**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ**

**ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ МІСЬКОГО ГОСПОДАРСТВА імені О. М. БЕКЕТОВА**

МЕТОДИЧНІ ВКАЗІВКИ

ДЛЯ ОРГАНІЗАЦІЇ ПРАКТИЧНОЇ РОБОТИ

з дисципліни

# “ІНОЗЕМНА МОВА” (АНГЛІЙСЬКА МОВА)

*(для студентів 1 курсу денної форми навчання напряму 6.080101 “Геодезія, картографія та землеустрій” спеціальності “Геоінформаційні системи і технології”)*

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# *UNIT ONE. WHAT IS GIS*

## 1 LEAD-IN

**1.** What does GIS stand for?
**2.** How did you know about GIS?
**3.** Why do you want to make your career in GIS?

### 1.1 Vocabulary Notes:

| | | |
|---|---|---|
| spatial | – | пространственный |
| capabilities | – | *зд*. характеристики |
| retrieval | – | поиск |
| feature | – | *зд*. пространственный объект |
| tool | – | метод, способ |
| toolbox | – | *зд*. пакет вспомогательных программ |
| package | – | пакет программ |
| ad hoc | – | специальный, подготовленный специально |

## 2 READING

### 2.1 Read Texts A, B, C and D with some definitions of GIS.

A. A GIS IS A TOOLBOX

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.

B. A GIS IS AN INFORMATION SYSTEM

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.'

## C. A GIS IS AN APPROUCH TO SCIENCE

Goodchild defined 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.' He also noted that this involved both research *on* GIS and research *with* GIS. Supporting the science are the uniqueness of geographic data, a distinct set of pertinent research questions that can only be asked geographically, the commonality of interest of GIS meetings, and a supply of books and journals. On the other hand, Goodchild noted that the level of interest depends on innovation, that it is hard to sustain a multidisciplinary (rather than interdisciplinary) science, and that at the core of the science, in geography, a social science tradition has to some extent an antipathy toward technological approaches .

## D. A GIS PLAYS A ROLE IN SOCIETY

Many people doing research on GIS have argued that defining GIS narrowly, as a technology, as software, or as a science, ignores the role that GIS plays in changing the way people live and work. Not only has GIS radically changed how we do day-to-day business, but also how we operate within human organizations. Nick Chrisman (1999) has defined GIS as 'organized activity by which people measure and represent geographic phenomena then transform these representations into other forms while interacting with social structures.'

This definition has emerged from an area of GIS research that has examined how GIS fits into society as a whole, including its institutions and organizations, and how GIS can be used in decision making, especially in a public setting such as a town meeting, or on a community group Web site. This latter field is termed PPGIS, for Public Participation GIS.

**2.2 Reading Comprehension. Answer the questions using the information from Texts A, B, C and D.**

**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 ?

**4** What does a geographic information science involve?

**5** What is the definition of GIS functions from the point of view of social processes?

## 3 VOCABULARY

**3.1 Match the left and the right side. Translate the word combinations into your native language.**

| | | | | |
|---|---|---|---|---|
| **1** | ___ | technological | **a** | approaches |
| **2** | ___ | spatially distributed | **b** | features |
| **3** | ___ | functional | **c** | definition |
| **4** | ___ | software | **d** | package |
| **5** | ___ | spatial or geographic | **e** | coordinates |
| **6** | ___ | decision | **f** | maker |

**3.2 Look through the text again and find the corresponding verbs to the following definitions.**

**1** to make it difficult for someone or something to move forward or make progress _____

**2** to mention another book, article, etc. that contains information connected with the subject you are writing about _____

**3** to get back information that has been stored in the memory of a computer _____

**4** to come out of a difficult experience _____

**5** to support an idea or argument or prove that it is right _____

**3.3 Now 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 _____

**3.4 Translate the following attributive phrases into your native language. Mind the relationship between the words in phrases.**

***Example :*** computer system
different computer system
entirely different computer system

**1** data set _____
**2** standard data set _____
**3** exchange data set _____
**4** exchange-unfriendly data set _____
**5** worldwide nautical chart data _____
**6** true raster data formats _____
**7** topological data structures _____
**8** GIS data exchange _____
**9** database management system _____
**10** vector topology data structure _____

**3.5 Complete the following paragraph with words given below. Then translate it into your native language.**

| | | | |
|---|---|---|---|
| ***sources*** | ***tools*** | ***science*** | ***language*** |
| ***amount*** | ***resources*** | ***material*** | ***search*** |

SOURCES OF INFORMATION ON GIS

Historically, GIS has been a somewhat disjoint field from a reader's standpoint, and most of the major ’ooks, journals, and online (1)_____ date from only the last few years. This is far less an issue today, however, and there are now some excellent (2)_____ 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 (3)_____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 (4)_____. This is possible even at one's home computer, but slow enough tha’ a visit to the library may be more productive. Some libraries have facilities to connect to network (5)_____ systems and even specialized staff with training in geographic information.

As in our definition of geographic information (6)_____, 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 (7)_____ 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 (8)_____ 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.

## 4 LANGUAGE REVIEW

### 4.1 Examine the sentences in the Present Simple and the relevant descriptions.

| | | | |
|---|---|---|---|
| **1** | Our company **employs** 100,000 people, **operates** in many overseas markets, and **offers** a wide-range of hi-tech products for the 21st century. | – | presenting factual information |
| **2** | Competition **brings out** the best in products and the worst in people. | – | actions and situations which are generally true |
| **3** | I **suppose** their decision is right. | – | verbs used only in the present simple (verbs of perception , mental states, likes and dislikes, appearance, being) |
| **4** | The exhibition **opens** on 25 January. | – | talking about timetables, schedules and programmes (*future meaning*) |
| **5** | When she **gets** to the office she always checks her e-mail first. | – | subordinate clauses of time and condition |
| **6** | He *never* **smokes** at work.<br>I *often* **take** files home at the weekends. | – | saying how often you or other people do things |
| **7** | Peterson **overtakes** Williams and **wins** the race. | – | sports commentary, review, narration |
| **8** | **Place** the CD in the drive and click on the icon. | – | asking for and giving directions and instructions |

### 4.2 Place the adverbs in the box on the scale from the most to the least frequent and then add them to each sentence so that it is true for you.

| | | | |
|---|---|---|---|
| ***almost always*** | ***seldom*** | ***frequently*** | ***occasionally*** |
| ***rarely*** | ***hardly ever*** | ***never*** | ***almost never*** |
| ***often*** | ***usually*** | ***always*** | |

| **100%** | **50%** | **0%** |
|---|---|---|

*sometimes*

**1** I make an effort with my studies.
**2** I try to do my best at the exam.
**3** I go to the gym on Saturdays.
**4** I find time to relax and enjoy myself.
**5** I have arguments with my parents.
**6** I am able to make new friends while I am travelling.
**7** He gets home late.
**8** She chats to her friends online.
**9** My computer crashes.
**10** We play a joke on each other.
**11** He feels bored with his studies.
**12** They go clubbing at weekends.

**4.3 Underline the pronoun in each sentence. On the line in front of each sentence, write '*S*' if the pronoun is a subject pronoun, or '*O*' if the pronoun is an object pronoun.**

____ **1** My boss gave me the letter.
____ **2** We have been friends for many years.
____ **3** It is inside the pocket of the black backpack.
____ **4** Park the bicycles in the rack and leave the keys for us.
____ **5** I usually study for a few hours the night before a test.
____ **6** Send me a copy of the report in the mail.
____ **7** He never said goodbye before going on the month-long trip.
____ **8** Your parcel was delivered this morning.
____ **9** She's the woman who's just started working for our company.
____ **10** Could you please explain it to me?

**4.4 Complete the following dialogues by putting *the* into the space only where necessary.**

**1** **A:** 'Excuse me. Can you tell me where (**a**) ___ nearest bus stop is?'
**B:** 'It's on (**b**) ___ main road, just after (**c**) ___ supermarket."

**2** **A:** 'Did you have a good holiday?'
**B:** 'Yes, it was one of (**a**) ___ best we've ever had. (**b**) ___ hotel was comfortable, (**c**) ___ food was excellent and even (**d**) ___ beaches were clean. We're going back (**e**) ___ next summer.'

**3** **A:** 'Do you think (**a**) ___ men are better drivers than (**b**) ___ women?'
**B:** 'Not necessary. Some of (**c**) ___ worst drivers I know are (**d**) ___ men.'

**4** **A:** 'I don't agree that (**a**) ___ honesty is always (**b**) ___ best policy. Do you?'
**B:** 'Definitely not. (**c**) ___ diplomacy is sometimes more important.'

**5** **A:** 'Who is that girl over there talking to (**a**) ___ man with red hair?'
**B:** 'Oh, that's Sandra. She's one of (**b**) ___ girls I work with. She only started (**c**) ___ week before last.'

**4.5 Complete the exclamations with *a* or *an* only where necessary (not in every sentence).**

**Examples:** *What **an** awful shock! What beautiful flowers!*

**1** What ____ lovely day!
**2** What ___ nice people!
**3** What ___ awful experience!
**4** What ___ terrible noise!
**5** What ___ dreadful weather!
**6** What ___ well-behaved children!
**7** What ___ good idea!
**8** What ___ interesting story!
**9** What ___ sad news!
**10** What ___ idiotic thing to do!

**4.6 Decide whether the following nouns are used as countable or uncountable nouns as in the examples.**

| | | |
|---|---|---|
| **1** | She has had three years' ***experience*** as an accountant. | **_*U*_** |
| **2** | The demotion was a painful ***experiences.*** | **_C_** |
| **3** | Are you here for ***business*** or pleasure. | **___** |
| **4** | He has set up a small fashion ***business.*** | **___** |
| **5** | I've never fear ***works*** of Shakespeare. | **___** |
| **6** | She's found ***work*** as a commercial assistant. | **___** |
| **7** | Have you got a ***light***? | **___** |
| **8** | Were you able to throw any ***light*** on the subject? | **___** |
| **9** | They failed to reach an ***agreement.*** | **___** |
| **10** | Is there ***agreement*** on how much will be spent? | **___** |
| **11** | Self –***advertisement*** is not always a good thing. | **___** |
| **12** | We put an ***advertisement*** in the *Financial Times.* | **___** |

**4.7. Tick the words which normally have plurals in English.**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1** | advice _____ | **4** | answer _____ | **7** | penny _____ | **10** | money _____ |
| **2** | damond _____ | **5** | jewellery ____ | **8** | story _____ | **11** | news _____ |
| **3** | meat _____ | **6** | carrot _____ | **9** | scenery _____ | **12** | shirt _____ |

# *UNIT TWO. MAP AND ATTRIBUTE INFORMATION*

## 1 LEAD-IN

**1.** What do you like about your future profession?
**2.** How does GIS help in today's technological world?
**3.** What must be available for making GIS uses efficient?

### 1.1 Vocabulary Notes:

tangible (*adj.)* – ощутимый; ясный, реальный
record (*n*) – запись; график; отметка; информация
permeate (*v*) – проникать, распространяться
cluster (*n*) – группа объектов с общими признаками
item (*n*) – элемент данных
feature (*n*) – (*зд.*) пространственный объект, элемент

## 2 READING

### 2.1 Read the text.

MAP AND ATTRIBUTIVE INFORMATION

Information permeates our society, but fortunately, it takes on only a few tangible forms. Without the preordering of information, much of it would not be usable by humans in their everyday lives. Among these are the everyday methods for organizing information, visible by everyday examples such as the Yellow Pages, baseball box scores, magazines, or the television listings. Most information is usually preordered into lists, numbers, tables, text, pictures, maps, or indexes. Clusters of similar information, usually numbers and text, are called ***data.*** When data are entered into the computer, we store them as ***files*** and refer to them collectively as ***database.*** In database language, the items that we gather information about are referred to as ***attributes*** and individual data items as ***records***.

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,*** or descriptions of ***locations*** on the face of the earth. This means that pictures and especially maps can be a database, too. A link to the earth must somehow be placed into the GIS database, so that we can refer to the data by the location—and the location by the data. With this feature comes the fact that we can now manage the data using the underlying geography, the attributes, or both.

### 2.2 Reading Comprehension.

**1** Why can the information be not usable by humans?
**2** What methods of organizing information are available nowadays?

**3** What is the difference between the geographic information and most other information?

## 3 VOCABULARY

**3.1 Look through the text again and find the English equivalents to the following:**

**1** данные, информация _____
**2** база данных _____
**3** признак, характерный общий объект, атрибут _____
**4** записанная информация, запись (данных) _____
**5** вводить данные _____
**6** предварительная упорядоченность информации _____
**7** уметь обращаться, управлять _____
**8** ссылаться , упоминать _____

**3.2 Match the words on the right with the definitions on the left.**

| | | | |
|---|---|---|---|
| **1** | __ data | **a** | the science that deals with the principles, construction, and use of maps |
| **2** | __ database | **b** | 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 |
| **3** | __ file | **c** | a collection of data organized in a systematic way to provide access on demand |
| **4** | __ location | **d** | data logically stored together at one location on the storage mechanism of computer |
| **5** | __ cartography | **e** | a set of measurements or other values, such as text for at least one attribute and at least one record |

**3.3 Complete the following paragraph with words given below. Then translate it into your native language.**

| | | | |
|---|---|---|---|
| ***Science*** | ***places*** | ***location*** | ***street*** |
| ***information*** | ***map*** | ***attribute*** | ***computer*** |

The power of the GIS is in allowing the attribute and the geographic or map (1)_____ to be linked together in a useful way. For example, we can search the data both by the attributes and by using the (2)_____. Obviously, if the two sorts of information are linked, we can use either one to search the other, or we can use them together.

Central to this map and (3)_____ data use is finding a way to link the map with the attributes. As we are using a (4)_____, obviously the link should be in the form of numbers. When we locate people and houses, we usually use (5)_____ addresses rather than numbers. Later we will see that a GIS gives us the power to move from one to the other of these descriptions of location with numbers. For now, however, we need a simple number description for a (6)_____. It is important to get a feel for what the geographic numbers mean and how they correspond to (7)_____ on both the earth and the map. It is a little more complex than it first seems, but with a little digression, we can quickly come up to speed, and even be experts. This means that to understand GIS, we need to know a little cartography, which is the (8) _____ that deals with the construction, use and principles behind maps and map use.

**3.4 Fill in the remaining gaps in the table.**

| ***noun*** | ***verb*** | ***adjective*** | ***person/device*** |
|---|---|---|---|
| information | inform | _____ | _____ |
| practice | practise | _____ | _____ |
| management | _____ | manageable | _____ |
| model | _____ | model | _____ |
| usage | _____ | _____ | _____ |
| search | _____ | _____ | _____ |

**3.5 Read and 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 datum 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 _____
**7** (географическая) широта _____
**8** (географическая) долгота _____
**9** угол _____
**10** оценка; оценивать _____

## 4 LANGUAGE REVIEW

### 4.1 Examine the sentences in the Present Progressive and the relevant descriptions.

| | | | |
|---|---|---|---|
| **1** | "What **are** you **doing**?' 'I'**m trying** to find a file.' | _ | talking about an event in progress at the moment of speaking |
| **2** | We'**re waiting** for permission to go ahead with the project. | _ | actions happening around the moment of speaking |
| **3** | He'**s working** in Japan on a fixed-term contract. | _ | describing temporary situations |
| **4** | The number of people using the Internet **is growing.** | _ | changing or developing situations |
| **5** | She's got a new job so she'**s leaving** the form in October. | _ | fixed arrangements in the near future |
| **6** | His wife **is** always **telling** him not to work so hard. | _ | repeated actions with 'always' expressing annoyance or criticism |

### 4.2 Which of these ideas do you associate with the Present Simple (PS) and which with the Present Progressive (PP)?

| | | | | | |
|---|---|---|---|---|---|
| **1** | regular activity | ___ | **6** | permanent and factual situations | ___ |
| **2** | temporary situation | ___ | **7** | doing by saying | ___ |
| **3** | fixed time tables | ___ | **8** | mental states | ___ |
| **4** | giving instructions | ___ | **9** | trends and changing situations | ___ |
| **5** | an event in progress | ___ | **10** | a present arrangement for the future | ___ |

### 4.3 Study the sentences given below and decide which example corresponds to each of 1–10 in 4.2.

**a** ___ I'm replacing Brenda because she's off sick.
**b** ___ The scheduled flight leaves next Friday at 9.20 from JMK.

**c** ___ The technician is mending the computer so we can't use it right now.
**d** ___ She's seeing Alison Sykes tomorrow afternoon, she's got it in her diary.
**e** ___ The conference room measures 125 square metres.
**f** ___ We admit there has been a bad mistake.
**g** ___ I realize we have gone bankrupt.
**h** ___ Enter PIN number, select menu, choose language, press OK.
**i** ___ The world is getting smaller with the Internet.
**j** ___ We have a planning meeting once a month.

**4.4 Complete the following dialogues by putting the verbs in brackets into the correct form. Use only the Present Progressive or the Present Simple. Where there is also an adverb in the brackets, decide the correct position in the sentence. The first one has been done for you.**

**1** **A:** How (**a**) ***do*** you ***work*** (*work*) this photocopier? I
(**b**) _____ (*think*) I
I _____ (*do*) something wrong.
**B:** Yes, you (**c**) _____ (*press*) the wrong button. That one (**d**) _____ (*enlarge*) the copies. You (**e**) _____ (*need*) to press this one.
**A:** Oh, yes. It (**f**) _____ (*work*) properly now. Thanks.

**2** **A:** I (**a**) _____ (*see*) the price of petrol
(**b**) _____ (*go*) up again.
**B:** Yes, I I _____ know. I
(**c**) _____ (*seriously consider*) selling the car. It's so expensive, and we (**d**) _____ (*not/ often/ use*) it.
**A:** What (**e**) _____ your parents
_____ (*think*) of that idea?
**B:** They (**f**) _____ (*agree*) with me. They
(**g**) _____ (*not /like*) driving anyway.

**3** **A:** Good morning. Is Mr Smith in?
**B:** Yes, he is, but he (**a**) _____ (*see*) someone at the moment. (**b**) he _____ (*expect*) you?
**A:** Yes, I (**c**)_____ (*have*) an appointment with him at 10.30. My name is Phillips.
**B:** Ah, yes, Mr Phillips. I'm afraid we (**d**) _____ (*run*) a little late this morning,. But I (**e**) _____ (*not/ expect*) Mr Williams will be long, if you (**f**) _____ (*not mind*) waiting.

**4** **A:** What (**a**) _____ you _____ (*think*) of that new girl, Jacqueline?

**B:** Well, frankly, I (**b**) _____ (*find*) her terribly annoying. She I (**c**) _____ (*always/ make*) silly Remarks and she (**d**) _____ (*never/ listen*) to Anything you say.

**A:** I (**e**) _____ (*know*) what you (**f**) _____ (*mean*), but I (**g**) _____ (*feel*) a bit sorry for her, actually. I (**h**) _____ (*think*) she (**i**) _____ (*try*) to hide her shyness by being funny, but she (**j**) _____ (*only/ succeed*) in getting on everyone's nerves!

**4.5 If you think the following should have *the*, put a tick (✓). Write (×) in front of those which do not need *the*.**

| | | | |
|---|---|---|---|
| _____ | abbreviated countries | _____ | non-abbreviated countries |
| _____ | groups of islands | _____ | single island |
| _____ | mountain ranges | _____ | single mountains |
| _____ | oceans and rivers | _____ | lakes |
| _____ | newspapers | _____ | magazines |

**4.6 Add *the* where necessary.**

| | | | | | |
|---|---|---|---|---|---|
| **1** | _____ | United Nations | **16** | _____ | St Peter's Square |
| **2** | _____ | N.A.T.O. | **17** | _____ | Great Wall of China |
| **3** | _____ | Beatles | **18** | _____ | Mount Everest |
| **4** | _____ | Mediterranean | **19** | _____ | Rolling Stones |
| **5** | _____ | Lake Victoria | **20** | _____ | Black Sea |
| **6** | _____ | U.S. | **21** | _____ | Kremlin |
| **7** | _____ | Equator | **22** | _____ | Christmas |
| **8** | _____ | Canaries | **23** | _____ | Himalayas |
| **9** | _____ | Outer Space | **24** | _____ | Twenty First Century |
| **10** | _____ | Far East | **25** | _____ | Ganges |
| **11** | _____ | New York Times | **26** | _____ | Thirties |
| **12** | _____ | Pacific | **27** | _____ | Warsaw Pact |
| **13** | _____ | West | **28** | _____ | North Pole |
| **14** | _____ | British Airways | **29** | _____ | Piccadilly Circus |
| **15** | _____ | World Bank | **30** | _____ | Milan Cathedral |

# *UNIT THREE. COORDINATE SYSTEMS*

## 1 LEAD-IN

**1.** Decide whether the following statements represent the benefits of GIS.

- Cost Savings and Increased Efficiency
- Better Decision Making
- Improved Communication
- Better Recordkeeping
- Managing Geographically

**2.** Do you know what the disadvantages of GIS are?

### 1.1 Vocabulary Notes:

| | | |
|---|---|---|
| to convert | - | превращать, переделывать |
| to align with | - | совмещать с ч -л |
| to derive | - | устанавливать происхождение |
| to remote | - | удалять, устранять |
| to seek | - | искать, определять |
| to distort | - | искажать |
| to list | – | вносить в список, составлять список |
| curvature | – | кривизна, изгиб, искривление |

## 2 READING

### 2.1 Read the text.

Converting maps into numbers requires that we choose a standard way to encode locations on the earth. Maps are drawn (whether by computer or not) on a flat surface such as paper. Locations on the paper can be given in ***map millimeters*** or inches starting at the lower left-hand corner. A computer plotter or a printer can understand these dimensions also, and usually requires that the locations be given in ***( x, y)*** format; that is, an east-west distance or ***easting***, followed by a north-south distance or ***northing***. This pair of numbers is called a ***coordinate pair*** or, more usually, a ***coordinate.*** Standard ways of listing coordinates are then called ***coordinate systems***. Maps on common coordinate systems are automatically aligned with each other.

A significant problem with coordinates is that while the map dimensions are simple and the ( ***x, y*** ) axes are at right angles to each other, locations on earth's surface are not so simply derived. The first and foremost problem is that a flat map of all or part of earth's surface is necessarily on a map projection. Something has been distorted to make the surface flat, usually scale, shape, area, or direction. On our flat map, we would like all of the earth's curvature removed. Just how this is done depends on which of the various coordinate systems we use, how big an area we seek to map, and what projection the system uses.

## 2.2 Reading Comprehension.

**1** In which occasions do we encode locations on the earth?
**2** What does a coordinate pair consist of?
**3** What can be distorted on a map projection?

## 3 VOCABULARY

### 3.1 Look through the text in 2.1 and find the English equivalents to the following:

**1** к востоку, на восток _____
**2** к северу, на север _____
**3** кривизна _____
**4** габаритные размеры _____
**5** графопостроитель _____
**6** способ, метод, средство _____
**7** поверхность _____

### 3.2 Match the terms on the left with the definitions on the right.

| | | | | |
|---|---|---|---|---|
| **1** | __ | easting | **a** | a location in geographic space given with respect to a known origin and standard measurement system, such as a coordinate system |
| **2** | __ | northing | **b** | the distance of a point in the units of the coordinate system east of the origin for that system |
| **3** | __ | absolute location | **c** | a coordinate system based on the dimensions of the map rather than those of the features represented on the earth itself, in metric units |
| **4** | __ | distortion | **d** | the space distortion of a map projection, consisting of warping of direction, area, and scale across the extent of the map |
| **5** | __ | map millimeters | **e** | the distance of a point in the units of the coordinate system north of the origin for that system |

### 3.3 Fill in the gaps in the table.

| **verb** | **noun (for person)** | **noun (for idea)** | **adjective** |
|---|---|---|---|
| represent | _____ | _____ | _____ |
| distort | _____ | _____ | _____ |
| coordinate | _____ | _____ | _____ |
| direct | _____ | _____ | _____ |

### 3.4 Put the word partnerships into the correct column as in the example.

| | | *noun + noun* | *adjective + noun* |
|---|---|---|---|
| **1** | computer plotter | _____ | ✓ |
| **2** | database language | ✓ | _____ |
| **3** | professional societies | _____ | _____ |
| **4** | flat surface | _____ | _____ |
| **5** | standard ways | _____ | _____ |
| **6** | coordinate system | _____ | _____ |
| **7** | spatial data | _____ | _____ |
| **8** | research questions | _____ | _____ |
| **9** | data items | _____ | _____ |
| **10** | human organization | _____ | _____ |

### 3.5 Choose the correct form of the word.

**1** I'd like to know the degree of_____ of the earth's surface. (CURVE)

**2** Data _____ is the _____ of computer data from one format to another (CONVERT)

**3** A GIS _____ manages the use of Geographic Information System (GIS) technology for a company or region. (COORDINATE)

**4** A GIS is a database of all kinds of information that has _____ , so it can be mapped. (LOCATE)

**5** Attribute data are descriptions, _____ , and/or classifications of the geographic features. **(**MEASURE**)**

## 4 LANGUAGE REVIEW

### 4.1 Complete the sentences about yourself using the Past Simple tense.

**1** When I was not a student, I _____

**2** On my first day at the Academy, I _____

**3** Three months ago, while I _____

**4** Last Saturday, after I _____

**5** When I left home yesterday, I _____

**6** During my last holiday, I _____

**7** I helped my friend because _____

**4.2 Write ten sentences by matching items from the following columns and adapting the verbs. Mind the Past Simple tense.**

| | | | |
|---|---|---|---|
| **1** | The dentist | (*carry*) | the tap yesterday. |
| **2** | The police | (*set*) | my tooth last Friday. |
| **3** | The gardener | (*take out*) | the helicopter over the city an hour ago. |
| **4** | The lecturer | (*draw*) | fertilizer on the flower beds last week. |
| **5** | The porters | (*drive*) | the tables for lunch half an hour ago. |
| **6** | The waitresses | (*mend*) | the thieves red handed two days ago. |
| **7** | The pilot | (*spread*) | psychology at the college in 2009. |
| **8** | The chauffeur | (*teach*) | the luggage. |
| **9** | The plumber | (c*atch*) | to the car five minutes ago. |
| **10** | The engineer | (*fly*) | the Rolls Royce fast to Esher last night. |

**4.3 A. Last week John went to Scotland on business trip. Read his diary for last week. Then complete the report he wrote for his boss using the Past Simple.**

| | |
|---|---|
| ***9 April*** <br> ***Tuesday*** <br> ***a.m.*** *fly to Edinburgh* <br> *have lunch with Scottish sales team* | ***10 April*** <br> ***Wednesday*** <br> ***a.m.*** *drive to Glasgow* <br> *meet architect – look at new office plans* |
| ***p.m.*** *visit two factories* <br> *discuss last series of adverts with marketing manager (not keen on team)* | ***p.m.*** *go to see new office building* <br> *invite architect to dinner (not free)* <br> *catch overnight train to London* |

Report: Visit to Scotland

Date: 9 & 10 April Name: John Hutchings

I (1) *flew* to Edinburgh on Tuesday morning and (2) _____ lunch with the Scottish sales team. Then I (3) _____ our two factories there and (4) _____ our last series of adverts with the marketing manager. He (5) _____ keen on them, unfortunately.

On Wednesday morning I (6) _____ to Glasgow and (7) _____ the architect. We (8) _____ at the new office plans and in the afternoon we (9) _____ to see the new office building. I (10) _____ the architect to dinner, but he (11) _____ free. I (12) _____ the overnight train to London.

**B. Think about what you did one day last week. Complete the diary below. Then write a report using the Past Simple.**

***a.m.*** _____ ***dinner***_____
***lunch***_____ ***evening***_____
***p.m.*** _____

Report:
Date: Name:
On _____ ___ morning I _____
_____
_____
_____

**4.4 Read the conversation. Below, write the correct form of the verbs in italics. Some of the verbs become QUESTIONS, some become NEGATIVE forms, and some DO NOT CHANGE. If there is no change, put a dash (–). The first is done for you. Then role play the dialogue.**

**Joe:** How (1) *your trip went?*
**Tim:** (2) *It went* very well. (3) *I visited* the Fabiani factory in Milan.
**Joe:** What (4) *you think* of it?
**Tim:** (5) It *looked* very impressive. (6) *I spoke* to the Manager, Signor Verdi. (7) *He seemed* very interested in doing business with us.
**Joe:** (8) *You discussed* our plan for having a European partner?
**Tim:** Yes, (9) *I told* him about it. (10) *He asked* me to arrange a meeting with you. However, (11) *I made* any definite arrangement.
**Joe:** I'll phone him. (12) *You met* the Director of ETL?
**Tim:** No, (13) *I managed* to meet him. He was away. But, (14) *I met* his assistant. (15) *We had* an interesting conversation.
**Joe:** Good. And when (16) *you got* back?
**Tim:** Last night. In fact (17) *the plane arrived* after midnight.
**Joe:** You must be tired. Take things easy today.

**1** *did your trip go*
**2** _____
**3** _____
**4** _____
**5** _____
**6** _____
**7** _____
**8** _____
**9** _____
**10** _____
**11** _____
**12** _____
**13** _____
**14** _____
**15** _____
**16** _____
**17** _____

**4.5 Read the sentences below. They were said by an employee returning from a trip. Form the questions to the italicized parts of the statements.**

**1** I found out *some interesting information.*

_____

**2** The Manager took me to *the warehouse.*

_____

**3** He showed me *their stock control system.*

_____

**4** They installed it in *2009.*

_____

**5** They chose *the XQ-300 system.*

_____

**6** It performed *magnificently.*

_____

**7** The computer engineers gave *excellent* service.

_____

**8** They connected the regional branches to the system *last October.*

_____

**9** The Manager recommended *a similar system.*

_____

**4.6 Write these figures out in full.**

**Example:**

| | |
|---|---|
| 29 p | - twenty nine pence |
| 3 /10/2012 (American) | - the 10th of March, (twenty twelve) 2012 |
| 9.49 | - eleven minutes to ten (in the morning) **(*the informal way* (e.g. *at home*)** |
| 18.45 - | - eighteen forty-five (***the formal way*** (**e.g. *for timetables***) - the 24-hour clock) |
| 20.00 | - eight p.m. OR twenty (hundred) hours (***the quite formal way*** (**e.g. *on the radio***) - the 12-hour clock |

**1** £174.5
**2** $62.98
**3** 50°
**4** 2,000,000
**5** 254th
**6** early1990s
**7** 1/2%
**8** 9.36 (*time, informal*)
**9** *(number of years )* 2009
**10** 10 /3/2012 (*British*)

## *UNIT FOUR. REPRESENTING MAPS AND NUMBERS*

### 1 LEAD-IN

**1.** What symbols are usually used to represent features on a map?

**2.** What is colour-coding used for?

### 1.1 Vocabulary Notes :

| | | |
|---|---|---|
| critical difference | – | основное отличие |
| to capture | – | захватывать; собирать |
| impact | – | влияние, воздействие |
| visual map | – | наглядная, визуальная карта |
| mappy package | – | картографический пакет |
| encoding numbers | – | цифры кодирования |
| numerical value | – | числовое значение |
| to devise | – | изобретать, разрабатывать |

### 2 READING

### 2.1 Read the text.

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.

**2.2 Reading Comprehension.**

**1** What do geographic numbers represent?

**2** What is converted into a set of digits?

**3** What two alternative ways of storing numbers exist?

## 3 VOCABULARY

**3.1 Look through the text in 2.1 and find words that correspond to the following definitions:**

| | | | |
|---|---|---|---|
| **1** | _____ | _ | not important or serious |
| **2** | _____ | _ | a set of events, actions, numbers, etc. |
| **3** | _____ | _ | a collection of information stored together in a computer |
| **4** | _____ | _ | to change information into a form that can be processed by a computer |
| **5** | _____ | _ | consider something in a particular way |

**3.2 Match the terms on the left with the definitions on the right.**

| | | | |
|---|---|---|---|
| ___ | attribute | **a** | the smallest storable unit within a computer's memory with only an on and an off state, codable with one binary digit |
| **2** ___ | bit | **b** | an attribute is a characteristic of a feature that contains a measurement or value for the feature |
| **3** ___ | byte | **c** | a single entity that composes part of a landscape |
| **4** ___ | feature | **d** | a data structure for maps based on grid cells |
| **5** ___ | raster | **e** | eight consecutive bits |

**3.3 Match the words on the left with relevant translation on the right. Find them in the text below.**

| | | | | | |
|---|---|---|---|---|---|
| **1** | ___ | attribute data | **a** | формат растра |
| **2** | ___ | raster format | **b** | признаки, показатели |
| **3** | ___ | grid cell | **c** | единица (измерения) |
| **4** | ___ | unit | **d** | ячейка сетки |
| **5** | ___ | increment | **e** | присваивать значение |
| **6** | ___ | to assign value | **f** | база атрибутивных данных |
| **7** | ___ | attribute data base | **g** | инкремент, увеличение |

It is the logical structure of the data that requires us to have a mental 'model' of how the physical data represent a geographic feature, just as a sheet map is a flat paper 'symbol' model of the landscape it covers. Traditionally in GIS and computer cartography, there were two basic types of data model for map data and only one for attribute data. Map data could be structured in ***raster*** or ***vector*** format, and attributes as flat files.

A raster data model uses a grid, such as the grid formed on a map by the coordinate system, as its model or structure to hold the map data. Each grid cell in the grid is one map unit, often chosen so that each grid cell shows on the GIS map as one screen display point or ***pixel*** or on the ground as a whole-number increment in the coordinate system. A pixel is the smallest unit displayable on a computer monitor. If you get a magnifying glass and look at a monitor or a television set, you will see that the picture is made from thousands of these tiny pixels, each made up of a triangle of three phosphor dots, one dot for red, one for green, and one for blue (if your screen displays colour). When we capture a map into the raster data model, we have to assign a value to every cell in the grid. The value we assign can be the actual number from the map such as the terrain elevation in a digital elevation model (DEM), or more usually, it is an index value standing for an attribute that is stored separately in the attribute database.

## 4 LANGUAGE REVIEW

### 4.1 Examine the sentences in the Past Progressive and the relevant descriptions.

| | | | |
|---|---|---|---|
| **1** | He **was working** on the report all day long. | _ | emphasizing the duration or continuity of a past event |
| **2** | I **was** just **leaving** the office when he arrived. | _ | describing a background event |
| **3** | Last month we **were having** a lot of problems with the production line. | _ | for repeated events |
| **4** | I **was wondering** if you could give me a lift downtown.<br>*(There is no idea of past time here. The past verb form is a polite formula and makes the request less direct.)* | _ | making polite requests |
| **5** | She **was going** to phone them yesterday but didn't have the time. | _ | for event planned in the past which did not take place |

**4.2 Read each pair of sentences. Combine them into one sentence using the Past Simple or the Past Progressive form of the verbs.**

**1** Diana attended a meeting. The blizzard started.
When *the blizzard started, Diana was attending a meeting.*

**2** She drove home. She listened to her car radio.
While _____

**3** She pulled over to the side of the road. The visibility got very bad.
_____ when _____

**4** She listened to the news. She heard about the accident.
_____ while _____

**5** It stopped snowing. She drove to the police station.
_____ when _____

**6** She talked to the police. She thought about her article for the morning paper.
While _____

**4.3 Write the verb in brackets in the Past Simple or Past Progressive form in each gap.**

HIGH–TECH TROUBLE

It all (1) _____ (*start*) as I made my way home from work. We (2) _____ (*work*) on a top secret computer programme, and everyone (3) _____ (*get*) pretty nervous about finishing on time, so it was good to get away from the office. It (4) _____ (*rain*) and it seemed like everyone (5) _____ (*travel*) home at the same time, anxious to avoid getting wet. I (6) _____ (*go*) down into the underground station and (7) _____ (*wait*) for the train when I (8) _____ (*see*) her at the end of the platform. She (9) _____ (*wear*) red leather jacket that (10) _____ (*remind*) me of something I'd seen in a film, although I couldn't remember when. As I watched, she (11) _____ (*open*) her handbag and (12) _____ (*take*) out what looked like a hand-held computer. She (13) _____ (*check*) something on the screen, then (14) _____ (*look*) in my direction. Suddenly, my mobile phone (15) _____ (*make*) a sound that (16) _____ (*mean*) I had a text message. Frowning, I (17) _____ (*press*) a key and a message (18) _____ (*appear*). "We have kidnapped your daughter. We know you have completed the programme. Follow the woman in red." I looked up just as she (19) _____ (*disappear*) round the corner. I (20) _____ (*race*) after her.

**4.4 Complete the sentences using the Past Simple or Past Progressive.**

**1** **A:** What _____ (*you/do*) when the phone (*ring*)?
**B:** I _____ (*water*) the plants in the garden. That's why I (*not/hear*) it.

**2** **A:** I _____(*come*) by your house at 8 o'clock but you _____ (*not/be*) there.

**B:** Oh, I'm sorry. I _____ (*walk*) the dog at that time.

**3** **A:** _____ (*you/manage*) to fix the car on your own?

**B:** No. I _____ (*try*) all morning, but in the end I _____ (*take*) it to the garage.

**4** **A:** I _____ (*write*) an email to Mr Thomson when the computer _____ (*crash*).

**B:** Oh, no! _____ (*you/call*) the technician to come and fix it?

**5** **A:** What _____ (*happen*) to Jill?

**B:** She _____ (*fall*) off her bike as she _____ (*go*) to school.

**4.5 Read the following passage and choose where to insert these sentences.**

STEVE JOBS

***A*** *Magazines such as Fortune and Business Week were all mocking him.*

***B*** *But it is true that Lobs was still losing money. In the early q990s he was going bankrupt at an alarming rate.*

***C*** *Pixar Animation Inc. was also bleeding cash fast.*

***D*** *His two businesses, Next (a computer firm) and Pixar (a computer animation company), were rapidly going bankrupt.*

Entrepreneurs can go through long periods of bad luck and fall on hard times. Stave Jobs, the founder of Apple, is one of these people. Since enjoying tremendous success in the 1980s he spent 11 years of humiliating failure.

After he was sacked by Apple, he lost millions of dollars by selling his shares at the wrong time. …… (1). Next had spent 180- million of its shareholders' money and had nothing to show for it. ……. (2).

For five yeas, the criticism from the business press was universal and deafening. …… (3). Then a writer called Randall Stross published a book called Steve Jobs and the Next Big Thing which accused him, among other things, of fostering false optimism on successes that didn't exist and having no financial know-how. It was a humiliating attack. …… (4). By 1995 he had lost 200m out of a fortune 0f 300m.

Now all that is behind him Pixar now makes animated movies in partnership with Disney. Toy Story was the third-highest earning animation of all time and the launch of the iMac was a huge success. We haven't heard the last of Mr Jobs.

# *UNIT FIVE. STRUCTURING MAPS*

## 1 LEAD-IN

**1.** Why do you think maps are necessary?

**2.** What is the latitude and longitude of Ukraine on the map?

### 1.1 Vocabulary Notes :

| | | |
|---|---|---|
| to structure | _ | составлять (карту) |
| feature | _ | пространственный объект |
| scaled-down | _ | уменьшенный в масштабе |
| regular attribute | _ | обычный характерный признак |
| land parcel | _ | земельный участок |
| plotter | _ | графопостроитель |
| unwieldy | _ | громоздкий, неуклюжий |
| ASCII | _ | Американский стандартный код для обмена информацией |

## 2 READING

### 2.1 Read the text.

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.

**2.2 Reading Comprehension.**

**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?

## 3 VOCABULARY

**3.1 Match the left and the right side to make the word combinations. Then use the word combinations in the following sentences.**

| | | | | |
|---|---|---|---|---|
| **1** | ___ | to represent/to draw | **a** | of lines |
| **2** | ___ | to store | **b** | the end of the line |
| **3** | ___ | to signify | **c** | different shapes and sizes |
| **4** | ___ | to consist | **d** | in a database |
| **5** | ___ | to be | **e** | features |

**1** Did you ever want to evaluate PHP code that you_____ in a MySQL _____?
**2** It is possible for a dependent linear system_____ two ___ with different slopes.
**3** All features are complicated because they can _____.
**4** We usually take quantitative and qualitative data _____.
**5** In computing there is a special character or sequence of characters used _____ of text.

**3.2 Match the terms on the left with the definitions on the right.**

| | | | | |
|---|---|---|---|---|
| **1** | __ | vector | **a** | a single cell in a rectangular grid |
| **2** | __ | grid cell | **b** | a map data structure using the point or node and the connecting segment as the basic building block for representing geographic features |
| **3** | __ | line | **c** | a zero-dimensional map feature, such as a single elevation mark as specified by at least two coordinates |
| **4** | __ | point | **d** | a one-dimensional (length) map feature represented by a string of connected coordinates |
| **5** | __ | volume | **e** | a two-dimensional (area) feature represented by a line that closes on itself to form a boundary |
| **6** | __ | area | **f** | a three-dimensional (volume) feature represented by a set of areas enclosing part of a surface, in GIS usually the top only |

**3.3 Match the words from the passage on the left with the meaning on the right. Then chose and underline the correct form of the words in brackets.**

| | | | | |
|---|---|---|---|---|
| **1** | ___ | to truncate | **a** | включать в себя; подразумевать; предполагать |
| **2** | ___ | to involve | **b** | сокращать, укорачивать, усекать |
| **3** | ___ | to list | **c** | следить, прослеживать; вычерчивать |
| **4** | ___ | to trace | **d** | составлять список, перечислять |
| **5** | ___ | to evolve | **e** | имеющий значение; обоснованный; допустимый |
| **6** | ___ | valid | **f** | развивать, разрабатывать |
| **7** | ___ | efficient | **g** | ценный, полезный |
| **8** | ___ | valuable | **h** | продуктивный, рациональный, экономичный |
| **9** | ___ | effective | **i** | плотное размещение; компоновка |
| **10** | ___ | packing | **j** | эффективный, действенный, полезный |
| **11** | ___ | arc | **k** | отдельный элемент |
| **12** | ___ | entry | **l** | дуга, отрезок кривой; сектор |
| **13** | ___ | package | **m** | отрезок кривой; изогнутость; изгиб |
| **14** | ___ | arch | **n** | группа (однородных объектов); набор; комплект арка; |

At the least, we need a file containing the attributes for the polygon, a file (1) ***listening/listing*** the arcs within the polygon and finally a file of coordinates that, are referenced by the (2)***arc/arch*** file. We need to store in each of these files a set of references between the files. For example, an (3)***entry/entrance*** in the arcs files states that to get the points for arc 2 from the points file they begin at the first coordinate point in the file, followed by the (4)***eight/eighth***, the ***nine/ninth***, and so on.

During the early days of GIS, several systems (4)***involved/evolved*** different versions of this structure. Obviously, to save space we could write the files in binary. There are few ways, however, to store point, line, and area data that are as (4)***efficient/effective***. As long as the data are (5)***valuable/valid***, this is a very powerful way to store data for map features. When the system breaks down, however, is when data contain errors, which is virtually always.

The formats of the data are documented formally, and the files are ASCII. They use the ground coordinates in UTM, (6)***truncated/traced*** to the nearest 10 meters to reflect their locational precision and to save space. Features are handled in separate files—for example, hydrology, hypsography (contours and topographic features), transportation, and political. Many GIS (7)***packages/packing*** will import these files, but often some extra data manipulation is necessary, such as making the records of some fixed line length in bytes.

**3.4 Read the text. Put questions to the words or phrases in italics. Use the answers to the questions to give a brief summary of the text.**

RASTER DATA STRUCTURES

Raster or grid data structures have formed the ***basis for many GIS packages***. The ***grid*** is a surprisingly versatile way of storing data. The data form an array or matrix of rows and columns***. Each pixel or grid cell*** contains either a data value for an attribute, or an index number that points to reference in the attribute database. So a pixel containing the number 42, for example, could ***correspond*** with the number 42 or 'deciduous forest' in the Anderson Level II system, or just the 42nd record in the attribute file.

To write the numbers to a file, we can just start the file with ***any necessary attribute*** codes, perhaps the number of rows and columns and the maximum size of one value, and then write the data into the file in binary across ***all*** columns for all rows, one long stream of data with a start and an end, like an unraveled sweater. ***When reading the data back in,*** we just place the data back into a raster grid of the correct dimensions.

**3.5 Match the left and the right side. Then fill in the gaps with correct form of some of these words and translate orally the paragraph.**

| | | | | |
|---|---|---|---|---|
| **1** | ___ | consistent | **a** | накладывать, совмещать |
| **2** | ___ | node | **b** | согласованный, совместимый |
| **3** | ___ | county | **c** | извлекать, удалять |
| **4** | ___ | to extract | **d** | обобщать, расширять (*напр*. Круг понятий) |
| **5** | ___ | to generalize | **e** | узел, узловая точка, место |
| **6** | ___ | to overlie (overlay, overlain) | **f** | графство (административная единица в Англии) |

The primary advantage of having a topologically (1) _____ map is that when two or more maps must be (2) _____ , much of the initial preparation work has been done. What still has to be established are where new points must be added along lines to become (3) _____, and how to deal with any small or sliver polygons that are created. The latter can be a real problem. Many borders between regions, states, (4) _____ and so on match along lines such as rivers, which are (5) _____ differently at different map scales. Although the line should be the same, in fact it is not. Some packages allow the (6) _____ of a line from one map to be 'frozen' for use on another. This seemingly small difference can be very significant, especially if areas or densities are being calculated.

## 4 LANGUAGE REVIEW

### 4.1 Examine the sentences in the Present Perfect and the relevant descriptions.

| | | | |
|---|---|---|---|
| **1** | Information technology **has broken down** the barriers of geography and time. | _ | talking about present results of past actions |
| **2** | He'**s done** many jobs in his time. He'**s sold** encyclopedias, he'**s been** a journalist, he'**s worked** in a shoe factory and now he's a trade unionist. | | Talking about life experience |
| **3** | I'**ve** *never* **seen** the Niagara Falls.<br>We'**ve had** a good year *so far*.<br>**Hasn't** she **decided** what to do *yet*?<br>**Have** you *ever* **visited** China?<br>I **have** *already* **had** a word with Bruce.<br>We'**ve grown** rapidly *over the last few years*. | _ | with expressions referring to 'time up to now' |
| **4** | He'**s been** vice-president *for* 10 years. (up to now)<br>He'**s had** the same job *since* 2005.<br>She'**s** *always* **been** a creative person. | _ | with the adverbs |
| **5** | I can't make a decision *if* I **haven't received** all the data.<br>I'll phone you *when* I'**ve received (**OR **when I receive)** confirmation.<br>I won't make a decision *until* I **have spoken** to the CEO. (OR until I **speak**)<br>I'll leave *as soon as* I'**ve finished**. (OR as soon as I **finish**) | _ | referring to a completed event in the future after *when*, *as soon as*, *until*, etc. |
| **6** | This is the first time we **have (ever) received** a complaint. | | After *this is the first / second time* |

### 4.2 Sort the following words into two categories:

| | | |
|---|---|---|
| ***ago*** | ***since*** | ***during the 2000s*** |
| ***yet*** | ***last year*** | ***over the last two years*** |
| ***so far*** | ***yesterday*** | ***for the past three months*** |
| ***lately*** | ***at 3 o'clock*** | |

| **…used with the present perfect** | | **…used with the past simple** | |
|---|---|---|---|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

**Choose the correct adverb:**

**1** I've *yet / **already** / so far* spoken to Peter about it.
**2** We've made a lot of progress ***over the past three months*** */ since three years / during three years.*
**3** We set *up **two years ago** / during the 2010s / over the last two years.*

**4.3 Make questions with "*How long…?*" in the Present Perfect.**

**1** The system/ break down
_____ ?
**2** It/be a real problem
_____ ?
**3** You/ know each other
_____ ?
**4** He /be interested in GIS
_____ ?
**5** Topological data structures /be widespread in GIS
_____ ?

**4.4 Make questions with "*When*…?" in the Past Simple.**

**1** The system/ break down
_____ ?
**2** You/display information on a map
_____ ?
**3** GIS/come into common use
_____ ?
**4** Geographic database/to be built
_____ ?
**5** You/ store information on disk
_____ ?

**4.5 Write a word from the box in each gap.**

| | | | |
|---|---|---|---|
| ***already*** | ***for*** | ***since*** | ***until*** |
| ***before*** | ***just*** | ***so*** | ***yet*** |
| ***ever*** | ***recently*** | ***still*** | |

**1** We've ___ realized what is different! She's changed her hair.
**2** His grandmother's been quite ill ___, so she's coming to stay with him for a week or two.
**3** We've had broadband at home ___ 2009.
**4** Have they really finished their work ___? OK, they can relax, then.

**5** We've won every match we've played __ far this season.
**6** I've always lived in a big house ___ now, so it's taking some tome to get used to being in a small flat.
**7** We can't cancel the party now – I've ___ invited everyone!
**8** How long has Sue gone abroad ___ ?
**9** Don't get Matthew that game; I'm pretty sure he's got it ___.
**10** Have you ___ through of going into business on your own?
**11** We haven't started ___ so you can join in if you like.
**12** We've never been to New York ___, so we are both really looking forward to it.
**13** Have they been living in the neighbourhood ___ you moved in?
**14** I ___ haven't found my tools.
**15** I've been looking for a website like this ___ ages!
**16** It's strange you should ring now. We've been ___ talking about you.
**17** John, Haven't you done your work ___? I think it's time you started, isn't it?

### 4.6 What could we use in place of the words in brackets?

**1** Your mother has gone to (the shop owned by the hairdresser) _**the hairdresser's**.
**2** I'll meet you at (the shop owned by the chemist) _____ .
**3** I'm going to spend the night at (the house owned by my aunt) _____ .
**4** We were married in (the church dedicated to St Andrew) _____ .
**5** I bought this at (the department store owned by Marks and Spencer) _____ .

### 4.7 Fill in the gaps with have/has been (to) or have/has gone (to).

- Notice the difference between ***has been to*** and ***has gone to*.**
  *She'**s been to** Paris* means she went there and has now returned.
  *She'**s gone to** Paris* means she went there but has not yet returned. She is still there.

**Jack:** Hi, Jill. Where's Paul?
**Jill:** Oh,he (1) _____ London for a few days..
**Jack:** Really! I (2) _____ London recently. I came back yeaterday. (3) _____ you _____ there?
**Jill:** No, I haven't. Paul (4) _____ twice before, though. Where's Sarah?
**Jack:** She (5) _____ Spaine for two weeks with her parents. They (6) _____ there to visit some friends.
**Jill:** When is she coming back?
**Jack:** They'll all be back next weeken.

# *UNIT SIX. FORMATS FOR GIS DATA*

## 1 LEAD-IN

**1.** What do you know about GIS file formats?
Are they created by government mapping agencies, by GIS software developers, or by both of them?

### 1.1 Vocabulary Notes:

| | | |
|---|---|---|
| to handle | _ | обрабатывать данные, оперировать данными |
| to regard | – | принимать во внимание |
| to import | – | вводить |
| utility programme | _ | сервисная программа, утилита |
| at one's peril | – | на свой собственный риск |
| native | – | родной , собственный |
| proprietary | – | патентованный |
| sequential | – | являющийся продолжением или следствием |

## 2 READING

### 2.1 Read the text.

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.

**2.2 Reading Comprehension.**

**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?

## 3 VOCABULARY

**3.1 Match the left and the right side to make the word combinations. Then use the word combinations in the following sentences.**

| | | | | |
|---|---|---|---|---|
| **1** | ___ | data | **a** | ways |
| **2** | ___ | digitized | **b** | converters |
| **3** | ___ | utility | **c** | data |
| **4** | ___ | alternative | **d** | data format |
| **5** | ___ | common | **e** | programme |

**1** A program designed for general support of the processes of a computer is called a _____ _____.

**2** _____ _____ can be easily read and processed by a computer.

**3** ____ _____ to mapping and GIS activities are as follows: analogue and digital.

**4** This document serves to introduce the user to some of the _____ _____ _____.

**5** The conversion of computer data from one format to another is possible with_____ _____.

**3.2 Use your dictionary to fill in the gaps in the table. Then use one of the parts of speech from the table to complete the sentences given below.**

| verb | adjective | adverb | noun(for idea) |
|---|---|---|---|
| to document | _____ | _____ | _____ |
| to industrialize | _____ | _____ | _____ |
| to structure | _____ | _____ | _____ |
| to surprise | _____ | _____ | _____ |
| to object | _____ | _____ | _____ |

**1** She looked _____ well.

**2** The film was given a _____ style by the director.

**3** I find it difficult to be _____ where he's concerned.

**4** Students learn how to _____ their essays.

**5** By _____ we mean the increasing use of machines to replace human skills in the production of goods and services.

**3.3 Read and translate key terms and their definitions**.

| | | | |
|---|---|---|---|
| **1** | ***data format*** | _ | a specification of a physical data structure for a feature or record |
| **2** | ***image depth*** | _ | the numbers of bits stored for each pixel in a digital image |
| **3** | ***import*** | _ | the capability of a GIS to bring data in an external file and in a nonnative format for use within the GIS |
| **4** | ***export*** | _ | the capability of a GIS to write data out into an external file and into a nonnative format for use outside the GIS, or in another GIS |
| **5** | ***internal format*** | _ | a GIS data format used by the software to store the data within the program, and in a manner unsuitable for use by other means |
| **6** | ***node*** | _ | the end of an arc. At first, any significant point in a map data structure. Later, only those points with topological significance, such as the ends of lines |
| **7** | ***snap*** | _ | forcing two or more points within a given radius of each other to be the same point, often by averaging their coordinate |
| **8** | ***arc*** | _ | a line that begins and ends at a topologically significant location, represented as a set of sequential points |
| **9** | ***arc-node*** | _ | early name for the vector GIS data structure |

**3.4 Choose and underline the correct form of the italisized words**.

A surprising number of utility (1)***programmers/programmes*** exist to convert between raster formats. Among them are Image Alchemy and xv. (2)***Many/much*** packages also read and write a huge number of formats. Some will (3)***confirm/convert*** from raster to vector and vice versa, such as CorelDraw. In some cases, this capability is included (4)***without/within*** the GIS package.

Some common raster formats are the Tagged Interchange Format (TIF), which can use run length and other image compression (5)***schools/schemes*** and has a number of different forms that are publicly (6)***available/valueable***; the Graphics Interchange Format (GIF), popularized by the online network services, especially CompuServe (the developers), which uses a quite sophisticated compression scheme on the (7)***data/date part*** of the image; and the JPEG format, which uses a variable resolution compression system offering both partial and full resolution (8)***recovery/ coverage*** depending on the space available.

**3.5 Find the English equivalents to the terms from the above given passage.**

**1** потенциальная возможность _____
**2** работа сети в интерактивном режиме _____
**3** сложная уплотненная схема _____
**4** разрешающая способность переменной _____
**5** восстановление разрешающей _____
**6** (картографический ) пакет

**3.6 Now decide whether the following statements to the text in 3.4 are true (T) or false (F).**

1 Image Alchemy and **xv** are the only utility programmes to be used in raster formats. ___
**2** CorelDraw is a raster format. ___
**3** Many raster formats are popularized by the online network service. ___

## 4 LANGUAGE REVIEW

**4.1 Examine the sentences in the Present Perfect Progressive and the relevant descriptions.**

| | | | |
|---|---|---|---|
| **1** | She is squeezed as an orange. She has been working all day long. | – | emphasis on duration |
| **2** | Who has been reading my business papers? | – | an action which started in the past and continuous up to the present |
| **3** | How long have you been learning English? | – | an action which started and finished in the past and lasted for some time; the result of the action is visible in the present |
| **4** | He has been sorting out the mail for an hour. | – | to express anger, annoyance or irritation |

**4.2 Put the verbs into the correct tense (Present Perfect or Present Perfect Progressive).**

**1** I _____ all your letters. The job's done. (type)
**2** I _____ this report since yesterday and I'm only half way through. (type)
**3** My mother is still in the kitchen. She _____ all morning. (cook)
**4** I _____ a lovely meal which I'll be serving in a couple of minutes. (cook)
**5** We _____ this garage ourselves and have just begun to use it. (build)

**6** We _____ this garage ourselves and hope to finish it within the next two months. (build)
**7** Professor Owen _____ these articles since Monday. (write)
**8** Professor Owen _____ the articles and can send them to the publisher. (write)
**9** Have you _____ Liz this morning? (see)
**10** Have you _____ Liz [reg]ularly, on different occasions? (see)
**11** I _____ The Times because I forgot to buy one today. (not/get)
**12** I _____ The Time because I don't buy it any longer. (not/get)
**13** He _____ English because he has nothing more to learn.(learn)
**14** He _____ English because he has just started to learn this language. (learn)

**4.3 Complete the conversation with the verbs in the correct form: Present Perfect or Present Perfect Progressive.**

John is being interviewed by Mrs Carr for a job working with ……

**Mrs Black:** Come in, Jill. Please sit down. Would you like coffee?
**Jill:** Thank you. Actually I (**1**) *'ve just had* (***just***) one.
**Mrs Black:** Oh good. Now do you know this area at all?
**Jill:** Quite well. I've got friends who live in this town, so I (**2**) _____ (***come***) here for holidays since I was a child. I'm staying with them at the moment, actually.
**Mrs Black:** Oh, that's nice. And do you have a driving licence?
**Jill:** I (**3**) _____ (***drive***) for four years now.
**Mr Black:** And would you say you are a careful driver?
**Jill:** Yes, I think so. At least I (**4**) _____(***have***) never an accident.
**Mrs Black:** Good. Now could you tell me why you think you would be right for this job?
**Jill:** Well, I (**5**) _____ (***be***) always interested in working in the Census Bureau. And I (**6**) _____ (***have***) two jobs dealt with collecting census information.
**Mrs Black:** How do you think you would cope with the job now?
**Jill:** I have an experience as a Census taker. I (7) _____ (***conduct***) surveys with residents on a variety of topics.
**Mrs Black:** That's good. Now, this job isn't permanent, as you know. We need someone for about a year. How would that fit with your long-term plans?
**Jill:** I'd like to work here eventually. And I want some full-time experience too. I (**8**) _____ (***do***) a distance education course in GIS this year. We finish next week, in fact.
**Mrs Black:** When would you be able to start?

**Jill:** As soon as I finish my course.

**Mrs Black:** Excellent. And would you live with your friends?

**Jill:** Well, probably not. I want to rent a small flat. I (**9**) _____ (***look***) in the paper every day, but I (**10**) _____ (***not/find***) anything yet.

**Mrs Black:** Well, if you get the job, we'll try to help you. Now, would you like to come and meet some of your new colleagues?

**Jill:** Oh, yes.

**Mrs Black:** Right, if you'll just follow me then.

**4.4 Complete the sentences using *some* or *any*, or words beginning with *some* and *any (something, anyone,* etc*)*. The first one is done for you.**

**1** 'Who were you talking to?'
'Oh, it wasn't *anyone* you know.'

**2** My uncle has so much money. I wish he'd give me _____ as I never seem to have _____ .

**3** '_____'s been reading my mail!'
'Well, don't look at me. I haven't been _____ near the office all day!'

**4** '_____ to declare, Sir?'
'Well, I've bought _____ perfume for my wife, but they told me in the shop I wouldn't have to pay _____ any duty on it.'

**5** Why don't you bring _____ of your friends to the party? Unless you are doing _____ else of course.

**6** Most people don't have _____ idea of how serious the present economic crisis is. If the Government don't do _____ soon to bring down unemployment then they are not going to have _____ choice but to put up taxes again.

**7** 'But there must be _____ biscuits left! I bought a whole packet yesterday!'
'_____ must have eaten them, then, because there definitely aren't left _____ in the tin.'

**8** 'I feel like going out _____ this weekend.'
'_____ in particular?'
'Not, really. I just need to do _____ different for change.'

**9** 'Did you go _____ last night?'
'No, we had _____ friends round for a meal.'

**10** "Can I help you?'
'Yes, I'd like _____ information about trains from London to Edinburgh, please. Are there _____ early in the morning?'

**11** 'We haven't got _____ milk. Pop out and get _____, would you, please?'

**12** These, without _____ doubt, are _____ of the biggest pumpkins I have ever seen. They should definitely win first prize in the Garden Show.

**4.5 Examine the sentences with *each* and *every* and the relevant descriptions.**

| | | | |
|---|---|---|---|
| **1** | My parents have moved to the capital. Each of them works in a bank. | – | for two things, like both, use each |
| **2** | Each/Every child at the party had a piece of cake.<br>Every child in the world loves the story of Cinderella. | – | sometimes, each = every to refer to more than two<br>(each suggests 'one by one', 'separately';<br>every suggests 'all together') |
| **3** | Nearly every shop is closed today. | – | Practically, Nearly, Almost, Not, etc. + every |
| **4** | Every third-year student will be examined orally in June. They will each be given fifteen minute interview. | – | every ~ all; each ~ individual |
| **5** | You ask me every single day when Joan will be returning and every single day I tell you I do not know. | – | every is used for repeated regular events. |
| **6** | My mother gave me every encouragement when I was a child. | – | every – with a few uncountable things |

**4.6 Supply *each* or *every* in the following sentences. Sometimes both are possible.**

**1** Nearly _____ home in the country has the Internet.
**2** Here is something for _____ of you.
**3** Not _____ student is capable of learning English.
**4** Our motoring organization will give you _____ assistance if you break down.
**5** The admission ticket cost us £5 _____ .
**6** They seem to be repairing _____ road in the country.
**7** _____ road is clearly signposted.
**8** There's a fire extinguisher on _____ flour in the building.
**9** _____ floor in the building has its own fire extinguisher.
**10** They are _____ fortunate to have such a good start in life.
**11** They both did well and they will _____ receive prizes.
**12** You've been given _____ opportunity to do well in this company.
**13** I've phoned him twice, but he's been out on _____ occasion.
**14** I've been phoning him all week, but he's been out on _____ occasion.

## *UNIT SEVEN. GETTING THE MAP INTO THE COMPUTER*

### 1 LEAD IN

**1.** Can you suggest any tips or insights to develop your GIS technician expertise?

**2.** Can one get the map into the computer manually or with special software?

### 1.1 Vocabulary Notes:

tangible – ясный, осязаемый, реальный
virtual – виртуальный, допускаемый, фактический, текущий
to force – вынуждать, принуждать
to fold – складывать, перегибать
to compile – компилировать, составлять
to render – представлять; воспроитзводить, передавать, изображать

### 2 READING

### 2.1 Read the text.

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.

### 2.2 Reading Comprehension.

**1** What do we call a real map?

**2** What is a virtual map?

**3** What is the medium for both types of maps?

### 3 VOCABULARY

### 3.1 Match the left and the right side to make word combinations. Then use the

**word combinations to complete the sentences.**

| | | | | |
|---|---|---|---|---|
| **1** | ___ | a conversion | **a** | of information |
| **2** | ___ | a simple definition | **b** | of books |
| **3** | ___ | an arrangement | **c** | of a map |
| **4** | ___ | pages | **d** | of our everyday world |
| **5** | ___ | maps | **e** | of the virtual map |

**3.2 Fill in the gaps in the table (where possible). Then use one of the parts of speech from the table to complete the following sentences.**

| ***Noun (for person)*** | ***noun (for idea)*** | ***verb*** | ***adjective*** | ***adverb*** |
|---|---|---|---|---|
| _____ | _____ | _____ | printable | ----- |
| _____ | _____ | _____ | drawable | ----- |
| _____ | _____ | _____ | touchable | ----- |
| ------ | _____ | _____ | considerable | _____ |
| _____ | _____ | _____ | arrangable | _____ |

**1** Conditions have improved _____ over the past few years.
**2** We still have to _____ how to get home.
**3** The first _____ of her book was 10,000 copies.
**4** A formal name of a person who writes a cheque is a _____.
**5** A new _____ video system allows the viewers to actively touch a video scene through a force-feedback device.

**3.3 Match the terms on the left with the definitions on the right.**

**1** ___ ***analog*** **a** The conversion of analog maps into computer-readable form. The two usual methods of geocoding are scanning and digitizing.

**2** ___ ***attribute*** **b** A map that has been designed and plotted onto a permanent medium such as paper or film. It has a tangible form and is a result of all of the design and compilation decisions made in constructing the map, such as choosing the scale, setting the legend, choosing the colours, and so on.

**3** ___ ***geocoding*** **c** A characteristic of a feature that contains a measurement or value for the 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.

**4** ___ ***real map*** **d** A map that has yet to be realized as a tangible map; it exists as a set of possible maps. For example, the same digital base map and set of numbers can be entire series of possible virtual maps, yet only one may be chosen to be rendered as a real map on a permanent medium.

**5** ___ ***virtual map*** **e** A representation where a feature or object is represented in another tangible medium. For example, a section of the earth can be represented in analog by a paper map, or atoms can be represented by Ping-Pong balls.

### 3.4 Choose and underline the correct form of the italicized words.

FINGING DATA ON THE NETWORKS

An excellent way to begin a data (1)*surfing/search* is to use a computer network. Several computer packages allow you to do this over the various network (2)*access/input* methods, such as America Online and CompuServe. The most sophisticated (3)*activities/tools*, however, are those available on the Internet. Among the various tools, such as Archie, Veronica, WAIS, and Gopher, is a computer (4)*program/complex* called Mosaic, from the National Supercomputing Center at the University of Illinois. Mosaic allows you to search the World Wide Web (WWW), an (5)*interlinked/interchangeable* 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 (6)*agent/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 (7)*machine/mechanism*.

### 3.5 Read the 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 _____
**7** обновление _____
**8** продавец ГИС _____

## 4 LANGUAGE REVIEW

### 4.1 Identify the tenses in bold. Then match them to the correct tense description.

**1** ___ She **had finished** her homework by the time her mother got home.
**2** ___ He was tired because **he had been working** all day.
**3** ___ He **had been studying** for two years before he got his degree.

**a** past action which happened before the other in the past
**b** past action of a certain duration with a visible result in the past
**c** past action continuing over a period up to a certain time in the past

**Mind the words used with:**
**Past Perfect Simple:** ***by the time, after, before, by five o'clock/midnight,*** **etc.**
**Past Perfect Progressive:** ***for, since***

### 4.2 John, Bill, Mary, Pete, Liz, Ralph, Betty and Sheila haven't seen each other since they left school ten years ago. Here is a list of their jobs and where they live. What do they say to each other when they meet?

| | | | |
|---|---|---|---|
| **1** | John | Leeds | furniture factory |
| **2** | Bill | Australia | farm |
| **3** | Mary | Dublin | travel agency |
| **4** | Pete | Home | no job |
| **5** | Liz | Aberdeen | hospital |
| **6** | Ralph | London | theatre |
| **7** | Betty | Cornwall | hotel |
| **8** | Sheila | Paris | an international bank |

**1** *I've been living in Leeds. I've been working in a furniture factory.*
**2** _____
**3** _____

**4** _____
**5** _____
**6** _____
**7** _____
**8** _____

**4.3 Put the verbs on brackets into the Past Perfect Simple or Past Perfect Progressive**.

**1** By the time we got to the railway station, the train _____ (***already/ go***).
**2** She let me use her laptop after she _____ (***show***) me how to use it.
**3** Margaret _____ (***travel***) for three days before she reached her destination.
**4** Mark_____ (***type***) for so long that his fingers hurt.
**5** He _____ (***save***) for months before he bought a new iPhone.
**6** The team _____ (***practise***) for the competition since January.
**7** She left the room only after she _____ (***look***) everywhere after her missing bracelet.
**8** She _____ (***leave***) before Paul arrived.

**4.4 Choose the correct alternative (Past Simple, Past Progressive or Past Perfect Simple).**

| | |
|---|---|
| **From:** | Nonna@zapnet.com |
| **To:** | GHL@zapnet.com |
| **Cc:** | Margo35@kwikmail.co.uk |
| **Subject:** | INTERNATIONAL STUDENT CONFERENCE |

Hi!

Thought you'd like to know that the conference was very successful. The talks (**1**)***were/~~had been~~*** really interesting and all the speakers (**2**) ***had prepared/prepared*** their material very thoroughly. Everyone agreed we should do the same next year.

However there were some problems with the conference centre. When we (**3**) ***arrive/had arrived,*** we (**4**) ***discovered/had discovered*** that the manager (**5**) ***reserved/had reserved*** the wrong room for us. This meant that we (**6**) ***didn't have/hadn't have*** enough space. Unfortunately, he couldn't let us the larger room because he (**7**) ***gave/had given*** it to another group. Which was even bigger that ours.

He (**8**) ***also misunderstood/had also misunderstood*** the letter explaining what food we (**9**) ***wanted/had wanted***. In fact we (**10**) ***suspected/had suspected*** that he (**11**) ***lost/had lost.*** I don't recommend using that place again!

CU

Nonna

**4.5 Put the verbs in the correct form: Past Simple, Past Progressive or Past Perfect Simple.**

Kylie has called to see her boyfriend Gary.

**Gary:** Kylie. I'm surprised to see you.

**Kylie:** Year? Well, I think you owe me an explanation.

**Gary:** What about you? (1) *I saw* (***I/see***) you in the café last night. (**2**) _____ (***We/arrange***) to meet at the cinema, if you remember.

**Kylie:** So why (**3**) _____ (***you/not/come***) into the café if you saw me?

**Gary:** (**4**) _____ (***I/be***) too angry. And cold. (**5**) _____ (***I/wait***) outside the cinema for three quarters of an hour.

**Kylie:** But why? (**6**) _____ (***you/not/get***) my note?

**Gary:** What note?

**Kylie:** The note (**7**) _____ (***I/leave***) here yesterday afternoon.

**Gary:** What are you talking about?

**Kylie:** (**8**) _____ (***I/go***) past the cinema yesterday lunchtime when (**9**) _____ (***I/notice***) that (**10**) _____ (***they/change***) the film. So (**11**) _____ (***I/put***) a note under your door to tell you.

**Gary:** (**12**) _____ (***I/not/find***) a note.

**Kylie:** It must be here. Let me look. Yes, it's here under the mat.

**Gary:** Oh, right. I'm sorry I was angry. It's just that, well, while (**13**) _____ (***I/wait***), (**14**) _____ (***I/worry***) about (**15**) _____ (***what / happen***) to you. Then (**16**) _____ (***I/see***) you in the café. (**17**) _____ (***You /laugh***) with your friends and (**18**) _____ (***I/realize***) that (**19**) _____ (***you /sit***) there in the warm with them all evening. That's why (**20**) _____ (***I/loose***) my temper.

**Kylie:** Never mind. Let's forget it. Where shall we go now?

**Gary:** What's on the cinema, then?

**Kylie:** A new musical. (**21**) _____ (***My sister/see***) it yesterday. (**22**) _____ (***She/sing***) the theme song all morning.

**Gary:** Oh, you must be tired of hearing it.

**Kylie:** I am. Let's just go and have something to eat, shall we?

**Gary:** Yes, that's a good idea.

**4.6 Write one verb in each sentence in the Pase Simple and the verb in the Past Perfect Simple.**

**1** The ambulance _____ (***leave***) be the time the reporters _____ (***get***) to the scene of the accident.

**2** Before I _____ (***meet***) Dr Christian, I _____ (***see***) a number of specialist.

**3** It _____ (***be***) the second time I _____ (***ever/be***) in a helicopter.

**4** Up to the moment when Mr O'Donnel _____ (***say***) 'You are fired', I _____ (***have***) no idea why he wanted to see me.

**5** When Tonya finished eating, she _____ (***ask***) the waiter to bring the bill.

**6** We _____ (***do***) everything we had to do by five, so we _____ (***decide***) to go out for a coffee.

**7** Luckily I _____ (***just/reach***) the end of my assay when the teacher tell

us all to put our pens down.

**8** I _____ (***not/want***) Mrs Thomas's young son to tough my ornaments because I _____ (***just/clean***) them.

**9** My mom _____ (***be***) annoyed with me because I _____ (***forget***) to get milk when I was at the shop.

**10** I _____ (***get***) Jenny a book for her birthday, but she _____ (***read***) it before.

**4.7 Complete the sentences using *(a) little* and *(a) few* and the words in the box.**

| | | | | |
|---|---|---|---|---|
| ***hotels*** | ***milk*** | ***people*** | ***mistakes*** | ***unemployment*** |
| ***reports*** | ***time*** | ***petrol*** | ***suggestion*** | |

**1** My PA's excellent at typing and makes _____ _____ mistakes.

**2** Yesterday, I had to write _____ _____ on behalf of my boss.

**3** I'd like _____ _____ in my coffee, please.

**4** I love it here. There are _____ _____ I'd rather stay in than this one.

**5** Would you like _____ more _____ to help you?

**6** There's _____ _____ in this region. We are so lucky.

**7** Could you hurry up? We've got very _____ _____

**8** We've got _____ _____ left, so I'm sure we'll get home.

**9** We've had _____ good _____ today, so thank you for these.

**4.8 Choose the correct option.**

**1** We haven't had ***much/ many*** enquiries today.

**2** Do you drink ***much/many*** coffee?

**3** There are ***much/a lot of*** taxies outside the office.

**4** I haven't got ***much/many*** time.

**5** I east a ***lot of/much*** fast food.

**6** We saw ***much/lots of*** good practice in the company.

**7** How ***much/many*** foreign languages do you speak?

**8** There aren't ***many/much*** experienced staff here.

**9** I've got ***a lot of/many*** envelopes, if you need some.

**10** People had ***lots of/much*** good ideas at the meeting.

# *UNIT EIGHT. DIGITIZING AND SCANNING*

## 1 LEAD–IN

**1.** What forms of information can be digitized?

**2.** How do we call the process of conversion of paper maps into digital format usable by computer?

### 1.1 Vocabulary Notes:

| | | |
|---|---|---|
| computer-aided | – | автоматизированный, с использованием ЭВМ |
| to evolve | – | развивать, разрабатывать |
| to involve | – | включать в себя; подразумевать; предполагать |
| to mimic | – | подражать, имитировать |
| wire | – | провод |
| spot light | – | прожектор |
| fine | – | точный |
| to scribe | – | размечать |

## 2 READING

### 2.1 Read Text 1.

DIGITIZING AND SCANNING

Historically, many different means have been used to geocode. At first, some very early GIS packages required maps to be encoded and entered by hand. The hours of monotonous work required for this task made errors common and their correction difficult. Since special-purpose digitizing hardware became available, and especially since the cost of this hardware fell substantially, virtually all geocoding has been performed by computer.

Two technologies have evolved to get maps into the computer. Digitizing mimics the way maps were drafted by hand and involves tracing the map over using a cursor while it is taped down onto a sensitized digitizing tablet. The second method involves having the computer ‘sense’ the map by scanning it. Both approaches work and have their advantages and disadvantages. Most important, the method of geocoding stamps its form onto the data in such a way that many other GIS operations are affected afterwards.

### 2.2 Reading Comprehension.

**1** How were the early GIS packages encoded at first?

**2** What was the disadvantage of encoding by hand?

**3** What two methods were involved to get maps into the computer?

## 2.3 Read Text 2. 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. 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. 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** | манипулятор | _____ |
| **3** | поверхность | _____ |
| **4** | встраивать | _____ |
| **5** | пишущая игла | _____ |
| **6** | ***зд***. Плотно приклеивать с помощью ленты | _____ |
| **7** | устройство преобразования в цифровую форму | _____ |
| **8** | цифровой преобразователь графической информации | _____ |

## 2.4 Read Text 3. 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 _____
**7** материалы с разметкой _____
**8** автоматическая следящая строка _____
**9** контур, очертание _____
**10** предварительно обрабатывать, подготавливать _____

## 3 VOCABULARY

### 3.1 Complete each sentence with the correct form of the word in capital letters.

**DIGIT**

**1** DIGITAL is a market leading _____ media sales company.
**2** Plot Digitizer is a Java program used to _____scanned plots of functional data.
**3** GetData Graph Digitizer is a program for _____ graphs and plots.
**4** Text and images can be _____ similarly.
**5** _____ protects original historical documents and analog records from further deterioration and damage because it eliminates repetitive handling.
**6** _____ means capable of being converted to digital form for distribution via the Internet or other networks

**SCAN**

**1** One way to get graphics and text into a computer is with a _____ .
**2** _____ differs from digitizing in that entire pages of data or map sheets are captured as images all at once.
**3** The first step in digitizing logo or other design is usually import of the _____

image.

**4** People rarely read Web pages word by word; instead, they _____ the page, picking out individual words and sentences.

**5** Web pages have to employ _____ text.

**3.2 Translate the following attributive phrases into your native language. Mind the relationship between the words in a phrase.**

***Example :*** *programming standards*
*computer graphics programming standards*

**1** the GIS's user interface _____

**2** a linear network map _____

**3** the GIS database manager _____

**4** higher-dimension features _____

**5** one-at-a-time geographic operations _____

**6** single-purpose FORTRAN programs _____

**7** specific GIS software packages _____

**8** a higher-dimension geographic feature _____

**9** general spatial properties of features _____

**10** most raw and false-colored satellite image maps _____

**3.3 Choose the correct alternative to complete the paragraph.**

FIELD DATA COLLECTION

An (1)***increasing/increasable*** amount of data for GIS projects comes from a combination of field data, global (2)***positioned/positioning*** system data, and imagery. Field data are collected using standard surveying methods, in which locations are (3)***establishing/established*** in the field as control points and then additional locations, (4)***tracing/traced*** out features or covering terrain, for example, are traced out by large numbers of measurements using instruments (5)***designing/designed*** to measure angles and distances. The highest accuracy instruments, called total stations are digital recorders as well as measurement instruments and use laser ranging to prism reflectors to calculate distance.

## 4 LANGUAGE REVIEW

**4.1 Examine different ways used to describe future events.**

| **Will** | |
|---|---|
| Predictions | *It looks as if John **will get** a new position.* |
| Future facts | *The presentation of a new product **will be** in June.* |
| Decisions made at the moment of speaking | *I know! I'**ll ask** Jimmy for advice.* |

| | |
|---|---|
| Offers | *I'**ll help** you with conducting the negotiations.*<br>B u t<br>***Shall** I(we) **help** you with conducting the negotiations?* |
| Promises | *I promise you I **won't** tell anybody about it.* |
| Requests | ***Will/would/ could/can** you **give** a presentation yourself?* |
| Refusals (*won't*) | *No, I **won't /couldn't/can't give** a presentation myself.* |

| **Be going to** | |
|---|---|
| Predictions based on present evidence | *Look at that wall. It looks as if it'**s going to** fall down.* |
| Intentions | *I'**m going to** get my degree, then get a well-paid job.* |

| **Present Progressive** | |
|---|---|
| Arrangements | *I'**m meeting** Ted on Monday to discuss our business trip.* |
| Intentions | *I'**m asking** for raising my salary tomorrow.* |

| **Present Simple** | |
|---|---|
| Fixed future events (*e.g. timetables, and schedules*) | *The meeting **starts** at 3 p.m. sharp.* |

| **Future Perfect Simple** | |
|---|---|
| Completed situations before a certain time | *It looks as if I **will have lost** my job by the end of the week.* |
| Continuing situations up to a certain time | *This time next month I'**ll have worked** at the company for exactly 20 years.* |

| Future Perfect Progressive | |
|---|---|
| Continuing situations up to a certain time (emphasizes duration) | This time next month, I'll have been working at the company for exactly 20 years. |

| **Future Progressive** | |
|---|---|
| Situation in progress at a certain time in the future | *This time next week I'**ll be flying** to China on business.* |
| Situation which will happen in the future in the normal course of events | *The Managing Director **will be arriving** on Monday.* |

| | |
|---|---|
| Habits or repeated actions at a point in the future | *I think that, in the future, more and more people **will be commuting** to work by electromobiles.* |

**Time Clauses**

| After many time words and phrases, such ***as when, while, once, as soon as***, etc, we do **not** use ***will*** or ***be going to***. | |
|---|---|
| Present simple | *I'll give you a pay rise when you **start** working harder!* |
| Present progressive | *I'll give you a pay rise once you're bringing in three new customers a week.* |
| Present perfect simple | *I'll give you a pay rise as soon as you've proved you're a hard worker.* |
| Present perfect progressive | *I won't give you a pay rise until you've been working here for three years.* |

**Other ways to express the future**

| | | |
|---|---|---|
| ***be (just) about to*** | for the very near future | *I'**m just about to ask** for my pay rise.* |
| ***Be (just) on the point/ verge of*** | for the very near future | *I'**m just on the point/verge of asking** for my pay rise.* |
| ***Be due to*** | for formal arrangements | *I'**m due to meet** my boss at ten o'clock.* |
| ***Be to do*** | for obligations | *You'**re to get** those reports written before Friday!* |
| | For formal announcements | *The factory **is to open** in May.* |
| ***Other modals*** | to express certainty, possibility, etc. | *I **might** ask for a pay rise tomorrow.* |

**4.2 Here are six sentences and six explanations. Match the explanations with the sentences they best describe.**

**1** ___ There is evidence now for the future event.
**2** ___ There is a long-term decision about the future.
**3** ___ Something the speaker thinks is certain to happen.
**4** ___ The speaker's opinion. Or decision or feeling formed at the moment of speaking.
**5** ___ The speaker knows because of something which has already happened, e.g. a decision.
**6** ___ Events fixed by a calendar or an official timetable.

**a** I'm sure there **will be** a party at the end of the course.

**b** I'**m going to visit** my relatives at the weekend.
**c** No, I invited YOU; I'**ll pay**.
**d** Look at the temperature! It'**s going to be** another really hot day.
**e** The London train **leaves** in exactly 7 minutes.
**f** We're moving house next weekend.

**4.3 Complete the sentences with the correct future form using *will, would, can, could, shall , be to do* or *be going to*.**

**1** Do you think that, in the future, people _____ live to be hundreds of years old?
**2** _____ just hold this door open for me for a minute? Thanks a lot!
**3** We _____ to fly to Jamaica in the summer.
**4** _____ we invite Tony and Jim round tonight?
**5** _____ go to John's party next Sunday?
**6** I _____ do the washing-up to night, if you like.
**7** Look out! You _____hit the car in front!
**8** The universe _____ to continue to expand for billions of years.
**9** We've decided we _____ try a new café after the lectures today.
**10** _____ I carry some of these bags for you, or can you manage?

**4.4 Choose the correct answer.**

**1** ___ We are pleased to announce that Emmy Gates _____ replace Melinda Greer as Operations Manager from 15th January.
**a** does **c** is to
**b** is about **d** is due

**2** ___ I _____ Susan for her advice, but I'm not sure that's such so good idea now.
**a** am going to ask **c** was asking
**b** was going to ask **d** will ask

**3** ___ Once _____ broadband, you won't want to go back to a dial-up connection.
**a** you'll be using **c** you have been used
**b** you'll have used **d** you've used

**4** ___ _____ find out more about the costs before we make a final decision?
**a** Do I **c** Shall I
**b** Will I **d** Am I due to

**5** ___ _____ to the Finance Manager or the Accounts Manager?
**a** Will you be reporting **c** Shall you be reporting
**b** Will you have been reporting **d** Are on the verge of reporting

**6** ___ This time tomorrow Williams will _____ across the Pacific for exactly three months.

**a** be rowing **c** row
**b** have rowed **d** have been rowing

**7** ___ When _____ treating me with some respect at work?
**a** will they have started **c** are they starting
**b** are they going to start **d** will they be starting

**8** ___ Were you really just on the point _____ ?
**a** of resigning **c** with resignation
**b** to resign **d** of having resigned

**4.5 Use *both … and, either … or, neither … nor,* or *not only … but also* and rewrite the sentences.**

**1** Diana is going to the meeting, or else Alice is.
_____

**2** David and Daniel are not particularly creative.
_____

**3** Paul will bring the manuals, or else James will.
_____

**4** Anthony hasn't seen the project yet, neither has Charles.
_____

**5** Martin hasn't been to a business trip abroad and Jerry hasn't either.
_____

**6** The dispatcher finds the location of objects. The dispatcher finds the best route.
_____

**7** Henry wants to increase his GIS education; so does Fred.
_____

**8** The expert estimated the efficient use of GIS and so did the rest of the team.
_____

**9** The GIS ability is searching out objects. The GIS ability is displaying objects.
_____

**10** Edward wants to take a geography course in reading and analysis; so does Tom.
_____

# *UNIT NINE. DATA ENTRY*

## 1 LEAD-IN

**1.** What do you think is a data entry operator job description?

**2.** Which of the following four basic procedures for inputting spatial data into a GIS can you do?

- manual digitizing
- automatic scanning
- entry of coordinates using coordinate geometry; and the
- conversion of existing digital data

### 1.1 Vocabulary Notes:

| | | |
|---|---|---|
| to plot | – | составлять план; наносить на план, чертить |
| to skip | – | пропускать |
| to border | – | граничить |
| winding line | – | извилистая линия |
| traffic lane | – | полоса дороги |
| tedious | – | скучный, утомительный |
| be the very meat and potatoes of | – | *разг*. основной, самый важный, насущный |

## 2 READING

### 2.1 Read the text.

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.

### 2. 2 Reading Comprehension.

**1** What does getting the map into the computer result from?

**2** What is an attribute?

**3** What is necessary for GIS analysis?

## 3 VOCABULARY

### 3.1 Look up the following words in your dictionary and find the meanings.

**A**

| | | | |
|---|---|---|---|
| to edit | _____ | to enter | _____ |
| to validate | _____ | to include | _____ |
| to delete | _____ | to capture | _____ |

**B Complete each sentence with the above given words.**

**1** Is there a simple way to _____ all the annotations on a map?

**2** The easiest way to learn how to _____ in ArcMap is to complete the exercises in the right tutorial.

**3** Who could I _____ the spatial data into a GIS?

**4** If I'm using a certain procedure to _____ some data (that is, check how correct/accurate it is), how can I validate the validation procedure itself?

**5** A GIS is a very powerful tool that can be used to_____ , store and analyze geographic data but it is not, by any means, a stand-alone system.

**6** I am creating a pedestrian walking network of a downtown area and I don't know how to _____ polygons as part of a network for Network Analyst (ArcMap)?

### 3.2 Match the terms on the left with the definitions on the right and translate them into your native language.

| | | | |
|---|---|---|---|
| **1** __ | ***server*** | **a** | Two or more computers connected together so that they can exchange messages, files, or other means of communication. A network is part hardware, usually cables and communication devices such as modems, and part software. |
| **2** __ | ***network*** | **b** | A computer connected to a network whose primary function is to act as a library of information that other users can share. |
| **3** __ | ***data entry*** | **c** | A simple model for the organization of numbers. The numbers are organized as a table, with values for variables as entries, records as rows, and attributes as columns. |
| **4** __ | ***editing*** | **d** | The process of entering numbers into a computer, usually attribute data. Although most data are entered by hand, or acquired through networks, from CD-ROMs, and so on, field data can come from a GPS (global positioning system) receiver, from data loggers, and even by typing at the keyboard. |
| **5** __ | ***flat file*** | **e** | The modification and updating of both map and attribute data, general using a software capability of the GIS. |

**3.3 Fill in the blanks with the words given below. Translate the text into your native language.**

| | | | |
|---|---|---|---|
| ***minimum*** | ***consistency*** | ***user*** | ***topology*** |
| ***process*** | ***data*** | ***entry*** | ***systems*** |

EDITING AND VALIDATION

Many early geocoding (1) _____ had only limited editing capabilities. They allowed data (2) _____, but error detection was by after-the-fact processing, and correction was by deletion of records or even whole (3) _____ sets and reentry. Anything we can do in the geocoding (4) _____ that reduces errors, or that makes errors easily detectable, we should indeed do. As an absolute (5) _____ , data for lines and areas can be processed automatically for (6) _____ , and any unconnected lines or unclosed polygons can be detected and signaled to the (7) _____ . The connection between lines, known bordering of areas, and inclusion of points in areas is called map (8) _____ **.** Topology really comes into its own during the map validation stage.

**3.4 Choose the correct form of the word and underline the option. Translate the paragraph into your native language in writing.**

The GIS often allows check plots to be (1)***generating/generated*** that simply plot the label or identification number of the key within a polygon or next to a line. These maps and the tedious process of checking them should never be (2)***skipped/ skipping***. Moving straight on to making elegant graphics or doing a (3)***GIS-basing/GIS-based*** analysis with erroneous data can be anything from embarrassing to dangerous, or even life-threatening**.**

A data set that is correctly geocoded both positionally and with attributes is not necessarily logically consistent. Logical consistency can be (4) ***checked/checking*** most easily for topological data. Topologically, data can be checked to see that all chains intersect at nodes, that chains cycle correctly in a ring around polygons, and that inner rings are fully (5)***enclosing/enclosed*** within their surrounding polygons. Otherwise, attributes can be checked to ensure that they fall within the correct range and that no feature has become too small to be (6)***represented/representing*** accurate, correct.

## 4 LANGUAGE REVIEW

### 4.1 Match the sentence to the relevant form of the Passive.

| | | | | |
|---|---|---|---|---|
| **1** | ___ | Any emails you send to me ***are copied***. | **a** | present simple |
| **2** | ___ | The meeting ***is being chaired*** by Alice Robinson. | **b** | present continuous |
| **3** | ___ | The errors in the data ***were easily detected***. | **c** | past simple |
| **4** | ___ | A data set ***was being checked*** when we detected another error. | **d** | past continuous |
| **5** | ___ | Sarah ***has*** already ***been informed*** about the message. | **e** | present perfect simple |
| **6** | ___ | I thought that you ***had been told*** the news. | **f** | past perfect simple |
| **7** | ___ | The parcel ***will be delivered*** in two days. | **g** | future simple |
| **8** | ___ | The Internet service ***will have been changed*** by Monday. | **h** | future perfect simple |
| **9** | ___ | I want ***to be promoted*** for a new position. | **i** | present infinitive |
| **10** | ___ | The report should ***have been delivered*** last week. | **j** | perfect infinitive |
| **11** | ___ | I enjoy ***being praised*** by people. | **k** | simple –***ing*** form |
| **12** | ___ | Good technical support ***having been provided***, t hey could increase the order. | **l** | perfect –***ing*** form |
| **13** | ___ | The meeting ***should be opened*** on time**.** | **m** | modals + ***be*** + past participle |

### 4.2 Match the sentences in the Passive to the relevant description.

| | | | | |
|---|---|---|---|---|
| **1** | ___ | The new hospital ***will be opened*** by the Queen on May 15th. | **a** | the person, who carries out the action, is unknown, unimportant or obvious from the content |
| **2** | ___ | Our house ***was built*** in 1990. | **b** | the action itself is more important than the person who carries it out (as in news headlines, newspaper articles, formal notices, instructions, advertisements, etc.) |
| **3** | ___ | A lot of mistakes ***have been made***. | | |
| **4** | ___ | Two teenagers ***were*** Seriously ***injured*** in a car accident last night. | **c** | we refer to an unpleasant event and we do not want to say who or what is to blame (or we want to make statements more polite) |
| **5** | ___ | My new laptop ***is damaged.*** | | |
| **6** | ___ | ***Is*** this room ***cleaned*** every day? | | |

**4.3 Complete the second sentence so that it has a similar meaning to the first sentence. Do not use *by* unless it is important to the meaning.**

**1** The secretary has checked all letters.
All letters *have been checked.*

**2** The interviewer kept the candidates waiting for half an hour.
The candidates _____

**3** The students must pay their own fees for this course.
All the fees for this course_____

**4** Do you suppose your manager could have sent that email?
Do you suppose that email _____

**5** People use word processors for writing all kinds of documents nowadays.
Word processors _____

**6** During the high season, the hotel was accommodating more guest every week.
During the high season, more guest _____

**7** Nobody informed the operator that files had not been saved.
The operator _____

**8** Where will your company send you next year?
Where will you _____

**9** The search on the Internet captured Jessica.
Jessica _____

**10** I've still got the lap-top because no-one claimed it.
I've still got the lap-top because it _____

**11** Has anyone asked you about your opinion?
Have you _____

**12** You shouldn't have typed the email in all upper case.
The email _____

**13** All visitors must wear identity budgets.
Identity budgets _____

**14** Someone must have changed the venue of the presentation.
The venue of the presentation _____

**15** Is anyone using this computer?
Is the computer _____

**4.4 Complete the second sentence so that it has a similar meaning to the first sentence.**

**1** It is said that a new job needs a person with computer skills.
A new job is said to need a person with computer skills.

**2** It is thought that the authorities had strong differences of opinion.

The authorities _____ .

**3** It was alleged that boys had earlier experience with computers.
The boys _____ .

**4** It is reported that the chief executive is resigning.
The chief executive _____ .

**5** It is expected that the market research will be finished soon.
The market research _____ .

**6** It is generally considered that sixteen is too young to get married.
Sixteen _____ .

**7** It was thought that everyone in the company was treated fairly.
Everyone _____.

**8** It is believed that the company had been developing a new product for a year.
A new product _____ .

**9** It is reported that the building has been badly damaged by then fire.
The building _____ .

**10** It is alleged that the man was driving at 110 miles an hour.
The man _____ .

**4.5 Match the rules of the usage of adjectives to the relevant sentences.**

| | | | |
|---|---|---|---|
| **1** | __ Adjectives describe nouns. | **a** | They seem ***unhappy***. |
| | | **b** | It is a ***warm*** day. |
| | | **c** | She is ***beautiful***. |
| **2** | __ Adjectives show what a person thinks of somebody or s omething (opinion adjectives). | **d** | It was a ***pleasant*** evening. |
| | | **e** | I've got a ***valuable*** book as a present. |
| **3** | __ Adjectives give factual information about age, size, colour, origin, material etc. (fact adjectives). | **f** | There is an ***old black*** telephone on the table. |
| | | **g** | The people are skiing on the ***crisp white*** snow. |
| **4** | __ Nouns are used as adjectives before other nouns. | **h** | Judy wears too much ***eye*** make-up to the office. |
| | | **i** | Could I borrow your ***telephone*** book for a minute? |
| **5** | __ There are compound adjectives formed with | **j** | I often think of that never-***ending*** journey. |

a) present participle (V4)
b) past participle (V3)
c) cardinal numbers + nouns

**6** __ Adjectives may have difference in meaning.

**k** ***broken***-down washing machine

**l** The reason of failure was in his ***three-hour*** delay.

**m** He gave her a ***gold*** ring.
(= ring made of gold)
They walked on the ***golden*** sand.
(= sand the colour of gold)

**4.6 Put the following into the correct order.**

**1** suede / Italian / new / red / soft / shoes
**2** elderly / tall / Englishman
**3** oval / Venetian / ancient / valuable / glass
**4** shiny / large /expensive / brown / leather / case
**5** square / wooden / old / nice / table
**6** modern / stone / large / beautiful / cottage
**7** porcelain / tea / blue / thin / old / cup
**8** young / blonde / handsome / tall / man
**9** old / several / English / beautiful / castles
**10** pretty / French / young / a lot of / girls
**11** dark blue / best / silk / my / shirt
**12** young / many / factory / German / workers

**4.7 Give the comparative and superlative forms of each word. Remember that these adjectives of two syllables can make their comparative and superlative either with *–er/-est*** or **with *more/most*. Make up at least three sentences of your own with some of the given adjectives.**

| | | | |
|---|---|---|---|
| ***clever*** | _____ | ***narrow*** | _____ |
| ***common*** | _____ | ***pleasant*** | _____ |
| ***cruel*** | _____ | ***polite*** | _____ |
| ***expensive*** | _____ | ***quiet*** | _____ |
| ***friendly*** | _____ | ***simple*** | _____ |
| ***gentle*** | _____ | ***stupid*** | _____ |
| ***happy*** | _____ | ***tired*** | _____ |

***1.*** _____
***2.*** _____
***3.*** _____

**4.8 Fill in the blanks with the correct comparative or superlative forms.**

**1** My project was _____ in my team. (***bad***)
**2** Istanbul is one of _____ cities in the world. (***cosmopolitan***)
**3** Some people want a _____ house than they had before. (***large***)
**4** What's _____ place in the world? (***far***)
**5** I think London is much _____ Oxford. (***quiet***)
**6** My friend is _____ person in our company. (***generous***)
**7** Pam is _____ any other person. (***polite***)
**8** Many people seek a _____ way of life than they have. (***healthy***)
**9** You are _____ (***sweet***) and _____ (***funny***) person in the world.
**10** On Tuesdays, Antony has _____ business hours. (***short***)

**4.9 Complete these sentences from a newspaper. Use *the +adjective* or *the +adjective+ noun* in brackets ( e.g. *the hungry* or *the hungry people*).**

***Examples:***
- Rich nations can afford to feed ***the hungry*** (***hungry***). (*in general*)
- ***The homeless people*** (***homeless***) whose story appeared in this paper last week have now found a place to live.
  (*a specific person or a specific group of people)*

**1** _____ (***sick***) need to be looked after, so money must be spent on hospitals.
**2** Life must be hard for _____ (***unemployed***) in our society today
**3** What is the government doing to help _____ (***poor***)?
**4** _____ (***homeless***) usually have great difficulty in getting a job.
**5** There is a special television programme for _____ (***deaf***) every Sunday morning.
**6** Some of _____ (***young***) at the youth club here are running in a marathon.
**7** There was a fire at a nursing home in Charles Street, but none of _____ (***old***).

**4.10 Complete the sentences using different comparative patterns: (*less*+ adjective, *much/much more/ far/ a bit/ a lot/ a little/ any* + comparative adjective).**

**1** John and Jack normally have lots to do, but they're _____ busy this week.
**2** The supermarket is _____ _____ expensive than the shop.
**3** Rita's new flat is _____ convenient for shopping.
**4** Your coat is _____ longer than is a fashionable coat.
**5** It's _____ faster by tube. A bus is _____ chreaper than a taxi.
**6** It was _____ colder than today.

**7** Are you sleeping _____ better since you've been taking the pills?
**8** I got up _____ later than usual.
**9** If we leave _____ later than seven, we'll get caught in the rush hour.
**10** I left wor k _____ earlier this afternoon.

**4.11 Complete the sentences using the structures of comparison *so* and *such, enough* and *too.***

MY FIRST – AND LAST! – DAY AT WORK

I'll never forget my first day at work. It was (1) _____ a disaster that I lost my job! The boss explained what I had to do, but she did it (2) _____ quickly that I didn't understand. I wasn't brave (3) _____ to ask her to repeat it, so I pretended I knew what to do. It wasn't difficult at first – just putting numbers into a computer. Soon, though, I was (4) _____ busy that I started making more and more mistakes. I made (5) _____ a lot of mistakes that the other workers noticed. They tried to help me, but it was (6) _____ late. In the end, I just had (7) _____ much to do that I gave up. I sat there and stared at my computer for two hours! The boss came back and she was (8) _____ shocked that she fired me immediately! My first day was also my last!

**4.12 Complete each sentence with *as … as, not so … as, the same as.***

**1** The other students learn more quickly than me.
I don't learn _____the other students.
**2** You're very angry and I'm very angry also.
I'm _____ you.
**3** The price for the seats at the front is expensive (high). The price for the seats at the back is expensive too.
The price for the Seats at the front is _____the price for the Seats at the back .
**4** Central Park in New York is bigger than Hyde Park in London.
Hyde Park in London isn't _____Central Park in New York.
**5** Her last film is very good and her new film is also very good.
Her last film is _____her last film
**6** The report of Mr Smith was very short. The John's report was very short too.
The report of Mr Smith was _____ the John's report.

**4.13 Complete the sentences with *'the … the'*. Use the expressions given after the model.**

| | | | |
|---|---|---|---|
| ***older, longer*** | ***less, dangerous*** | ***less, longer*** | ***more, more*** |
| ***less, warmer*** | ***darker, more*** | ***more, longer*** | ***less*** |

**1** _____ he drove, _____ we laughed.
**2** _____ I live here, _____I like it.
**3** _____ I get, _____ my hair gets.
**4** _____ money he lost, _____ it made him unhappy.
**5** _____ I learn, _____ I forget and _____I know.
**6** _____ I get to know you, _____ I understand you.
**7** _____ clothes she buys, _____ clothes she wants to buy.
**8** _____ money he has, _____ useless things he buys.
**9** _____ it got, _____ time we spent on the beach.
**10** _____ he reads, _____ he forgets.
**11** _____ she ignores him,_____ he loves her.
**12** _____ he drives, _____nervous he gets.
**13** _____ it is, .._____ I like it.
**14** _____ money we spent, _____ friend we have.
**15** _____ I sleep, _____ tired I am.

## *UNIT TEN. BASIC DATABASE MANAGEMENT*

### 1 LEAD-IN

**1.** Do you agree that the main components of a database management system are as follows:

- Data (Accurate data, in a form that can be fed into the software programme)
- Hardware (with enough power to run the GIS software)
- Software (with the capabilities you need)
- Users (trained to use the GIS system)

**2.** What do you think is the purpose of data management in GIS?

### 1.1 Vocabulary Notes:

| | | |
|---|---|---|
| toolbox | – | *зд*. Пакет вспомогательных программ |
| retrieval | – | поиск, выборка (данных) |
| trivial | – | обыденный, банальный; ненаучный |
| directory | – | указатель, справочник, руководство |
| a construct | – | конструкция, структура |
| to relate | – | относиться, иметь отношение |

### 2 READING

**2.1 Read the text.**

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 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.***

### 2.2 Reading Comprehension.

**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?

## 3 VOCABULARY

### 3.1 Match the left and the right side. Read the terms and the definitions and translate them into your native language.

| | | |
|---|---|---|
| **1** __ ***database*** | **a** | The part of the DBMS (database management system) 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. |

| | | | |
|---|---|---|---|
| **2** | __ ***data model*** | **b** | A catalog of all the attributes for a data set, along with all the constraints placed on the attribute values during the data definition phase. Can include the range and type of values, category lists, legal and missing values, and the legal width of the field. |
| **3** | __ ***data entry*** | **c** | The process of entering numbers into a computer, usually attribute data. Although most data are entered by hand or acquired through networks, from CD-ROMs, and so on, field data can come from a GPS (global positioning system) receiver, from data loggers, and even by typing at the keyboard. |
| **4** | __ ***data dictionary***: | **d** | A logical means of organization of data for use in an information system |
| **5** | __ ***data definition language*** | **e** | Any collection of data accessible by computer. |

**3.2 Write the English equivalents to the words and phrases from 2.1 above. Learn the terms to use in your further practice.**

| | | |
|---|---|---|
| **1** | точно определять; задавать | _____ |
| **2** | ограничение целостности | _____ |
| **3** | допустимое значение | _____ |
| **4** | приобретенные, обнаруженные данные | _____ |
| **5** | устройства регистрации данных | _____ |
| **6** | логическое средство организа–ции данных | _____ |

**3.3 Chose the correct form of the word and underline the option. Translate the paragraph into your native language in writing.**

The database management system's (DBMS's) heritage is (1)***form/from*** within computer science, but the user community is as(2)***bread/broad*** as that of GIS, literally (3)***millions/millennium*** of firms, accountants, colleges and universities, banks, and so forth (4)***then/that*** need to keep and organize records by computer. The earliest database management systems (5)***data/date*** from the efforts of the early 1970s, (6)***when/where*** large mainframe computers were used, data-entry was by key punch and punched (7)***cords/cards***, and the technology was called automatic data processing.

**3.4 Match the two parts to make up the sentences. The first one has been done for you.**

| | | | | |
|---|---|---|---|---|
| **1** | __ | The most basic management function is | **a** | the user to set up a new database |
| **2** | __ | The data definition language allows | **b** | to get information about the locations. |
| **3** | __ | The data dictionary | **c** | data entry. |
| **4** | __ | All data entry | **d** | is a catalog of all of the attributes. |
| **5** | __ | You can use GIS | **e** | is subject to error. |

## 4 LANGUAGE REVIEW

**4.1 Match the types of adverbs to the relevant sentences with adverbs.**

| | | | |
|---|---|---|---|
| **1** | adverbs of **manner** | **a** | Do you come here ***often***? |
| | | **b** | Jackson ***often*** complains about his salary. |
| | | **c** | Tommy is ***usually*** prepared. |
| **2** | adverbs of **degree** | **d** | We have ***finally*** decided not to negotiate. |
| | | **e** | ***Yesterday*** was the last day of my vacation**.** |
| | | **f** | Has she ***already*** mailed the message? |
| **3** | adverbs of **frequency** | **g** | She smiled ***happily***. |
| | | **h** | They are ***eagerly*** waiting for a message. |
| | | **i** | He never acts ***foolishly***. |
| **4** | adverbs of **time** | **j** | He has ***almost*** finished the report. |
| | | **k** | They are ***completely*** exhausted from the trip. |
| | | **l** | I'm ***too*** tired to go out tonight. |
| **5** | adverbs of **opinion** | **m** | I've known Susan ***for five years.*** |
| | | | I haven't seen him ***since January.*** |
| | | | I arrived here ***two months ago***. |
| | | **n** | I'll wait here ***till (until)*** 7 o'clock. |
| | | | She won't arrive ***by*** 5. |
| | | **o** | We had a lot of fun ***during/in*** the holidays. |
| | | | We stayed in Paris ***for a week***. |
| **6** | adverbial phrases of **duration** | **p** | Please, leave your car ***here***. |
| | | **q** | We couldn't find you ***anywhere***. |
| | | **r** | Let's go ***indoors*** and have something to eat. |
| **7** | adverbs of **place** | **s** | ***Hopefully*** the situation will get better. |
| | | **t** | Her work record is ***quite honestly*** awful. |
| | | **u** | ***In actual fact*** I think she's wrong. |
| **8** | adverbs of ***reason*** | **v** | He didn't work hard, ***therefore***, he failed. |
| | | **w** | Most of the evidence was destroyed in the fire. |

***Thus*** it would be almost impossible to prove him guilty.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | ___ | ___ | ___ | **3** | ___ | ___ | ___ | **5** | ___ | ___ | ___ | **7** | ___ | ___ | ___ |
| **2** | ___ | ___ | ___ | **4** | ___ | ___ | ___ | **6** | ___ | ___ | ___ | **8** | ___ | ___ | |

**4.2 Examine the following table. Mind the position of adverbs in the sentence. Underline all types of adverbs and translate the sentences into your native language.**

| ***Front position*** | ***Mid position*** | ***End position*** |
|---|---|---|
| *Finally* he could stand the noise no longer. | We *almost* missed our way. | He worked in the room *quietly.* |

**1** I expect Sue to win the race easily.
**2** He greatly regretted missing the concert.
**3** I secretly hated playing the piano.
**4** She kindly offered to do the work.
**5** I don't pretend to understand instructions completely.
**6** As a result, Japan faces crises.
**7** Tomorrow the weather will be much cooler.
**8** We considered the probable briefly.
**9** I first met him in 1995.
**10** Next, add three teaspoons of sugar.

**4.3 Supply the right adverb of manner. Some adverbs end in *–ly* and some do not.**

**1** She's a ***hard*** worker. She works _____ .
**2** He's a ***fast*** runner. He runs _____ .
**3** This is an ***airmail*** letter. Send it _____.
**4** The train is ***early***. It has arrived _____.
**5** My name is ***last***. I come _____ .
**6** The bus was ***late***. It came _____ .
**7** I get a ***monthly*** bill. I pay _____ .
**8** He's a ***quick*** thinker. He thinks _____ .

**4.4 Answer each question in full putting the adverb of frequency a) in the middle and b) at the beginning.**

**1** Do you ever bring work home from the office? (often)
*I often bring work home from the office. Often, I bring work home.*
**2** Does John leave home before his wife does? (***normally***)

_____

**3** Have ever forgotten to lock the back door? (***frequently***)

_____

**4** Do you know when to wake up? (***usually***)

_____

**5** Are the one who pays bills? (***generally***)

_____

**6** Is the traffic heavy in the morning? (***often***)

_____

**7** Do ever have power cuts? (***sometimes***)

_____

**8** Are there complains about the service? (***often***)

_____

**4.5 Complete each sentence using the correct adverb of degree in brackets. Sometimes either word is possible. Consult the following scheme.**

| _____ | • | _____ | •• | _____ | ••• | _____ | •••• | _____ |
|---|---|---|---|---|---|---|---|---|
| | ***fairly good*** | | ***quite good*** | | ***rather/pretty good*** | | ***very good*** | |

***Examples*:** She's ***quite*** a generous woman. (***quite/fairly***)
It's ***rather/fairly*** cold in this room. (***rather/fairly***)

**1** I've made _____ a stupid mistake. (***pretty/rather***)
**2** She _____ enjoys working at night. (***fairly/quite***)
**3** It was a _____ boring report of the company activity. (***pretty/rather***)
**4** I'm _____ looking forward to the party on Saturday. (***pretty/quite***)
**5** The weather was _____ worse than we'd expected. (***quite/rather***)
**6** Mr Spenser speaks English _____ well, doesn't he? (***quite/ pretty***)
**7** I'm feeling _____ better today. (***fairly/ rather***)

**4.6 Put in the adverbs of duration *during, in, by, till, since, for* or *ago* to complete the passage .**

**PEACE AND QUIET**

I moved to this area seven years (**1**) *ago*, (**2**)_____ years I have had noisy neighbours. Ever (**3**) _____ I moved into this flat, I've had to put up with noise (**4**) _____ the night. I decided I'd had enough and I've been looking for a new flat (**5**) _____ the beginning of the year. I haven't found anything (**6**) _____ now. Every week I go to the local estate agent's office, but it's the same story. "I might have

something (**7**) _____ the end of the week," he says, or, "Wait (**8**) _____ next week. I think I might have a few flats (**9**) _____ then." I've seen a few flats (**10**) _____ my search, but I don't like any of them. One flat I saw has been empty (**11**) _____ two years. "It's got a busy road on one side and a railway on their other!" I exclaimed. "I want peace and quiet." Last week I visited the agent again. "I won't leave (**12**) _____ you show me something," I said. He smiled and said, "I've got just the flat for you." I went to see it and I was horrified. "But it's next to a cemetery!" I cried. "But you won't have noisy neighbours," my agent said." It's ideal for peace and quiet!"

**4.7 Adverb position.**

**A Complete this e-mail by placing the adverbs in the correct position on each line.**

| | |
|---|---|
| Hi! Thanks for your last e-mail. I'm sorry I haven't | ***very*** |
| got back to you sooner but we've been rushed | ***terribly*** |
| in the office. We seem to be so busy. | ***always*** |
| It seems the launch has been successful, | ***remarkably*** |
| beyond our wildest dreams in fact. We are delighted | ***obviously*** |
| and we have had a large order from a company | ***already*** |
| in China. This is fabulous news. See you soon. | ***absolutely*** |

**B Insert the adverbs into each line of this message in the most natural position.**

| | |
|---|---|
| Thank you for the e-mail you sent. I have spoken to Eric | ***yesterday;already*** |
| but he says he is waiting for confirmation from the board | ***still*** |
| before we can go ahead with the proposed changes. The delay | ***quite frankly*** |
| is getting on my nerves but I hope to get started on the project. | ***very soon*** |
| As is the case, we will receive confirmation at the last | ***often; suddenly*** |
| minute and have to work for the next couple of months | ***flat out*** |
| in order to get into production. | ***fast*** |

**4.8 Read the conversation between colleagues. Complete it with the comparative and superlative forms of the words in brackets. Add *the* and *than* where necessary.**

**Billy:** Did you hear about that new speed-typing course? It helps you type (**1**) …*faster*… (***fast***) and (**2**) _____ (***well***).

**Michael:** I don't believe it! The (**3**) _____ (***fast)*** you type, the (**4**) _____ (***many***) mistakes you make .

**Billy:** The advert says that after the course, you'll type ten times (**5**) _____ (***rapidly***) and can do five times more typing. And the best thing is that you won't have to work any (**6**) _____ (***hard***).

**Michael:** I'd like to see that. Not long ago I typed (**7**) _____ (***slowly***) of any colleague in my office and I remember that my practice (**8**) _____ (***clear***).

**Billy:** Maybe you could type even (**9**) _____ (***quickly***) that. That way, you'd have more time to do your paperwork.

**Michael:** Did you read the course description (**10**) _____ (***proper***)?

**Billy:** I read it (**11**) _____ (***thoroughly***) I read most things.

**4.9 Underline the correct item. Mind the difference in meaning between the following pairs of adverbs:**

| | |
|---|---|
| ***hard*** = *with effort* | ***hardly*** = *scarcely* |
| ***near*** = *close* | ***nearly*** = *almost* |
| ***late*** = *not early* | ***lately*** = *recently* |
| ***high*** = *at a high level* | ***highly*** = *very* |
| ***free*** = *without charge* | ***freely*** = *without restraint* |

**1** We speak ***high/highly*** of our teachers.
**2** Please, open the window ***wide/widely***.
**3** John ***badly/bad (***very) needs this job.
**4** It is ***nearly/near*** five o'clock. I ***nearly/near*** missed the train.
**5** John came too ***late/lately***.
**6** Most experts think ***deep/deeply*** about what their responsibilities are.
**7** Come on, time is running ***short/shortly***!
**8** Everything is going ***right/rightly*** for him at the moment.
**9** They speak *free/freely* English.
**10** They got this printer free/freely with a magazine.
**11** There were so many people in the exhibition hall that we could *hard/hardly* here what the presenter was saying.
**12** We tried *hard/hardly* to reduce our expenses, but we couldn't do it.

## *UNIT ELEVEN. SEARCHES BY THE ATTRIBUTE*

### 1 LEAD–IN

**1.** What information do you need , if you want to create a map?

**2.** What does spatial data involve?

### 1.1 Vocabulary Notes:

| | | |
|---|---|---|
| output | – | выходные данные, результаты |
| layout | – | размещение, компоновка; формат |
| report generator | – | формирователь отчетов |
| retrieval | – | поиск, выборка |
| to browse | – | просматривать |
| a browse | – | программа просмотра |
| subset | – | подмножество |
| assign | – | присваивать, назначать (значения) |
| database management system (**DBMS**) | – | система управления базой данных |
| query | – | запрос |

### 2 READING

### 2.1 Read the text.

SEARCHES BY THE ATTRIBUTE

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.

### 2.2 Reading Comprehension.

**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?

## 3 VOCABULARY

### 3.1 Read and translate key terms and their definitions.

***browse*** – A method of search involving repeated examination of records until suitable one is found**.**

***compute*** – Data management command that uses the numerical values of one or more attributes to calculate the value of a new attribute created by the command.

***find*** – A database management operation intended to locate a single record or a set of records or features based on the values of their attributes.

***renumbering*** – Use of the DBMS to change the ordering or ranges of attributes.

***overlay*** – A G1S operation in which layers with a common, registered map base are joined on the basis of their occupation of space.

***restrict*** – Part of the query language of a DBMS that allows a subset of attributes to be selected out of the flat file.

***identify*** – To find a spatial feature by pointing to it interactively on the map with a pointing device such as a mouse.

***highlight*** – A way of indicating to GIS user a feature or element that is the successful result of a query.

**3.2 Match the terms on the left with their definitions on the right**.

| | | | | |
|---|---|---|---|---|
| **1** | __ | database | **a** | data about data, usually for search and reference purposes |
| **2** | __ | data model | **b** | a procedure for checking the values of attributes for all records in a database against their correct values |
| **3** | __ | polygon | **c** | any collection of data accessible by computer |
| **4** | __ | metadata | **d** | a single entity that composes part of a landscape |
| **5** | __ | feature | **e** | a number, value, text string, or other value required as the consequence of submitting a command to the GIS |
| **6** | __ | attribute | **f** | a many-sided area feature consisting of a ring and an interior (an example is a lake on a map) |
| **7** | __ | verification | **g** | a simple model for the organization of numbers; the numbers are organized into a table, with values for variables as entries, records as rows, and attributes as columns |
| **8** | __ | parameter | **h** | the logical means of organization of data for use in information system |
| **9** | __ | flat file | **i** | a loose data structure for vector data, with only order as an identifying property to the features |
| **10** | __ | cartographic spaghetti | **j** | 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 |

**3.3 Read the text. Find the English equivalents to the terms given below**.

**1** взаимодействие по запросу _____

**2** выполнять команды _____

**3** диалог в пакетном режиме _____

**4** диалог; обмен данными _____

**5** команда для завершения (вычисления) _____

THE QUERY INTERFACE

Both database management and geographic information management share the fact that the user must somehow interact with the data in an appropriate way. The first generation of DBMS and G1S both used only batch-type interaction with the data, usually closely linked to working with the operating system, the physical management of disk, and so on. This type of interaction dates from the punched card,

in that all processes had to be thought out in advance and a file (or stack of cards) produced that could execute the different commands one at a time.

When interactive computing became commonplace, the command line as a query vehicle for data query took over. Commands were typed into the computer one at a time, under the control of the DBMS itself, and the software responded by performing the computations one at a time while the user waited for the command to be completed. Many GISs still use this type of interaction, or permit it to allow the use of macros. ***Macros*** are files containing commands to be executed one at a time. If an error is detected in a macro, the execution can be stopped and the file modified to correct the mistake.

**3.4 Choose the correct form of the word and underline the option. Translate the paragraph into your native language in writing.**

US (1)***pockets/packages*** now are fully integrated with the WIMP (windows, icons. Menus, and pointers) interface specified by the (2)***opening/operating*** system, such as Windows or X-Windows. (3)***Choices/chances*** are now most commonly made by menu, with (4) ***merry/message*** windows popping up for the user to provide essential (5)***papers/parameters*** when they are required. Values can also sometimes be set by sliders, widgets, and by screen tools such as dials, choice lists, and buttons.

## 4 LANGUAGE REVISION
## MODAL VERBS

- **Prohibition** **(*mustn't-can't*)**
- **Obligation / Duty / Necessity** **(*must-have to-should/ought-need*)**
- **Absence of necessity** **(*needn't/don't have to, didn't need to – needn't have done)***

**4.1 Fill the gaps with *needn't have* or *didn't need to* and the correct form of the verb in brackets.**

**1** I ran all the way to work, but I ...*needn't have hurried*... (***hurry***) because I was the first person to arrive.
**2** We _____ (***hurry***), so we stopped to have lunch on the way.
**3** I went to the Academy today, but I _____ (***go***) as all the lectures were cancelled.
**4** I _____ (***ask***) the way to the Information Centre, since I'd been there before.
**5** I _____ (***buy***) any food, so I didn't go to the supermarket.
**6** I _____ (***buy***) any food after all, because we had plenty at home.
**7** I _____ (***pack***) my shorts, as it rained all week. We _____ (***pack***) many things, as we would only be away for one night.

**4.2 Fill in the gaps with *must, mustn't* or *needn't/don't have to*.**

**1** **A:** You ...*must*... study hard to pass the test.
**B:** I know. I study every evening.
**2** **A:** You _____ be late for your job interview.
**B:** I know. I'll leave early so as to get there on time.
**3** **A:** Shall I collect the children from the party?
**B:** No, you _____ collect them. Mr Ellis is giving them a lift home.
**4** **A:** Do you want me to wait for you after work?
**B:** No, you _____ wait. I can walk home by myself.
**5** **A:** You _____ interrupt while people are talking.
**B:** No. It's very bad manners to do that.
**6** **A:** My dog has been ill all week.
**B:** Oh dear! You _____ take him to the vet.
**7** **A:** It's Sally's birthday on Wednesday.
**B:** I know. I _____ remember to buy her a present.
**8** **A:** Shall I wash the dishes for you?
**B:** No, you _____ do that. I'll do them later.

**4.3 Supply the forms *must* or *have (got) to* which '*feel right*' in the sentences. Sometimes more than one form is possible.**

We really _*must*__ do something about having this house decorated.

**1**
**2** We _____ pay this electricity bill by the end of the week.
**3** You _____ write and let us know you've arrived safely.
**4** I _____ be at my desk by 9.00 every morning.
**5** We always _____ clock in when we arrive at work.
**6** ALL VISITORS _____ REPORT TO THE DUTY OFFICER.
**7** _____ you always slam the door when you come in?
**8** You really _____ come and see the new extension to our house some day.

**4.4 Use a construction with *have to* in place of the words in italics.**

**1** ***It will be necessary for him*** to try harder if he wants to win the prize.
___*He will have to*_____
**2** ***It has been necessary for them*** to save hard to buy their new hi-fi.
_____
**3** Because of the snow ***she has been finding it necessary*** to walk to college.
_____
**4** ***It had already been necessary for us*** to clear the office floor twice before the

boss asked us to clear it again. _____

**5** ***It would have been necessary for me*** to pay twice as much to travel first class. _____

**6** ***We are finding it necessary*** to cut back on staff because of a shortage of orders. _____

- **Ability** **(*can-could- be able to/was able to*)**
- **Lack of ability** **(*can't-couldn't/wasn't able to*)**
- **Logical assumption** **(*must-can't/ couldn't*)**
- **Probability** **(*should/ought*)**

**4.5 Fill in the gaps with *can, can't, could, couldn't* or *was/wasn't able to* to express ability or lack of ability.**

**1** I had my hands full, so I ...***couldn't/wasn't able to***… open the door.
**2** When I was young, I _____ stand on my head.
**3** Although he felt ill, he _____ finish all the paperwork.
**4** Tony is clever. He _____ speak three languages.
**5** I _____ afford that bag. It's too expensive.
**6** Although it was dark, he _____ find his way through the woods.
**7** I heard his voice calling me, but I _____ see him.
**8** We're busy tonight, so we _____ come to the party.
**9** When I entered the house, I _____ smell fresh bread baking.
**10** I _____ drive a car. I learnt when I was eighteen

**4.6 Identify the use of the modal verbs expressing logical assumption and underline them**.

**Example:** They must have gone out; the lights are off. (positive/present)
He could be exhausted. (positive/past)
They can't have lied. (negative/present)
They couldn't have been friends. (negative/past)

**1** She must have lost the race.
**2** She could be considering your offer.
**3** They couldn't have gone out so late.
**4** She can't be feeling well
**5** She must have worked late last night; she looks exhausted.
**6** You can't have done it! It's so stupid!
**7** He must have taken your car since he has the keys.

**8** He could have won the competition.
**9** You must be very tired; you are pale.
**10** This price couldn't be right. It was too much for a camera.
**11** Something wrong must have happened to Anna. She is usually very punctual.
**12** I must have been out last evening. She did not answer the telephone.

**4.7 Put these phrases into the correct position on the scale of probability.**

**A** The price of food products will definitely rise.
**B** The price of food products may rise.
**C** The price of food products is unlikely to rise.
**D** I'm sure that the price of food products will rise.
**E** It's likely that the price of food products will rise.
**F** The price of food products might rise.
**G** I'm certain that t he price of food products won't rise.
**H** It's unlikely that the price of food products will rise.
**I** The price of food products should rise.
**J** I'm certain that the price of food products will rise.

| | | |
|---|---|---|
| **1 __A__**<br>**2 ____**<br>**3 ____** | | **100% certainty** |
| **4 ____**<br>**5 ____** | | **75% probability** |
| **6 ____**<br>**7 ____** | | **50% possibility** |
| **8 ____**<br>**9 ____** | | **25% improbability** |
| **10 ____** | | **0% impossibility** |

- **Request** **(*can/could-will/would/may/might*)**
- **Possibility** **(*can- could, may-might*)**
- **Permission** **(*can/could-may/might*)**

**4.8 Make requests for the following situations. You want someone to …**

**1** dial a number for you. *Will/would you dial a number for me, please?*
**2** hold the door open for you. _____
**3** translate a letter for you._____
**4** deliever some flowers for you. _____

**4.9 Use the proper modal verbs to ask for or give permission.**

**1** "_____ I use your mobile phone?" "Sure, you _____ – go ahead."
**2** " _____ I use your password?" "No, I'm afraid you can't."
**3** " _____ I come back later?" "No, I don't think that'll be possible."
**4** " _____ I sit here?"
**5** " _____ I borrow the car this weekend?"
**6** " _____ pass me that catalogue?"
**7** "You _____ check the exchange rate first."
**8** "She _____ switch on the air conditioning ."
**9** "You _____ give her a lift into town."
**10** "He _____ let me know if it really necessary."

**4.10 Make appropriate sentences from this tables using *can* to express possibility.**

| | | | | |
|---|---|---|---|---|
| Learning a foreign language | | | | hard work |
| Entertaining overseas customers | | occasionally | | good fun |
| Being in charge of a new project | | sometimes | | challenging |
| Setting up in business | can | often | be | a waste of time |
| Negotiating a contact | | | | painful |
| | | | | boring |

- **Advice** **(*should/ought//must*)**
- **Offer** **(*shall-can-could*)**
- **Suggestion** **(*shall-can-could*)**
- **Criticism** **(*should-ought*)**

**4.11 Fill in *shall* or *will.***

**1** **A:** ...*Shall*... I help you with the washing-up?
**B:** No, I can manage by myself.
**2** **A:** _____ we have pizza for dinner tonight?
**B:** I'd rather have steak
**3** **A:** _____ you carry this for me, please?
**B:** Certainly. It looks heavy.
**4** **A:** What _____ we buy for Bob's birthday?
**B:** I think he'd like a book.
**5** **A:** _____ you answer the phone, please?
**B:** Of course.
**6** **A:** Where _____ we sit in the classroom?

**B:** Next to the window.

**7** **A:** _____ you take the rubbish outside for me, please?

**B:** Yes, in a minute.

**8** **A:** _____ we have a barbecue next weekend?

**B:** Yes, if the weather's fine.

**9** **A:** _____ you babysit for me tonight?

**B:** I'm sorry, but I can't.

**10** **A:** _____ we try this new recipe tonight?

**B:** Yes. We've got all the ingredients

**4.12 Read the situations and complete the sentences with *should/shouldn't, ought to/ought not to* and the correct tense of the infinitive to criticize your own actions or someone else's.**

**1** Your friend didn't see a film on TV last night. You saw it and it was very good. You ...*should/ought to have seen...* (***see***) the film.

**2** Liz bought an expensive jacket yesterday and now she hasn't got enough money for the rest of the week. She _____ (***buy***) such an expensive jacket.

**3** Your sister eats a lot of junk food which is bad for her health. She _____ (***eat***) so much junk food.

**4** Mr Jackson had a stiff back. He lifted some heavy boxes and now his back is worse. He _____ (***lift***) those heavy boxes

**5** I always drive too fast. Yesterday, I was arrested for speeding. I _____ (***drive)*** more slowly.

**6** Sally is clumsy. She is always breaking things. She _____ (***be***) more careful.

**7** I didn't do my homework. The teacher punished me. I _____ (***do***) my homework.

**8** Ann borrowed her brother's car without asking. He was very angry. She _____ (***borrow***) his car without asking.

**4.13 Underline the correct word(s) in bold to express advice.**

**1** **A**: I found a briefcase on the train.

**B:** You ***can/should*** take it to the police station as soon as possible.

**2** **A:** Sorry I'm late again.

**B:** You ***should/might*** wear a watch.

**3** **A**: We ***should/must*** go out for a meal this evening at last!

**B:** Oh, yes. That would be nice.

**4** **A:** You ***could/must*** use your telephone to inform me immediately.

**B:** Yes, of course.

**5** **A**: You ***must/should*** go shopping this evening. We haven't got any of food.
**B:** All right. I'll do it just now.

**6** **A:** Helen will be here by now.
**B:** You ***ought to/can*** do your best to appeal her.

**4.14 Complete the dialogue with the expressions of offers and suggestions. Then reproduce the dialogue with the group mate.**

***Do you need any help*** ***Shell I hold the door open*** ***I'll give you***
***Would you like me*** ***We must get together***

**A:** It's bee wonderful seeing you (**1**) _____ some time.
**B:** Yes, that'd be very nice.
**A:** (**2**) _____ with your baggage?
**B:** No, thanks. I can manage.
**A:** Are you sure? (**3**) _____ for you?
**B:** Yes, please.
**A:** (**4**) _____ to call a taxi?
**B:** No, thanks. I'll walk. It's not far.
**A:** No, you can't possibly. Your cases are heavy (**5**) _____ a lift. It won't take me two minutes to get the car.
**B:** Well, thank you very much. It's really very kind of you.
**A:** Not at all. It's my pleasure.

# *ADDITIONAL TEXTS FOR READING*

## TEXT 1. WHAT IS GIS?

GIS is a method of digital (i.e., computerized) mapping that can show you where particular people, events, things, or conditions are, and give you other information about them as well. It links data to its geographic location.

We can look briefly at how GIS works by using the traffic example above. The planner started with a GIS computer program that creates maps from data that's fed into it. It displays "layers" of geographic information, usually starting with a map of the geographic area you're interested in – in this case, a street map of Petersonville. The locations of all accidents in the past six months, for instance, would be another layer; the locations of accidents that resulted in hospitalizations during that same period might be a second; the locations of traffic controls (warning or stop signs, flashing lights, etc.) could constitute a third.

Imagine that the street map is drawn on paper, and the other layers are drawn on transparent plastic to exactly the same scale. You could place one or more of the layers over the street map and immediately see where accidents happened, where they were clustered, where the serious accidents were most likely to occur, what effects traffic controls seem to have, etc. That's exactly what is done with GIS, but far more quickly and more accurately than a hand-drawn map would.

GIS can do the same with all kinds of information, as long as it has a geographic reference (i.e., as long as you can specify its location). In order to function, however, GIS systems have basic needs:

- Hardware with enough power to run the GIS software.
- GIS software with the capabilities you need.
- Accurate data, in a form that can be fed into the software program.
- People trained to use the GIS system.

## TEXT 2. FOUR REQUIREMENTS FOR USING GIS EFFECTIVELY.

### 1. Components of GIS: The appropriate hardware.

You need a computer with enough memory, video capacity, and hard disk storage space to run the GIS program you want to use. As we'll see when we discuss software, just how much computing capacity is necessary depends on what kind of software you choose, and on whether you make your own GIS maps or only need the capacity to view those that are created by someone else**.**

**2. Components of GIS: The appropriate software.**

GIS software ranges from simple viewers, which allow you to view, but not create, maps, to map-creation software that can display a small number of layers, to powerful applications that can handle and display enormous amounts of data. Some software can create and display GIS maps from a website, making them accessible to large numbers of users at a time. Other types of software can embed GIS capacity into non-GIS applications, so that non-GIS software programs can use the data stored in them to create GIS maps. The software you need depends on what you want to do with GIS, how much you intend to use it, and how important it is to the overall functioning of your organization or project.

**3. Components of GIS: The necessary data.**

GIS software can't create a map unless it has the information to do so. This comes from the data that the software has to use. There are two kinds of data necessary:

***Spatial data***. This is information that specifies features that actually exist or are imposed by people on the ground in the area you're interested in. These might include roads, rivers, political boundaries, towns, coastlines, etc. Spatial data can also locate objects – buildings, open spaces, forest, etc.

***Attribute data.*** These are data that give you information about the area you're interested in and the people and features that exist there. Some possible data here are who lives where (and how many of them per square mile or kilometer), where different kinds of businesses are concentrated, how land is used, aspects of the population (languages, race, the incidence of particular medical conditions, income, education, crime rates), trends and changes over time (tracing the conversion of farmland to housing developments over 10 or 20 years, for instance), transportation routes, recent development – anything that provides you with useful information.

**4. Components of GIS: People trained to use the system.**

Software, no matter how good, is only useful if it's used properly, and if all its abilities are taken advantage of. In order for that to happen, the people using it have to be familiar with all its possibilities, and have to know how to get the most out of it. Some simple GIS software may be easily learned from a manual by anyone who's reasonably comfortable with computers and maps. More complicated software may require something more – a tutorial program, help from others who've used it, or even a full-fledged training or a college or university course. Whatever software you choose, make sure that you have the necessary understanding to use it well.

Using the system includes not only using the software, but understanding what you're looking at and interpreting the patterns that appear on the maps you've created. The maps give you information, but you have to interpret that information in ways that lead to some better understanding or some action that will address that with which you're concerned. In the traffic example at the beginning of this section, for instance, the Town Planner analyzed the map information to decide where to put traffic controls.

## TEXT 3. WHY WOULD YOU USE GIS?

Clearly, the use of GIS requires some expense and preparation. Why would you go to the trouble? There are actually a number of good reasons. GIS is a powerful tool that can be used for analysis and assessment of the community or of an issue, and the planning, implementation, and evaluation of an intervention or initiative. Some of the advantages of using GIS:

1. It can help you determine how seriously an issue affects an area or the community as a whole. The layering of several factors on a map can give you a clearer picture of, or new insight into, the nature, extent, and distribution of a condition, and make it easier to compare it with other issues in the same area.

2. It can clarify the relationships among several factors, populations, or issues. Often, being able to see a picture of the interaction of various factors makes it much easier to understand how they influence one another. Relationships jump out at you from a map in a way that they don't from a column of numbers.

3. It can demonstrate how differently an issue affects different populations or geographical areas. This can be important information for a number of reasons. It can pinpoint problem areas or populations, give clues to the origin or cause of a condition, and suggest means of addressing the problem.

4. It can show you exactly where to concentrate your efforts. If you're concerned with AIDS prevention, for example, GIS can help to identify areas where the population is at the highest risk, and where outreach, clinics, needle exchange, or other preventive measures would do the most good.

5. It can help you better understand the area or community in which you're working. A GIS map can show a large amount of information all at once. It may, for instance, illustrate for a targeted neighborhood abandoned buildings, population density, and the age, income, ethnicity, and education level of the population. The ability to see

all these factors together can be a powerful tool for assessment and planning. It can also confirm or negate impressions or unsupported assumptions about an area, giving you a clearer and more objective view upon which to base conclusions.

6. It can allow you to isolate and examine individual aspects of the situation or area. By choosing layers to display, you can look at the interaction of various pairs of factors, or just look at the geographic spread of specific ones.

7. It can provide a picture of the community's or area's assets and weaknesses. Seeing these graphically can make clear just how many positive aspects there are to the community, and how much already exists that can be mobilized to address problems. At the same time, it shows where assets are lacking, and can suggest ways to deal with that.

8. It can help in designing, implementing, and evaluating interventions. GIS provides the evidence on which to base planning and implementation decisions, as well as a basis on which to justify those decisions to funders and policy makers.

9. It can show you change over time. Comparing two maps, one showing the incidence of a condition two years ago and the other current, can help you understand where and how your efforts are succeeding and where and how they're not. By the same token, by using GIS maps you can compare your work to that of others, and consult with others if they seem more successful.

10. GIS is by far the quickest and most efficient method of creating maps and similar graphics that provide a picture of not only the geographic, but of the social, demographic, environmental, political, and other aspects of an area as well. GIS systems can gather and present information graphically in a variety of ways, change it at command with just a few mouse clicks or keystrokes, reorganize it, and manipulate it, creating each time a graphic representation that clarifies conditions and relationships. If you need this kind of information (and not everyone does), GIS is the best way to produce it.

11. GIS maps make powerful presentation tools. For most people, visual representations are easier to grasp than columns of figures or oral presentations. GIS maps can provide simple, understandable explanations of sometimes complex situations and issues, and make strong arguments for courses of action.

12. Perhaps most important, GIS maps can help influence policy. Policy makers, particularly elected officials, often know relatively little about the issues their

decisions affect. Because they are so powerful at representing conditions in an area, GIS maps can help policy makers understand issues more clearly, and lead to policies that address reality in rational ways.

## TEXT 4. EVERYDAY, SPATIAL MAPPING

We all know what a map is. In its simplest form, it's a picture of a place, usually seen from above. A map can picture an area as small as a tiny printed circuit, or as large as the solar system, but most of the maps we use in our daily lives cover a country or a state or a town.

These maps give us spatial information: they tell us where things are. They include such physical features – actual places you can experience in reality – as towns and cities, main roads, and bodies of water. If the map is more complex, it may also locate mountain ranges and peaks, railroads, elevations (height above sea level, indicated either by shading or by contour lines), or other elements of the landscape.

Our maps also include political features – imaginary lines imposed on the landscape by people. These include the boundaries of towns, states, countries, national and state parks, historic districts, watershed areas, conservation land, and other areas that are political units or that have been set aside by government or others for a particular purpose.

Finally, the maps we use every day include the names of important physical and political features. The names, like political boundaries, are artificial and invisible, but they are tremendously important in making a map useful. They locate us in our world, and tell us where we are in relation to other places whose names we know.

## TEXT 5. 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.

## APPENDIX 1

### Pronunciation

**Pronunciation of *–(e)s* ending** (noun plurals and the 3 d person singular of verbs in the Present Simple)

| | | |
|---|---|---|
| **/S/** | after **/f/, /t/, /p/, /k/** | laughs, spots, drips, racks |
| **/IZ/** | after **/z/, /d□/, /t□/ , /s/, /□/** | houses, dodges, ditches, passes, lashes |
| **/Z/** | after **/b/, /p/, /m/, /d/, /l/, /n/, /v/** | dabs, rigs, beams, thrills, pains, leaves, toys |

**Pronunciation of *–ed* ending**

| | | |
|---|---|---|
| **/id/** | after **/t/, /d/** | lifted, branded |
| **/t/** | after **/k/, /t□/, /f/, /s/, /□/, /p/** | baked, matched, laughed, lanced, dashed, trapped |
| **/d/** | after **/b/, /d□/, /m/, /v/, /g/, /l/, /n/, /z/, vowel +/r/** | snubbed, nudged, dimmed, craved, drugged, spilled, opened, cruised, cared |

## APPENDIX 2

### Word Formation

- **Prefixes** are syllables which we add before certain words to form new words. The meaning of the new words depend on the prefix that has been used.

| | | |
|---|---|---|
| **anti-** | = | ***against*** (anticlockwise) |
| **bi-** | = | ***two*** (bilingual) |
| **co-** | = | ***with*** (co-educational) |
| **counter-** | = | ***in the opposite direction*** (counterattack) |
| **ex-** | = | ***previous, former*** (ex-president) |
| **inter-** | = | ***between*** (interstate) |
| **mis-** | = | ***done wrongly or badly*** (misread) |
| **mono-** | = | ***one*** (monolithic) |
| **multi-** | = | ***many*** (multicultural) |
| **non-** | = | ***not*** (nonexistent) |
| **out-** | = | ***more, better*** (outlast) |
| **over-** | = | ***(done) to a great extent*** (overdo) |
| **post-** | = | ***after*** (postwar) |
| **pre-** | = | ***before*** (prenuptial) |

**pro-** = ***in favour of*** (pro-American)
**re-** = ***again*** (redesign)
**semi-** = ***half*** (semi-circle)
**sub-** = ***under, less*** (subordinate)
**super-** = ***big, more*** (superior)
**trans-** = ***from one side, group etc to another*** (transatlantic)
**tri-** = ***three*** (triathlon)
**under-** = ***not enough*** (underdeveloped)
**uni-** = ***one*** (uniform)

The prefixes below are used to express opposite meanings.

**de-** destabilize, dethrone
**dis-** disadvantage, disbelief
**in-** insufficient **BUT**
**il-** (***before*** **l**) illegal
**im- (*before* b, m, p)** immature, improbable
**ir-** (***before*** **r**) irregular **BUT** unreal, unremarkable
**non-** non-dairy
**un-** unattractive, uncivilized

Some prefixes are added to words to form verbs.

**en–** courage – encourage
**BUT em-** ***before*** **b, m, p**) body – embody

- **Suffixes** are syllables which we add to the end of certain words to form new words.
  - **Nouns referring to people**
    - **verb + *-er/-or/-ar (***work – worker, act – actor, burgle – burglar)
    - **noun/verb/adjective + *-ist*** (social – socialist, piano – pianist, natural – naturalist)
    - **verb + *-ant/-ent*** **(**assist – assistant, reside – resident)
    - **noun + *-an/-ian*** (republic – republican, Italy – Italian)
    - **verb + *-ee (passive meaning)*** (employ – employee)
  - **Nouns formed from verbs**
    **-age** post – postage
    **-al** propose – proposal
    **-ance** perform – performance
    **-ation** animate – animation
    **-ence** coincide – coincidence

**-ion** televise – television
**-ment** employ – employment
pretend – pretension ***(verbs ending in –d/-t)***
**-sis** hypothesise – hypothesis
**-tion** describe – description
**-ure** close – closure
**-y** discover – discovery

– **Nouns formed from adjectives**
**-ance** relevant – relevance
**-cy** urgent – urgency
**-ence** patient – patience
**-ion** isolated – isolation
**-iness** happy – happiness
**-ness** sad –sadness
**-ity** relative – relativity
**-ty** royal – royalty
**-y** honest – honesty

– **Adjectives formed from nouns**
**-ous** nausea –nauseous
**-al** nation – national
**-ic** history – hystoric
**-ical** theatre – theatrical
**-ish** girl – girlish
**-ive** suppression – suppressive
**-ful** (with) dread – dreadful
**-less** (without) name – nameless
**-ant** brilliance – brilliant
**-able** reason – reasonable
**-y** wealth – wealthy
**-ly** world – worldy

– **Adjectives formed from verbs**
**-able** treat – treatable (verbs ending in **–d/-t**)
**-ible** sense – sensible
**-ive** exclude – exclusive
**-ate** consider- considerate
**-ent** differ – different

– **Verbs formed from adjectives**
**-en** bright – brighten
**-ise** real- realize

– **Verbs formed from nouns**
**-en** strtenth – strenthen

## APPENDIX 3

### Irregular Verbs

There are about 180 irregular verbs. Some are very unusual. Here are the most useful.

| First form | Second form | Third form | First form | Second form | Third form |
|---|---|---|---|---|---|
| ***All forms the same*** | | | ***Second and third forms the same*** | | |
| cost | cost | cost | bend | bent | bent |
| cu | cut | cut | build | built | built |
| hit | hit | hit | feel | felt | felt |
| hurt | hurt | hurt | keep | kept | kept |
| let | let | let | leave | left | left |
| put | put | put | light | lit | lit (lighted) |
| set | set | set | lend | lent | lent |
| shut | shut | shut | mean | meant | meant |
| split | split | split | meet | met | met |
| ***Similar sound group*** | | | send | sent | sent |
| beat | beat | beaten | shoot | shot | shot |
| bit | bit | bitten | sleep | slept | slept |
| eat | ate | eaten | spend | spent | spent |
| fall | fell | fallen | spoil | spoilt | spoilt |
| forget | forgot | forgotten | get | got | got |
| forgive | forgave | forgiven | lose | lost | lost |
| give | gave | given | sat | sat | sat |
| hide | hid | hidden | | | |
| shake | shook | shaken | bring | brought | brought |
| take | took | taken | buy | bought | bought |
| tear | tore | torn | fight | fought | fought |
| wear | wore | worn | think | thought | thought |
| | | | catch | caught | caught |
| blow | blew | blown | teach | taught | taught |
| flow | flew | flown | | | |
| know | knew | known | feed | fed | fed |
| throw | threw | thrown | find | found | found |
| grow | grew | grown | have | had | had |
| draw | drew | drawn | hear | heard | heard |
| | | | hold | held | held |
| begin | began | begun | make | made | made |
| drink | drank | drunk | pay | paid | paid |
| ring | rang | rung | read | read | read |

| | | | | | |
|---|---|---|---|---|---|
| sing | sang | sung | say | said | said |
| shrink | shrank | shrunk | sell | sold | sold |
| | | | stand | stood | stood |
| freeze | froze | frozen | understand | understood | understood |
| speak | spoke | spoken | tell | told | told |
| steal | stole | stolen | stick | stuck | stuck |
| break | broke | broken | win | won | won |
| wake | woke | woken | shine | shone | shone |
| choose | chose | chosen | ***All forms different*** | | |
| drive | drove | driven | be | was/were | been |
| write | wrote | written | become | became | become |
| ride | rode | ridden | come | came | come |
| | | | do | did | done |
| | | | go | went | gone |
| | | | run | ran | run |
| | | | see | saw | seen |
| | | | show | shown | shown |
| | | | spill | spilled | spilt |

***Confusing Verbs***

| | | | | |
|---|---|---|---|---|
| lay | laid | laid | laying | - to put sth in a particular position |
| lie | lay | lain | laying | - to be or put yourself in a flat position |
| lie | lied | lied | lying | - to say sth that you know is not true |

## APPENDIX 4. Order of Adjectives

| **deter-miners** | **opinion adjectives** | **fact adjectives** | | | | | | |
|---|---|---|---|---|---|---|---|---|
| like ***a, my, some*** | like ***nice, lovely*** **etc.** | **size** | **age** | **shape** | **colour** | **origin** | **material** | **application** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |

## APPENDIX 5. Functions of Modal Verbs

**Expressing ability**

**a** Terry is twenty years old. He ***can*** drive a car. (*present*)

**b** When he was ten, he ***could/was able to*** ride a bicycle.(*past repeated action*)

**c** Paula ***was able*** to climb to the top of the mountain.
(*<u>managed to do</u>; past single action*)

**Expressing lack of ability**

- **a** Sue ***can't*** dance. (*present*)
- **b** He ***couldn't/wasn't able to*** play chess when he was younger. (*past repeated action*)
- **c** She ***couldn't/wasn't able to*** finish the book. (*past single action)*

**Expressing obligation/duty/necessity**

- **a** You ***must*** attend the meeting. (*You are obliged to/You have to/You need to/It is necessary.)*
- **b** I ***must*** attend the meeting. (*I have decided.)*
- **c** I ***have to*** attend the meeting. (*Someone else has decided*.)
- **d** We ***ought to/should*** respect the elderly. (*less strong than must*)
- **e** ***Need*** I ***buy*** her a present? (*Is it necessary?)*

**Expressing absence of necessity**

- **a** She ***does't need to/doesn't have to/needn't*** do the shopping. I'll do it later. (*It isn't necessary.)*
- **b** She ***didn't need to/didn't have to*** do the shopping as I had already done it. (*It wasn't necessary for her to do it.)*
- **c** She ***needn't have done*** the shopping. (*It wasn't necessary for her to do the shopping, but she did.)*

**Expressing prohibition**

You ***mustn't/can't*** be late for work. (*it's forbidden/you aren't allowed to /it's against the rules/law)*

**Expressing certainty**

- **a** He ***must*** be at home. (*positive; I'm sure he is.)*
- **b** He ***can't*** be sleeping. (*negative; I'm sure he isn't.*)

**Expressing probability**

He ***ought to/should*** be in now. (*He is probably in.)*

**Expressing possibility**

- **a** It ***can*** get very hot in July. *(it is theoretically possible*)
- **b** We ***could/may/might*** be a little late. (*it is possible)*
- **c** He ***could/might have been*** injured. (*but he wasn't*)

**Asking for permission**

- **a** ***Can*** I ask you a question, please? (*informal*)

**b** ***Could*** I ask you a question, please? (*more polite*)

**c** ***May/Might*** I ask you a question, please? (*formal*)

**Giving/Refusing permission**

a You ***can*** park your car here. (*informal*)

b You ***may*** park your car in this area. (*formal – usually written*)

c You ***can't/mustn't*** use this phone. (*informal*)

d You ***may not*** use this phone. (*formal – usually written*)

**Talking about permission**

**a** All students ***can/are allowed*** to use the library. (*regulation*)

**b** I ***could/was allowed*** to go out alone when I was 18. (*general permission*)

**c** I ***was allowed*** to go out out alone last night.
(*permission for one particular action*)

**Making requests**

**a** ***Can /Will*** you explain this to me? (*informal*)

**b** ***Could/Would*** you explain this to me? (*more polite*)

**c** ***Can*** I have some water? (*informal*)

**d** ***Could/May*** I have some water? *(formal*)

**e** ***Might*** I have some water? (*very formal*)

**Making offers**

**a** I'***ll*** help you with your essay. (*I'm willing to help you.)*

**b** ***Shall/Can/Could*** I carry this bag for you?
(*Would you like I me to/Do you want me to do it?)*

**Making suggestions**

**a** ***Shall*** we visit Grandma this weekend? (*Why don't we....?/How about....?'/What… about?)*
(*What is your suggestion?)*

**Giving advice**

**a** You ***ought to/should*** study harder. (*I advise you to.*)

**b** You ***must*** study harder. (*I strongly advise you to.)*

**Expressing criticism**

You ***ought to/should*** have been more careful. (*It would have been better if you had been more careful*.)

## VOCABULARY to the UNITS

| | | |
|---|---|---|
| ad hoc | – | специальный, подготовленный специально |
| affect (v) | | (воз)действовать, влиять, наносить ущерб |
| align with (*v*) | - | совмещать с ч -л |
| area | | пространство; зона; район |
| ASCII | _ | Американский стандартный код для обмена информацией |
| assemble (*v*) | – | собирать, компоновать; устанавливать |
| assign | – | присваивать, назначать (значения) |
| attribute | – | свойство, качественный или количественный признак, характеризующий пространственный объект, атрибут |
| available | – | имеющийся (в распоряжении); годный, применимый; действительный |
| border *(v)* | – | граничить |
| to browse | – | просматривать |
| browse | – | программа просмотра |
| capabilities | – | *зд.* характеристики |
| capture *(v)* | – | захватывать; собирать |
| chart *(v)* | | наносить на карту; составлять карту |
| chart *(n)* | – | – карта; таблица |
| cluster (*n*) | – | группа объектов с общими признаками |
| colour-code (*v*) | – | кодировать с помощью цвета векторизовать |
| compile *(v)* | – | компилировать, составлять |
| computer-aided | – | автоматизированный, с использованием ЭВМ |
| construct (*n*) | – | конструкция, структура |
| convert *(v)* | - | превращать, переделывать |
| coverage | – | охват; зона действия; сектор обзора |
| critical | – | опасный; основной; ответственный |
| curvature | | кривизна, изгиб, искривление |
| database management system (**DBMS**) | – | система управления базой данных |
| define (*v*) | – | определять; характеризовать; обозначать |
| digitize (*v*) | – | преобразовывать в цифровую форму |
| derive (*v*) | - | устанавливать происхождение |
| devise (*v*) | – | изобретать, разрабатывать |

| | | |
|---|---|---|
| digitizing software | – | программное обеспечение для ввода графической информации |
| directory | – | указатель, справочник, руководство |
| distort *(v)* | - | искажать |
| draft *(v)* | – | составлять план, чертить, рисовать |
| edit *(v)* | – | Редактировать |
| effect (*v*) | – | действовать, воздействовать, оказывать влияние |
| encoding numbers | – | цифры кодирования |
| to evolve (*v*) | – | развивать, разрабатывать |
| feature | – | пространственный объект |
| field data | – | -эксплуатационные данные |
| fine | – | точный |
| fold (*v*) | – | складывать, перегибать |
| force (*v*) | – | вынуждать, принуждать |
| handle (*v*) | _ | обрабатывать данные, оперировать данными |
| impact | – | влияние, воздействие |
| import (*v*) | – | вводить |
| involve (*v*) | – | включать в себя; подразумевать; предполагать |
| item (*n*) | – | элемент данных |
| landmark | – | ориентир (на местности), репер |
| layer | – | разрез (чертежа); слой, пласт |
| layout | – | размещение, компоновка; формат |
| list (*v*) | – | вносить в список, составлять список |
| locate (*v*) | – | определять (место)нахождение; располагать в определенном месте |
| location | – | место, (место)положение |
| mappy package | – | картографический пакет |
| match (*v*) | – | подгонять, подбирать - |
| match | – | соответствие, совпадение |
| measure (*v*) | – | измерять, оценивать, определять |
| mimic (*v*) | – | подражать, имитировать |
| native | – | родной , собственный |
| neighbourhood | – | округа, район |

| | | |
|---|---|---|
| numerical value | – | числовое значение |
| output | – | выходные данные, результаты |
| overlay (*v*) | – | накладывать, совмещать |
| package | – | *зд*. пакет программ |
| parcel | | участок (*земли*) |
| pattern | – | образец; пример; шаблон; схема; (общая) картина; система, структура |
| permeate (*v*) | – | проникать, распространяться |
| plot (*v*) | – | составлять план; наносить на план, чертить |
| plotter | – | графопостроитель |
| poligon | – | многоугольник; замкнутая линия (*двухмерный (площадной) объект; внутренняя область, образованная замкнутой последовательностью дуг)* |
| property | – | 1.свойство, качество; характеристика, параметр; 2. собственность |
| proprietary | – | патентованный |
| query (*v)* | – | делать запрос, давать задание на поиск информации |
| regard (*v)* | – | принимать во внимание |
| regular attribute | | обычный характерный признак |
| relate (*v)* | – | относиться, иметь отношение |
| remote (*v)* | - | удалять, устранять |
| render (*v)* | – | представлять; воспроитзводить, передавать, изображать |
| report generator | – | формирователь отчетов |
| retrieval | | поиск |
| scaled-down | – | уменьшенный в масштабе |
| to scribe | – | размечать |
| search engine | – | поисковый инструмент |
| seek (*v*) | - | искать, определять |
| sequential | – | являющийся продолженнием или следствием |
| skip (*v*) | – | пропускать |
| spatial | – | пространственный |
| spot light | – | прожектор |
| specific | | точный, определённый; конкретный;ограниченный |
| spot (*v*) | – | определять место, размечать |

| | | |
|---|---|---|
| spot | – | место, область, зона |
| structure (*v*) | – | составлять (карту) |
| subset | – | подмножество |
| tablet, digital tablet, digitizer | – | цифровой планшет (для графического ввода данных, дигитайзер, устройство для аналого-цифрового преобразования данных |
| tangible (*adj.)* | – | ощутимый; ясный, реальный |
| tedious | – | скучный, утомительный |
| tool | | метод, способ |
| toolbox | | *зд*. пакет вспомогательных программ |
| traffic lane | – | полоса дороги |
| trivial | – | обыденный, банальный; ненаучный |
| visual map | – | наглядная, визуальная карта |
| virtual | – | виртуальный, допускаемый, фактический, текущий |
| unwieldy | – | громоздкий, неуклюжий |
| utility programme | – | сервисная программа, утилита |
| winding line | – | извилистая линия |
| wire | – | провод |

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