні розділи курсу англійської мови:

1. Часи дієслова:
   а) активний стан – форми Indefinite (Present, Past, Future), форми Continuous (Present, Past, Future), форми Perfect (Present, Past, Future);
   б) пасивний стан – форми Indefinite (Present, Past, Future). Особливості перекладу пасивних конструкцій на рідну мову.
2. Прості неособові форми дієслова: Participle I (Present Participle), Particip1 (Past Participle), у функціях означення та обставини, Gerund – герундій, прості форми.
3. Модальні дієслова ***can, must, may, should*** та еквівалентні їм конструкції ***to be able, to have to.***
4. Неозначені займенники.

Варіант 1

Task 1. Put the verbs in brackets into the correct tense. Underline the predicate and translate the sentences into your native language.

1. Information _____ (permeate) our society, but fortunately, it _____ (take) on only a few tangible forms.
2. In 1952, a major computing company _____ (take) a decision to get out of the business of making mainframe computers.
3. The history of the multi-billion dollar PC industry _____ (be) one of mistakes.

4. Many people doing research on GIS _____ (argue) that defining GIS narrowly, as a technology, as software, or as a science.
5. An ellipsoid _____ (give) the base elevation for mapping, called a datum.

Task 2. Translate the sentences into your native language. Put questions to the underlined parts of the statements.

1. Many colleges and universities teach classes in GIS, and some offer complete programmes with course sequences and certificates.
2. Within universities and colleges, GIS classes are taught in many departments.
3. Without the preordering of information, much of it would not be usable by humans in their everyday lives.
4. Converting maps into numbers requires that we choose a standard way to encode locations on the earth.
5. Map data could be structured in raster or vector format.

Task 3. Read and translate key terms and their definitions into your native language.

feature: A single entity that makes up part of a landscape.

file: Data logically stored together at one location on the storage mechanism of a computer.

format: The specific organization of a digital record.

fourth dimension: A common way of referring to time; the first three dimensions determine location in space, the fourth dimension determines creation, duration, and destruction in time.

functional definition: Definition of a system by what it does rather than what it is.

Task 4. Using hints in brackets, complete the following sentences with modals (*can, must, may, should*) or modal constructions (*to be able to, to have to*) and underline them. Translate the sentences into your native language.

1. If we want to write a book, we _____ visit a computer store and buy a word processing package in a box to install on our computer.
2. Supporting the science are the uniqueness of geographic data, a distinct set of pertinent research questions that _____ only be asked geographically.
3. In geography, a social science tradition _____ some extent an antipathy toward technological approaches.
4. A link to the earth _____ vsomehow be placed into the GIS database.
5. We _____ refer to the data by the location—and the location by the data.

Task 5. Read the text and give the written translation of paragraphs 1, 2 into your native language.

A GIS can be seen as a set of tools for analyzing spatial data. These are, of course, computer tools, and a GIS can then be thought of as a software package containing the elements necessary for working with spatial data. If we want to write a book, we might visit a computer store and buy a word processing package in a box to install on our computer. Similarly, if we seek to work with spatial data, one definition of a GIS is the software in the box that gives us the geographic capabilities we need.

If a GIS is a toolbox, a logical question is 'What types of tools does the box contain?' Several authors have tried to define a GIS in terms of what it does, offering a functional definition of GIS. Most agree that the functions fall into categories and that the categories are subtasks that are arranged sequentially as data move from the information source to a map and then to the GIS user and decision maker. Another GIS definition, for example, states that GISs are 'automated systems for the capture, storage, retrieval, analysis, and display of spatial data.' This has been called a 'process definition' because we start with the tasks closest to the collection of data_and end with tasks that analyse and interpret the information.

Jack Estes and Jeffrey Star defined a GIS as 'an information system that is

designed to work with data referenced by spatial or geographic coordinates. In other words, a GIS is both a database system with specific capabilities for spatially-referenced data, as well as a set of operations for working with the data.'

Ken Dueker defined a GIS as 'a special case of information systems where the database consists of observations on spatially distributed features, activities or events, which are definable in space as points, lines, or areas. A geographic information system manipulates data about these points, lines, and areas to retrieve data for ad hoc queries and analyses.'

Task 6. Answer the following questions to the text given above.

1. What packages are discussed in Text A ?
2. What is a GIS as a toolbox used for?
3. What does Jack Estes's definition of a GIS differ from Ken Dueker's definition of a GIS in ?

Task 7. Fill in the gaps with the prepositions from the box.

from for (2) by (2) with (2) of (3)

WHY TOPOLOGY MATTERS

When topological data structures became widespread in GIS, some significant benefits resulted, enough that today the vector arc/node data structure (1)___ topology probably is the most widespread (2)___ GIS data. Typically, a GIS maintains the arc as the basic unit, storing (3)___ it the polygon left and right, the forward and reverse arc linkages, and the arc end nodes (4)___ testing. This means that each line is stored only once and that the only duplication is the endpoints. The disadvantage is that whenever areas or polygons are to be used, some recomputing is necessary. Most programmes save the result, however, such as the computed polygon areas, so that recalculation is unnecessary.

Topology allowed GIS for the first time to do error detection. If a set (5)___ polygons is fully connected, and there are no gaps at nodes or breaks in the lines defining the areas, the set (6)___ areas is called ***topologically clean***. When maps are first digitized, however, this is rarely the case. The topology can be used to check the polygons. Polygon interiors are usually identified (7)___ digitizing a point inside a polygon, a label point, and (8)___ keeping track of the arcs as they are entered. A polygon gets the label from the label point when the point is found to be inside the polygon. A GIS will have the ability to build the topology (10)___ the unconnected arcs. First, each endpoint is examined to see if it is 'close' to another. If it is, the points are 'snapped' together; that is, their (***x. y***) coordinates are averaged and each is replaced with exactly the same values.

Task 8. Translate the following sentences into English.

1. Примером поиска по атрибутам является обнаружение (find) и просмотр (browse).
2. Компьютер позволяет создавать новые атрибуты на основе рассмотренных (calculated) значений.
3. В базе данных карты информация (records) представлена пространственными объектами (features).
4. Пространственные эквиваленты запросов(queries) в системе управления базой
   данных помогают определять местоположение(location) пространственных объектов.
5. Запрос в ГИС обычно осуществляется по командной строке(command line), выбранному пакету (batch) или макрокоманде (macro).

Варіант 2

Task 1. Put the verbs in brackets into the correct tense. Underline the predicate and translate the sentences into your native language.

1. GIS (Geographical Information Systems) _____ (begin) to make a serious impact outside academic circles in Ireland in the late-1990s.
2. In 1977 the transverse Mercator projection _____ (replace) the polyconic for large-scale U.S. mapping.
3. As we _____ (see), there are some critical differences in how the various types of GIS navigate on this ocean of geographic numbers.
4. Over the years, the designers of GIS and computer mapping packages _____ (devise) an amazing number of ways that maps can be converted into numbers.
5. The link between how we imagine the features that we _____ (work) with in the GIS and the actual tiles of bytes and bits inside the computer is a critical one.

Task 2. Translate the sentences into your native language. Put questions to the underlined parts of the statements.

1. No national body as yet certifies people in GIS, but some vendors offer certification as instructors.
2. Most information is usually preordered into lists, numbers, tables, text, pictures, maps, or indexes.
3. When data are entered into the computer, we store them as files and refer to them collectively as database.
4. Maps on common coordinate systems are automatically aligned with each other.
5. During the early days of GIS, several systems evolved different versions of the structure.

Task 3. Read and translate key terms and their definitions into your native language.

line feature: A geographic feature recorded on a map as a sequence of locations tracing out a line.. An example is a stream.

point feature: A geographic feature recorded on a map as a location. Example: a single house.

search engine: A software tool designed to search the Internet and the WWW for documents meeting the user's query. Examples: Yahoo and Alta Vista.

software package: A computer program application.

spatial data: Data that can be linked to locations in geographic space, usually via features on a map.

Task 4. Using hints in brackets, complete the following sentences with modals (*can, must, may, should*) or modal constructions (*to be able to, to have to*) and underline them. Translate the sentences into your native language.

1. Locations on the paper _____ be given in map millimeters or inches starting at the lower left-hand corner.
2. A computer plotter or a printer _____ understand these dimensions also, and usually requires that the locations be given in (x, y) format.
3. Attributes _____ be dates, standardized values, or field or other measurements.
4. When we capture a map into the raster data model, we _____ assign a value to every cell in the grid.
5. The value we assign _____be the actual number from the map such as the terrain elevation in a digital elevation model

Task 5. Read the text and give the written translation of paragraphs 1, 2 and 3 into your native language.

A GIS can answer the two questions: "what?" and "where'.'" More important, a GIS answers the question "What is where?" The where component relates to the map behind all GIS activities. The what relates to the features, their size, geographical properties and above all else, their attributes. Getting this information is what the toolbox definition of GIS meant by retrieval.

These are not trivial questions. Other forms of data organization often fall apart when dealing with ‘where.’ The telephone book, for example, a list organized alphabetically by last name, gives only relative locations (street addresses) and a house number. An entirely new directory is necessary for each new district, and to retrieve the telephone number of a friend in another town, perhaps just across the river, becomes a major problem because you require a different telephone directory than the one covering your own neighborhood.

The properties of geographic search, finding all the phone numbers of people on a single city block, for example, are not available easily to the user of a telephone directory. The secret to data retrieval, the ability to gain access to a record and its attributes on demand, is in data organization.

At the logical level, access requires a data model, a theoretical construct that becomes the key for unlocking the data's door.

Without such a data model, data cannot be searched or extracted and therefore become worthless.

We can define a data model, then, as a logical construct for the storage and retrieval of information. It is the computer's way of memorizing all the GIS data that we need to use. This is different from the data structures we examined in earlier, because these deal primarily with how the data are physically stored in files on the computer system. As we have seen, this means that a GIS must have at least two data models, and that the two must have a bridge or link between them to tie the attributes and the geography together. These are the map data model and the attribute data model.

Task 6. Answer the following questions to the text given above.

1. What do the questions ‘What’ and ‘Where’ relate to ?
2. What is the secret to data retrieval ?
3. What is the key to searching and extracting the information ?

Task 7. Fill in the gaps with the prepositions from the box.

of (3) in (4) at on for with

The other major type (1)___ data model for map data is the vector. The vector is composed (2)___ points, each one represented by an exact spatial coordinate. For a point or a set of points, vectors just use a list of coordinates. For a line, we use a sequence (3)___ coordinates; that is, the sequence of points in the list is the order (4)___ which they must be drawn on the map or used in calculations. Note that this gives lines a 'direction' (5)___ which their points should be read. Areas (6)___ the vector model are the space enclosed by a surrounding ring of lines, either one or several of them.

Vectors are obviously very good (7)___ representing features that are shown (8)___ maps as lines, such as rivers, highways, and boundaries. Unlike the raster grid, where we have to store a grid cell's attribute whether we need it or not we need only place points precisely where we need them. A square can be four lines connecting four points, for example. Even wiggly lines can be captured quite well (9)___ this way, by using more points (10)___ the bends and fewer when the line is straight.

Task 8. Translate the following sentences into English.

1. ГИС может ответить на вопрос "Что где находится?"

2. Многие формы организации данных не подвластны (incapable of) географическому исследованию.

3. Модель представления данных является логической структурой (construct) для хранения и восстановления информации.

5. Реляционная база данных основана (based on) на множественных плоских файлах для записи данных, содержащих разнородные (непохожие) атрибутивные структуры, связанные общим (key) атрибутом.

Варіант 3

Task 1. Put the verbs in brackets into the correct tense. Underline the predicate and translate the sentences into your native language.

1. Historically, GIS _____ (be) a somewhat disjoint field from a reader's standpoint, and most of the major books, journals, and online resources date from only the last few years.
2. In general, two alternative ways _____ (exist) of storing the numbers.
3. It is the logical structure of the data that _____ (require) us to have a mental 'model' of how the physical data represent a geographic feature.
4. Traditionally in GIS and computer cartography, there _____ (be) two basic types of data model for map data and only one for attribute data.
5. A raster data model _____ (use) a grid, such as the grid formed on a map by the coordinate system, as its model or structure to hold the map data.

Task 2. Translate the sentences into your native language. Put questions to the underlined parts of the statements.

1. Some universities and extension services offer short courses.
2. In database language, the items that we gather information about are referred to as attributes and individual data items as records.
3. Map scale is based on the representative fraction, the ratio of a distance on the map to the same distance on the ground.
4. Converting maps into numbers requires that we choose a standard way to encode locations on the earth.
5. Locations on the paper can be given in map millimeters or inches starting at the lower left-hand corner.

Task 3. Read and translate key terms and their definitions into your native language.

***vector*:** A map data structure using the point or node and the connecting segment as the basic building block for representing geographic features.

***grid cell*:** A single cell in a rectangular grid.

line: A one-dimensional (length) map feature represented by a string of connected coordinates.

point: A zero-dimensional map feature, such as a single elevation mark as specified by at least two coordinates.

***volume*:** A three-dimensional (volume) feature represented by a set of areas enclosing part of a surface, in GIS usually the top only.

Task 4. Using hints in brackets, complete the following sentences with modals (*can, must, may, should*) or modal constructions (*to be able to, to have to*) and underline them. Translate the sentences into your native language.

1. The values _____ somehow link the data in the flat file to the data in the map.
2. We _____ store index numbers in the grid and any number of attributes for the index numbers in the flat file.
3. Point data are simple; we _____ even put the coordinates in the flat file itself.
4. For each record we _____ write the ASCII codes for the values in each attribute in a consistent way.
5. The file then _____ be a sort of table or matrix with rows and columns.

Task 5. Read the text and give the written translation of paragraphs 1 and 2 into your native language.

In general, 'technology' is the relationship that society has with its tools and crafts, and to what extent society can control its environment. The Merriam-Webster dictionary offers a definition of the term: 'the practical application of knowledge especially in a particular area' and 'a capability given by the practical application of knowledge'. Technology is a term with origins in the Greek 'technologia', 'τεχνολογία' – 'techne', 'τέχνη' ('craft') and 'logia', 'λογία' ('saying').

The history of technology is at least as old as humankind, if not older. The human race's use of technology began with the conversion of plentiful natural resources into simple tools. The prehistoric discovery of the ability to control fire increased the available sources of food, and the invention of the wheel helped humans in travelling in and controlling their environment. Recent technological developments, including the printing press and the Internet, have lessened physical barriers to communication and allowed humans to interact on a global scale. However, not all technology has been used for peaceful purposes; the development of weapons of ever-increasing destructive power has progressed throughout history, from clubs to nuclear weapons.

Technology has affected society and its surroundings in a number of ways. In many societies, technology has helped develop more advanced economies (including today's global economy). However, many technological processes produce unwanted by-products, known as pollution, and deplete natural resources, to the detriment of the Earth and its environment. Various implementations of technology influence the values of a society and new technology raises new ethical questions. Philosophical debates have arisen over the present and future use of technology in society, with disagreements over whether technology improves the human condition or worsens it.

Task 6. Answer the following questions to the text given above.

1. What is the origin of the term ‘technology’?
2. What were the first examples of technology use?
3. How did recent technological developments change people’s life?

Task 7. Fill in the text with the proper prepositions.

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VECTOR DATA FORMATS

A general distinction between industry and commonly used standards (1)___ GIS data is that between formats that preserve and use the actual ground coordinates (2)___ the data and those that use an alternative ***page coordinate description*** (3)___ the map. The latter are the coordinates used when a map is being drafted (4)___ display in a computer mapping programme or (5) _____the data display module (6)___ a GIS.

The Hewlett-Packard Graphics Language (HPGL) is a page description language designed (7)___ use with plotters and printers. The format is simple and the files are plain ASCII text. Each line (8)___ the file contains one move command, so a line segment connects two successful lines or points. The format works (9)___ minimum of header information, so that files can be written or edited easily. However, the header can be manipulated to change the scaling, size, colours and so (10)____. The HPGL is an unstructured format and does not store or use topology.

Task 8. Translate the following sentences into English.

1.Система базы данных содержит модуль описания данных (data definition module), который устанавливает ограничения (constraints on) целостности на атрибутивные значения.
2. Система также содержит модуль для ввода (entry) и коррекции данных, а также систему управления (management) для хранения и поиска (выборки) (retrieval) данных.
3. Проверка и контроль данных для карт осуществляется с помощью топологии.
4. За ошибки в картах и атрибутивных данных несет ответственность лицо, составляющее эти данные (data producer), и пользователь ГИС должен понимать это.
5. Точность и четкость карт (precision map) и атрибутивных данных в ГИС оказывают влияние на другие операции, в частности, сравнение по масштабу (across scales).

Варіант 4

Task 1. Put the verbs in brackets into the correct tense. Underline the predicate and translate the sentences into your native language.

1. If you get a magnifying glass and look at a monitor or a television set, you _____ (***see***) that the picture is made from thousands of the tiny pixels.
2. When we _____ (***capture***) a map into the raster data model, we have to assign a value to every cell in the grid.
3. The cell size _____ (***determine***) the resolution of the data, and the cell size has both a map and a ground expression.
4. Since geographic information systems came into common use in the early 1980s, more and more people _____ (***use***) computers to get detailed.
5. At first, some very early GIS packages _____ (***require***) maps to be encoded and entered by hand.

Task 2. Translate the sentences into your native language. Put questions to the underlined parts of the statements.

1. Most of the major GIS vendors offer short training programmes lasting anywhere from a few hours at a national or regional conference to several days or weeks.
2. Computer science can have a much closer relationship with mathematics than many scientific disciplines.
3. A basic difference between these types of information and the information that is collected into geographic information systems is that GIS information has associated with it an underlying geography.
4. Most information is usually preordered into lists, numbers, tables, text, pictures, maps, or indexes.
5. The power of the GIS is in allowing the attribute and the geographic or map information to be linked together in a useful way.

Task 3. Read and translate key terms and their definitions into your native language.

attribute: A numerical entry that reflects a measurement or value for a feature. Attributes can be labels, categories, or numbers; they can be dates, standardized values, or field or other measurements. An item for which data are collected and organized. A column in a table or data file.

cartography: The science that deals with the principles, construction, and use of maps.

data: A set of measurements or other values, such as text for at least one attribute and at least one record.

database: A collection of data organized in a systematic way to provide access on demand.

file: Data logically stored together at one location on the storage mechanism of computer.

Task 4. Using hints in brackets, complete the following sentences with modals (*can, must, may, should*) or modal constructions (*to be able to, to have to*) and underline them. Translate the sentences into your native language.

1. We can do the same for an area, except that we need the line flat file as well to refer to in the polygon or area file
2. We _____ update programs to keep pace with constantly changing knowledge and techniques.
3. Programs _____ be written once and not change for generations.
4. We are not sure, but the Internet access _____ be given to everyone in the irm, despite concerns that employees will waste time on the Web.
5. If we wanted a particular record, we could search line by line until we found the correct one and then print it.

Task 5. Read the text and give the written translation of paragraphs 1, 2 and 3 into your native language.

Most GIS systems include as part of the package a fairly basic relational database manager, or simply build on the existing capabilities of a database system. Searches by attribute then are controlled by the capability of the database manager. All DBMSs include functions for basic data display; that is, show all attributes in a database, show all records with their attributes, and show all existing databases. Most also allow records to be output in a standard form, with a particular page layout and style, called a report generator. If we need a paper copy of the database, perhaps for checking and verification, then the report generator is used.

As far as actually doing retrieval is concerned, the DBMS must support functions that fall into the category of query. As we have seen, a DBMS should allow sufficient data query that any record can be isolated and any subset required for mapping found easily. We may also sometimes wish to reorder or renumber an attribute.

A find is the most basic attribute search. Find is usually intended to get a single record. We might find record 15, for example. Finding can be by search or by browse. Browse searches record by record, displaying each, until the user finds the one needed. Sorting can sort alphabetically for a field, or numerically for a number. Note that a sort may or may not deal with missing values, and where it places them may be significant.

A restrict operation allows the user to retrieve a subset of the total number of records by placing a restriction on the attributes' values. For example, we could restrict a search to all records with a date more recent than 1/1/99, or to cities with a population of more than 100,000 people. A select operation allows us to choose what attributes will be taken out from another database to form a new database with fewer 'selected' attributes. We usually do this to join these records and attributes onto another database in the relational system. A compute operation allows us to compute a value for an attribute, to assign a value, or to do mathematical operations between attributes - divide one by another, for example. We can also usually renumber an attribute, that is, change the values to our specifications. We might want to find all percentages in an attribute and change them to a zero if they fall below 50% or a one if they are greater, so that we can do a binary combination with another.

Task 6. Answer the following questions to the text given above.

1. What is the function of a database manager in a GIS ?
2. What is the difference between a find and a query ?
3. What other operations does a user do during o search by attribute ?

Task 7. Fill in the gaps with the prepositions from the box.

of-3 from to-3 in into with

One means (1)_____ map overlay is to intersect all (2)_____ the layers involved to generate a set of most common geographic units (3)_____ map algebra, the raster plays this role. The attributes are then inherited or passed down (4) _____ subsetted areas, and the attribute table gets longer and longer as more and more units are created. We have already seen the many problems (5)____vector map overlay, including sliver polygons. Blind map overlay will happily assign attributes (6)_____ very small sliver polygons, and use them in further analysis. A solution (7)_____this problem is to first process each layer to reduce the number (8) _____ solution classes that will find their way (9)_____ the final map. A selective query (10) _____each layer is one simple way to do this.

Task 8. Translate the following sentences into English.

1. Метод геокодирования может влиять на построение карты (structure) и повлечь за собой ошибки, связанные с пространственной информацией.
2. Двумя основными методами геокодирования являются преобразование в цифровую форму и сканирование.
3. При преобразовании в цифровую форму данные снимаются (capture) с карты путем отслеживания (tracing) линий вручную.
4. При сканировании карта размещается (place) на стеклянной плоскости (plate), которая освещается лучом света.
5. Для сканирования важны размер изображения и разрешение (resolution).

Варіант 5

Task 1. Put the verbs in brackets into the correct tense. Underline the predicate and translate the sentences into your native language.

1. The computer revolution _____ (***be***) the fastest growing technology in man's history.
2. Educational software _____ (***become***) more useful and interesting to students as graphics and video are incorporated.
3. It _____ (***take***) several more years of development before expert systems are in widespread use.
4. Two technologies _____ (***evolve***) to get maps into the computer.
5. At present many advances in the science of computer design and technology _____ (***come***) together to enable the creation of fifth-generation computers.

Task 2. Translate the sentences into your native language. Put questions to the underlined parts of the statements.

1. A surprising number of today's popular computer languages have actually been around since the 1950s.
2. COBOL was developed in 1960 by a joint committee to produce applications for the business world and had the novice approach of separating the data descriptions from the actual program.
3. The Internet keeps getting bigger and bigger all the time with more than 2 million people joining every month.
4. The Pentium, introduced in 1993, allowed for more high-tech programs, sound, pictures, a better Internet experience.
5. During the twenty-first century, it is clear that computers will continue to play an increasingly central role in supporting the testing, and even formulation of scientific hypotheses.

Task 3. Read and translate key terms and their definitions into your native language.

geocode: A location in geographic space converted into computer-readable form.

latitude: The angle made between the equator, the earth's geometric center, and a point on or above the surface. The south pole has latitude – 90 degrees, the north +90 degrees.

level of measurement: The degree of subjectivity associated with a measurement. Measurements can be nominal, ordinal, interval, or ratio.

link: The part or structure of a database that physically connects geographic information with attribute information for the same features. Such a link is a defining component of a G1S.

location: A position on the earth's surface or in geographic space definable by coordinates or some other referencing system, such as a street address or space indexing system.

Task 4. Using hints in brackets, complete the following sentences with modals (*can, must, may, should*) or modal constructions (*to be able to, to have to*) and underline them. Translate the sentences into your native language.

1. FORTRAN, developed by a team of IBM programmers, was one of the first high-level languages in which the programmer does not _____ deal with the machine code of 0s and 1s.
2. The Internet was made so you _____ learn, explore and have fun.
3. Computers _____ be found at school, in libraries, and at most places of work and play.
4. For the Internet to continue to be effective and efficient in delivering current information into the classroom, schools _____ incorporate clear goals, objectives, and long-term strategic plans to create the best method of delivering of the information to teachers and students.
5. One _____ not conclude that the Internet has now finished changing.

Task 5. Read the text and give the written translation of paragraphs 1, 2 into your native language.

Computers are part of our everyday lives. They have an effect on almost everything you do. When you buy groceries at a supermarket, a computer is used with laser and barcode technology to scan the price of each item and present a total. Barcoding items (clothes, food and books) require a computer to generate the barcode labels and maintain the inventory. Most television advertisements and many films use graphics produced by a computer. In hospitals, beside terminals connected to the hospital's main equipment, computer allow doctors to type in orders for blood tests and to schedule operations. Banks use computers to look after their customers' money. In libraries and bookshops, computers can help you to find the book you want as quickly as possible.

The Internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location.

Electronic Learning or e-Learning is reinventing the way people learn. The desk, the chalkboard, the paper and pencil, and the knowledge-giver no longer dominate the classroom. The Internet is the biggest influence. When delivered via the Internet, the vendors' curricula can personalize learning. Any student can use the computer as a medium through which the access of information and resources manifest itself as the supernatural agency.

One of the fascinating and important sociological questions surrounding computerization is the extent to which the use of computer-based systems really transforms any part of the social order. It is a fundamental question, since social studies of technology gain their public value by shedding light on the consequences of social group's using various technologies. Whether and how the widespread use of computer-based systems transform parts of the social order are just two of the fascinating questions about the social consequences of computerization. But they have attracted attention and stimulated significant discussion.

Task 6. Answer the following questions to the text given above.

1. In what fields, mentioned in the text, has the computer found a wide application?
2. How has the Internet revolutionized the process of communication and information dissemination?
3. What is the most significant sociological question around total computerization?

Task 7. Fill in the gaps with the prepositions from the box.

of-2 in-3 between-2 at on by

Looking (1)_____this map, is it possible to see any difference between the two sets of measurements? Since the overall spread of the points exceed the differences in location (2)_____the two receivers, it is very hard to say, even (3)____the zoom of Santa Barbara harbor. Instead, we can compare the distributions statistically (4) _____examining the standard deviations (5)_____the easting and northing directions (6)_____, this case in latitude and longitude. Imagine the line between the two GPS locations for each point, with all eTrex points drawn on top (7)_____each other. We could look at the bearing (8)____these lines, 'rays' stretching out between the two readings for each point. We would expect the bearings and the lengths to be random, but the average length would now give a mean with a real meaning, the expected average distance difference (9)_____the two receivers. This can also be calculated from the standard deviation (10)____the easting and northings, calculated as the square root of the sum of the squared distances in the two directions.

Task 8. Translate the following sentences into English.

1. Моделью атрибутивных данных является плоский файл.
2. В модели атрибутивных данных числа вносятся в память в виде обычных или электронных таблиц.
3. Информация может быть представлена в виде каталогов, чисел, таблиц, текста, рисунков, карт и индексов.

4. Кластеры информации, называемые данными, могут храниться вместе в виде базы данных.
5. В базе данных мы храним признаки в виде заголовков, располагающихся в колонках (column headers) и группы взаимосвязанных элементов (records), располагающихся рядами.

Зміст

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