МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА РОССИЙСКОЙ ФЕДЕРАЦИИ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ «ГОРСКИЙ ГОСУДАРСТВЕННЫЙ АГРАРНЫЙ УНИВЕРСИТЕТ»

Факультет Технологического менеджмента

Кафедра иностранных языков

УТВЕРЖДЕН
на заседании кафедры
«03» марта 2017 г., протокол № 7
Зав. кафедрой

Газзаева З.А..

ФОНД ОЦЕНОЧНЫХ СРЕДСТВ
по учебной дисциплине

Бизнес курс иностранного языка (английский язык)

Б1.В.ДВ.01.02

Направление подготовки
27.03.01 Стандартизация и метрология

Профиль подготовки
Стандартизация и сертификация

Квалификация выпускника
бакалавр

Владикавказ 2017

Фонд оценочных средств предназначен для контроля знаний студентов по дисциплине «Бизнес курс иностранного языка (английский язык)». Направление 27.03.01- Стандартизация и метрология. Профиль подготовки: Стандартизация и сертификация. Квалификация выпускника: Бакалавр

Составитель  Колиева У.Х.

«03» марта 2017 г.

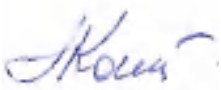
Фонд оценочных средств обсужден на заседании кафедры Иностранных языков

«03» марта 2017 г., протокол № 7

Зав. кафедрой  Газзаева З.А.

Согласовано:

Председатель методического

совета факультета  А.Н. Кантемирова

Декан факультета  Б.Г. Цугкиев

Паспорт фонда оценочных средств
по дисциплине Бизнес курс иностранного языка (английский язык)

№ п/п	Контролируемые разделы (темы) дисциплины*	Код контролируемой компетенции (или ее части)	Наименование оценочного средства
1	Стандартизация и метрология	ОК-5, ПК-18	Перевод технического текста по специальности
2	Научная метрология (правовая, производственная)	ОК-5, ПК-18	Перевод технического текста по специальности
3	Значимость измерений	ОК-5, ПК-18	Перевод технического текста по специальности
4	Отрасли метрологии	ОК-5, ПК-18	Перевод технического текста по специальности
5	Стандарт	ОК-5, ПК-18	Перевод технического текста по специальности
6	Современные стандарты	ОК-5, ПК-18	Перевод технического текста по специальности
7	История измерений	ОК-5, ПК-18	Перевод технического текста по специальности
8	Контрольная работа	ОК-5, ПК-18	Контрольная работа
9	Что такое метрология и стандартизация	ОК-5, ПК-18	Перевод технического текста по специальности
10	Единица измерений	ОК-5, ПК-18	Перевод технического текста по специальности
11	История стандартизации и метрологии	ОК-5, ПК-18	Перевод технического текста по специальности
12	ГОСТ в России	ОК-5, ПК-18	Перевод технического текста по специальности
13	История измерений	ОК-5, ПК-18	Перевод технического текста по специальности
14	Стандарт Ч 2	ОК-5, ПК-18	Перевод технического текста по специальности
15	Задачи метрологии	ОК-5, ПК-18	Перевод технического текста по специальности
16	Контрольная работа	ОК-5, ПК-18	Контрольная работа

МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА РОССИЙСКОЙ ФЕДЕРАЦИИ
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Факультет Технологического менеджмента
Кафедра иностранных языков

Вопросы для собеседования
по дисциплине «Бизнес курс иностранного языка (английский язык)»

Тема

1. Стандартизация и метрология
2. Научная метрология(правовая, производственная
3. Значимость измерений
4. Отрасли метрологии
5. Стандарт
6. Современные стандарты
7. История измерений
8. Что такое метрология и стандартизация
9. Единица измерений
10. История стандартизации и метрологии
11. ГОСТ в России
12. История измерений
13. Стандарт Ч 2
14. Задачи метрологии

Критерии оценки:

- «**зачтено**» выставляется студенту, если он проявил знания основного программного материала в объеме, необходимом для последующего обучения, допустил неточности в ответе, но обладает необходимыми знаниями и умениями для их устранения при корректировке со стороны преподавателя;
- «**не зачтено**» ставится студенту, у которого обнаружены существенные пробелы в знании основного материала, которые не позволяют ему продолжить обучение без дополнительной подготовки по данной теме дисциплины.

МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА РОССИЙСКОЙ ФЕДЕРАЦИИ
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Факультет Технологического менеджмента
Кафедра иностранных языков

Комплект заданий для контрольной работы

Контрольная работа №1

I. Change the nouns given below into adjectives and translate them into Russian:

1. sun
2. wind
3. rain
4. snow
5. cloud
6. fog

II. Mark sentences which are true with "T' and "F" if a sentence is false:

1. It often pours with rain in desert.
2. Thunder makes a noise.
3. Lightning can kill people.
4. If it is humid, the air will be dry.
5. Below zero, water turns to ice.
6. When it is foggy, you need sunglasses.

III. Use the following prepositions in sentences below;
"in", "at", "by", "on"

1. He went to his work…car.
2. They went…a journey last month.
3. She arrived…Rome at midnight.
4. We arrived…the hotel early…the morning.
5. Do you like travelling…plane or…train.

IV. Give the meaning of the idioms in the sentences below and translate them into Russian:

1. I am going to get up early in the morning come **rain or shine.**
2. I am certainly not going o spend all my money, I am going to save some **for a rainy day.**
3. I don't think you should worry about incident too much. It is just **a storm in a teacup.**
4. We are having a lot of problems at the moment, but we **shall weather the storm if we stay together.**

V. Translate the following sentences into Russian, paying attention to the use of Passive Voice:

1. A lot of food products that we buy today are pre-cooked or frozen.
2. What will happen if more of the Amazon forest is cut down?
3. The London Zoo was established in 1828 by the Zoological Society of London.
4. Naturalists think that apes can be taught to communicate with the help of sign language.
5. Many kinds of exotic animals can be found in Australia today.
6. Her new book will be translated into a number of foreign languages.
7. A new meeting of supporters of the Green movement is going to be held next month.

VI. Use "something", "anything", "nothing", "somebody", "anybody", "nobody":

1. I want to tell you…interesting.
2. It's so dark in the room, I can't see….
3. When I opened the box, I saw that it was empty. There was…inside.
4. We had…to eat the whole day, so I'am hungry.
5. Look! The house is very quite. I think…lives there.
6. They need…to help them on the farm because they have a lot of animals there.
7. If…rings me up, please tell me.
8. The excursion was very dull, we didn't see…interesting.
9. Do you know…in this village?
10. There is…in the fridge. Go and buy…for dinner.

Контрольная работа №2

I. Use the words from the box in the sentences below:

Pollute, protect, save, damage

1. Industrial development is causing widespread…to the environment.
2. Plants and power stations…the air in the surrounding area.
3. The aim of this organization is to…animals from cruel treatment.
4. The aim of all the environmentalists is to…our planet from dying.

II. Use the verbs from the box in the right form and translate them into Russian:

Found, discover, provide, classify, suggest

1. From earliest childhood we are taught to give names to the objects around us and to…them in some simple way.
2. The laboratory was to…the necessary equipment for the experiment.
3. The expedition returned from the Alps where they…some new plants.
4. This young scientist is widely known now, not long ago he…a new method of breeding.
5. This society for protecting animals' rights was…a few years ago.

III. Complete the sentences below with the words from the box. Translate them into Russian:

DNA, nucleus, cell, chromosomes, gene, genome

1. A pattern of chemicals within a cell that carries information about the qualities passed on to a living thing from its parents is called a….
2. …is a complete set of genes in a living thing.
3. A…the command center of the cell, contains all the vital information needed by the cell or the whole organism to function.
4. Genetic engineering is used to take segment of…from one species and put them into another one.
5. When a…multiplies it will also copy all the DNA.
6. …look like bundled up knots and loops of a long thin thread.

IV. What is the odd word out?

a) name, cell, classify, found
b) organ, part, place, segment
c) botanist, surgeon, biologist, naturalist
d) artificial, synthetic, genuine, false
e) combine, separate, mix, blend

f) water, oil, gas, coal
g) nutrition, diet, feeding, breeding

V. Use "must" or "have to", sometimes it is possible to use either:

1. You really…to work harder if you want to pass the examination.
2. Many children in Britain…wear uniform when they go to school.
3. Last night our dog suddenly got ill. We…call the vet.
4. Ann…wear glasses since she was 8 years old.
5. I'm afraid, I can't come tomorrow. I…work late.
6. We couldn't treat our pet ourselves. We…take it to the vet.
7. When you come to London again, you…come and see us.

VI. Use the right pronoun:

1. …friend and I work together. …enjoy playing tennis.
2. They are from Canada and all…relatives still live there.
3. I like to spend…weekends with…family.
4. Ann and…mother are both teachers.
5. Michael is French and…wife is German.
6. …sister and I are American, but…grandparents are Greek.
7. Henry's mother is a nurse, …name is Lucy.
8. Alice and Bill are doctors and…son is a medical student.

VII. Use can/can't or could/couldn't:

1. People…talk but animals….
2. A dolphin…live out of water.
3. He can't play tennis very well now but he…quite well when he was younger.
4. You…see the sea from our bedroom window.
5. Ten years ago he…swim from one side of the lake to the other without stopping.
6. I looked everywhere for my pet but I…find it.
7. I'm afraid I…come to your party on Sunday. I'll have to help my grandfather in the garden.
8. He didn't feel well, so he…go on an excursion with us.

Критерии оценки:

- оценка «отлично» выставляется студенту, если в работе выполнены все задания без орфографических и грамматических ошибок;

- оценка «хорошо» выставляется студенту, если в работе выполнены все задания, отсутствуют грамматические ошибки, но допущены орфографические; или отсутствуют орфографические ошибки, но допущены 1-2 грамматические ошибки;

- оценка «удовлетворительно» выставляется студенту, если в работе выполнены все задания, но допущены незначительные орфографические и 3-5 грамматические ошибки;

- оценка «неудовлетворительно» выставляется студенту, если в работе не выполнены 50% всех задания, или работа выполнена с грубыми грамматическими ошибками

МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА РОССИЙСКОЙ ФЕДЕРАЦИИ ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ «ГОРСКИЙ ГОСУДАРСТВЕННЫЙ АГРАРНЫЙ УНИВЕРСИТЕТ»

Дисциплина Бизнес курс иностранного языка (английский язык)

Тексты для самостоятельного изучения

Alfred Nobel — a man of contrasts

Alfred Nobel, the great Swedish inventor and industrialist, was a man of many contrasts. He was the son of a bankrupt, but became a millionaire, a scientist who cared for literature, an industrialist who managed to remain an idealist. He made a fortune but lived a simple life, and although cheerful in company he was often sad when remained alone. A lover of mankind, he never had a wife or family to love him; a patriotic son of his native land, he died alone in a foreign country. He invented a new explosive, dynamite, to improve the peacetime industries of mining and road building, but saw it used as a weapon of war to kill and injure people. During his useful life he often felt he was useless. World-famous for his works, he was never personally well-known, for while he lived he avoided publicity. He never expected any reward for what he had done. He once said that he did not see that he had deserved any fame and that he had no taste for it. However, since his death, his name has brought fame and glory to others.

He was born in Stockholm on October 21, 1833 but moved to Russia with his parents in 1842, where his father, Emmanuel, made a strong position for himself in the engineering industry. Emmanuel Nobel invented the landmine and got plenty of money for it from government orders during the Crimean War, but then, quite suddenly went bankrupt. Most of the family went back to Sweden in 1859. Four years later Alfred returned there too, beginning his own study of explosives in his father's laboratory. It so occurred that he had never been to school or University but had studied privately and by the time he was twenty was a skilful chemist and excellent linguist having mastered Swedish, Russian, German, French and English. Like his father, Alfred Nobel was imaginative and inventive, but he had better luck in business and showed more financial sense. He was quick to see industrial openings for his scientific inventions and built up over 80 companies in 20 different countries. Indeed his greatness lay in his outstanding ability to combine the qualities of an original scientist with those of a forward-looking industrialist.

But Nobel was never really concerned about making money or even making scientific discoveries. Seldom happy, he was always searching for a meaning to life, and from his youth bad taken a serious interest in literature and philosophy. Probably because he could not find ordinary human love - he never married - he began to care deeply about the whole mankind. He took every, opportunity to help the poor: he used to say that he would rather take care of the stomachs of the living man the glory of the dead in the form of stone memorials. His greatest wish, however, was to see an end to wars, and thus peace between nations; and he spent much time and money working for the cause until his death in Italy in 1896. His famous will, in which he left money to provide prizes for outstanding work in physics, chemistry, physiology, medicine, economics, literature and promotion of world peace is a memorial to his interests and ideals. And so the man who often believed that he was useless and had done little to justify his life is remembered and respected long after his death. Nobel's ideals which he

expressed long before the threat of nuclear war have become the ideals of all progressive people of the world.

According to Nobel's will the capital was to be safely invested to form л fund. The interest on this fund is to be distributed annually in the form of prizes to those who, during the previous year did work of the greatest use to mankind within the field of physics, chemistry, physiology or medicine, economics, literature and to the person who has done the most lot brotherhood between nations, for the abolition or reduction of permanent armies and for the organization and encouragement of peace conferences.

In his will Nobel wrote that it was his firm wish that in choosing the pi i/c winner no consideration should be given to the nationality of the candidates, but that the most worthy should receive the prize, whether he i .i Scandinavian or not. This will was written in Paris, on November 27,

1895.

Since Nobel's death many outstanding scientists, writers and public I inures from different countries have become Nobel Prize winners.

Statue of Liberty

The Statue of Liberty National Monument officially celebrated he 100th birthday on October 28, 1986. The people of France gave the Statue to the people of the United States one hundred and seventeen years ago in recognition of the friendship established during the American Revolution.

Over the years, the Statue of Liberty has grown to include freedom and democracy as well as this international friendship. The sculptor Frederic Auguste Bartholdi was commissioned to design a sculpture to commemorate the centennial of the American Declaration d Independence.

The Statue was a joint effort between America and France and it was agreed upon that the American people were to build the pedestal, and the French people were responsible for the Statue and its assembly in the United States. However, lack of funds was a problem on both sides of the Atlantic Ocean. In France, public fees, various forms of entertainment and a lottery were among the methods used to raise funds. In the United States, benefit theatrical events, exhibitions, auctions assisted in providing needed funds. Meanwhile in France, Bartholdi required the assistance of an engineer to design such a colossal copper sculpture. Alexander Gustav Eiffel (designer of the Eiffel Tower) was commissioned to design the massive iron pylon and secondary skeletal framework. Back in America, fund raising for the pedestal was going particularly slowly, so Joseph Pulitzer (noted for the Pulitzer Prize) opened up the editorial pages of hi newspaper, «The World» to support the fund raising effort. Pulitzer use his newspaper to criticize both the rich who had failed to finance the creation of pedestal construction and the middle class who were content to rely upon the wealthy to provide the funds. Pulitzer's campaign of harsh criticism was successful. They got the money. The Statue was placed upon a granite pedestal inside the courtyard of the star-shaped walls of Fort Wood (which had been completed for the War of 1812.) The United States had responsibility for the operation of the Statue of Liberty. After 1901, the care and operation of the Statue was placed under the War Department. A Presidential Proclamation declared Fort Wood (and the Statue of Liberty within it) a National Monument on October 15th, 1924. In 1933, the care and administration works of the National Monument were transferred to the National Park Service. On September 7, 1937 jurisdiction of this Service was enlarged to encompass all of Bedloe’s Island and in 1956, the island's name was changed to Liberty Island.

Sports in Great Britain

The British have always been a nation of sport lovers and interest in all types of sport is as great today as it has ever been. Many sports which nowadays are played all over the world grew up to their present-day form in Britain. Football is perhaps the best example, but among the others are horse-racing, golf, lawn tennis and rowing.

Many people, both foreigners and British, consider cricket to be the most typically English of sports. It is true that cricket, unlike football, has until recently remained a specifically British game, played only in Britain, in some parts of the British Commonwealth and in Denmark. But it would be wrong to say that cricket is the most popular British sport: that is, undoubtedly, football. Nevertheless, it remains true that for most Englishmen the sight of white-flannelled cricketers on the smooth green turf of a cricket pitch represents something that is traditionally English.

Cricket and football, however, are merely the two most popular sports in Britain: there are many others. In the summer, lawn tennis probably comes next in importance to cricket. There are clubs in every town and in all the parks there are public courts where tennis may be played for an hour on payment of about one pound. Swimming is very popular and there are many public swimming baths. Rowing and canoeing are practiced less because there are not so many facilities. The annual Boat Race between Oxford and Cambridge universities on the river Thames is, however, one of the most popular sporting events of the year. Golf is becoming increasingly popular and many clubs have to turn prospective members away. Athletics is growing all the time.

The most popular winter sport, after football (or «soccer» as it is colloquially I called) is rugby football (or «rugger») which remains a largely amateur game. Winter sports such as skiing are generally impossible in Britain (except in Scotland) owing to the unsuitable climate, but more and more people spend winter holidays on the Continent in order to take part in them.

One reason for the great interest in sport in Britain is the Englishman's fondness for a little «flutter» (a slang expression for a bet or gamble) Gambling has always been an integral part of such sports as horse-racing and dog-racing and, in recent times, doing the «football pools» has become a national pastime. But whether as gambler, spectator or player, most Englishmen have some interest in at least some sports.

From the history of the Olympic Games

"We will take part in Olympic Games
In fair competition for the honour of
Our country and for glory of sport".

Long ago ancient Greeks often waged wars. Small states suffered and lost much even if they did not take any side in the war. The ruler of such a small state, Elis, wanted to live in peace with all neighbours. He was a good diplomat because his negotiations were successful and Elis was recognized a neutral state. To celebrate this achievement, he organized athletic games.

In the beginning this feast lasted one day, but later a whole month was devoted to it. All wars and feuds were stopped by special heralds who rode in all directions of Greece.

The games were held every four years in Olympia on the territory of Elis. The first games which later were called the Olympic Games were held about a thousand years before our era.

Usually the Olympic Games began before the middle of the summer. Best athletes arrived from many Greek states to Olympia to compete in running, long jumps, throwing of discus and javelin and wrestling. In the course of time first boxing and chariot races were also included in the Games. All athletes took an oath to compete honestly and keep the rules of the sacred Olympics. The athletes took part in all kinds of competitions. Winners were called «olympionics», they were awarded olive wreaths and cups of olive oil. This tradition has survived. In our time sportsmen often get cups and wreaths for

the first place in sports competitions.

Only men could take part in the Olympic Games. Women were not allowed even to watch the competitions at the stadium under the fear of death penalty.

The Olympic Games had been held for about eleven hundred years, until the emperor Theodosius banned them for religious reasons in 394 A. D.

The revival of the Olympic Games began in 1892, when a young French teacher Pierre de Coubertin made a speech before the Union of French sports clubs in Paris. Pierre de Coubertin understood the importance of sports which unified peoples of the world and was the cause of peace in ancient time.

On the 23rd of June 1894 the International Congress of the amateur sportsmen made an important decision: to revive the Olympic Games and to establish the International Olympic Committee which would be responsible for the administration of the modern Olympic Games. The first Committee consisted of 12 members. Now 82 members of the International Olympic Committee control the affairs of all member countries joined the Olympic movement.

THE ENVIRONMENT

Within a biological context, the term "environment" is used to mean the sum total of external factors to which a living system is exposed, including both the biotic (living) and the abiotic (non-living) influences. In thinking about an ecological environment we have to consider the physical features, the chemical characteristics and any biological interactions.

Thus, in taking stock of an environment from the physical standpoint, we have to consider the topography, the basic medium of which it is made (for example salt water, freshwater, soil type) and also the latitude, altitude and aspect relative to the sun. From the chemical standpoint we have to consider the available elements and the systems which ensure their continued availability. These systems are the biogeochemical cycles of raw materials, particularly water, carbon, nitrogen, sulphur and phosphorus. Thirdly, we have to consider the biological interactions, that is the effects that organisms have on each other and how animals and plants influence the survival of their own and other species. Lastly, the flow of energy into, through and out of the area has to be taken into account and this involves physical, chemical and biological aspects.

Consideration of these features does not, however, answer all ecological questions. Environments are not static but change over time. Organisms, by their activities, bring about changes in both the biotic and abiotic aspects of the environment. In this context, man is probably the most important organism, as his activities cause both rapid and radical changes. Another major problem is that of delimiting an environment. Where does a particular environment start and stop? Even in apparently straightforward situations, the demarcation of boundaries is complex. A pond seems to be a well-defined environment and the field surrounding it to be another, but between the two there is a region where the conditions are not the same as in the field or in the pond. Does this area constitute a different environment or in fact several environments grading into one another? This question is very difficult to answer and in most cases an environment cannot be accurately delimited.

The total number of environments on this planet constitute the *ecosphere.* Within the ecosphere there are thousands of *ecosystems.* Ecosystems occupy *habitats* and consist of *communities* of organisms which in turn are made up of *populations* of individual *species* which occupy particular *niches.* Each of these terms constitutes an important ecological concept.

CARL LINNAEUS AND HIS CLASSIFICATION OF THE NATURAL WORLD

Carl Linnaeus was the 18^{th} century Swedish scientist who revolutionised the system of classification of plants and who provided the basis for our modern method of scientific nomenclature.

In 1735 Carl Linnaeus published the first edition of his *Systerna naturae* or compendium and classification of the natural world and in it he included his "sexual system" for the classification of plants, by which the flowering plants were divided into classes and orders according to the number of the male organs (stamens) and the female organs (pistils); the Cryptogamia were considered plants

without flowers. The scheme was illustrated by perhaps the greatest of the early 18th century botanical artists, George Dionysius Ehret, a German who later settled in England. Ehret championed the Linnaean method of classification in England, sometimes against strong opposition, but over the next 80 years it gradually became the most widely used system in botanical works, until superseded by the work of the great 19th century botanists.

Carl Linnaeus was the founder of our modern method of giving plants and animals a binomial or two-word scientific name, the first word signifying the genus and the second word distinguishing the species. Since no species of animal or plant should have two or more different names, the correct name is as a rule taken to be the name that was first proposed. For convenience, the works of Linnaeus are the inter nationally agreed base-line for this. For zoology, the base line is the tenth edition of Linnaeus's *Systema naturae* of 1758. It was the enlarged twelfth edition of the *Systema* that was taken by the naturalists on Captain Cook's voyages, enabling them to find the approximate place in the system for the many new species they discovered. The starting point for botanical nomenclature is Linnaeus's *Species plant arum*, published in 1753, although there are some more recent baselines for fossil plants, fungi, mosses, and a few other groups.

In biological classification the main unit is the species. Related species are then grouped together into genera, the genera into families, the families into orders, the orders into classes, the classes into phyla, and the phyla into kingdoms. This hierarchy of groups makes the handling of more than a million species easier when information has to be summarized and it is also a means of expressing the relationships of organisms.

THE ECOSPHERE

The ecosphere has been defined by Boughey as that portion of the earth which includes the biosphere and all the ecological factors which operate on the living organisms it contains.

THE BIOSPHERE

The biosphere is the total living material on the Earth, which is limited in total quantity but is capable of infinite internal variety. Also, it is in a state of dynamic equilibrium with the abiotic factors and this totality of the living matter and the physical world in which it exists forms the ecosphere. The ecosphere is not a constant either at any one time or over a period of time. The study of change in the ecosphere over time is the realm of *evolution* while consideration of variations at a given time leads naturally to the examination of the constituent parts of the ecosphere, that is of the *ecosystems*.

ECOSYSTEMS

The term "ecosystem" was first used by Sir Arthur Tansley, Professor of Botany at Oxford University, in 1935 and is formed from the words "ecology" and "system". "Ecology", as other similar words such as "economy", comes from the Greek root "*oikos"* meaning a household and is defined in a dictionary as "that branch of biology which deals with organisms' relationships to one another and to their surroundings". The word "system" means an orderly working totality or a complex whole. Thus, an ecosystem is a complex, self- perpetuating assembly of organisms taken together with their inorganic environment. As Tansley pointed out, the organisms react with each other and with the various elements of the physical environment. All the constituents, both bio tic and abiotic, influence each other and if any one organism is removed or the quantity or quality of any physical element is changed then the whole ecosystem is altered.

An ecosystem is defined as an area where inputs and outputs can be measured across its boundaries but beyond this the delineation becomes vague. A beech tree with its associated animal and plant life on the bark, in the canopy and in the rhizosphere around the roots could be considered to be an ecosystem, but as the canopies and rhizospheres of trees tend to overlap it would be difficult to define boundaries. A whole beechwood could also be considered as one ecosystem, but again there may be difficulties in defining boundaries where it merges into other areas of vegetation. Usually, therefore, the term ecosystem is used for a clearly defined area with a distinctive flora and fauna, even

if this overlaps with other ecosystems at its edges. Thus, for example, a beechwood, a saltmarsh, a pond, a river and a hedgerow may all be defined as separate ecosystems.

Man is an important part of the biosphere, a fact which he tends to forget. Man's influence now is enormous and unfortunately it is often detrimental, largely as a result of his greatly increased population and materialistic way of life. As a result of man's activities, both organic and inorganic materials are removed from ecosystems and natural recycling is prevented.

As well as removing substances from ecosystems, man also adds to them. He adds large quantities of nutrients in the form of fertilizers and rich organic wastes such as sewage or effluent from factories processing organic materials. He may also add substances which would not occur naturally and which are in many ways detrimental. This is particularly so in the case of heavy metals from industrial processes and certain organic compounds which are used as pesticides or which are wastes from "civilised" human activities. Many of these compounds, such as polythene, are *biostable.* That is to say they are not easily broken down by bacteria. Apple cores and orange peel on the other hand, which rot away easily, are termed *biodegradable.*

Ecosystems are dynamic, not static, entities and as such are subject to change. Some of these changes are of a seasonal or cyclic nature whilst others are evolutionary and non-recurring. They may be due to man's activities but many, including both the devastating effects of fire, flood or earthquake and the gentler seasonal changes, are not caused by human influence.

HABITATS

Habitats are the geographical areas which are occupied by ecosystems. A habitat is a physical entity and it comprises the sum total of the abiotic factors to which a species or a group of species is exposed. The totality of a pond, the abiotic plus the biotic factors, forms an ecosystem. The abiotic part, i. e. the substratum and the water it contains, form the habitat for that ecosystem.

Some animals and plants are very specific as to their habitat, for example, calcicolous plants such as the grass dog's tail (*Cynasurus cristatus)* will only grow on soils containing calcium salts whilst Rhodadendron species will not grow on such soils. Some freshwater animals such as mayfly nymphs will only live in water with high oxygen content whilst others such as Chironomus larvae survive well in water almost devoid of oxygen. On the other hand, some species are very tolerant and will live in a wide variety of habitats. For example, perennial ryegrass or couch will grow in most temperature soils and earthworms will survive in almost any soil where they can form burrows. Although most species have evolved to live in specific habitats, some animals are extremely adoptable and can very quickly learn to live successfully in new habitats. Examples of these are rats which have adapted to live in sewers, langurs occupying ruined Indian temples or human fleas living in clothes.

The term "habitat" is usually used to mean a relatively large and well-defined area such as a garden seashore or meadow. However, such an area is not constant in its physical features and so may be sub-divided into parts which differ in their properties; these smaller areas with different characteristics form the general broad features of the whole habitat are known as *microhabitats.* Thus in a pond, for example, the water surface, the mud on the bottom, the spaces in a mat of blanketweed and those between the overlapping leaf bases of yellow flag are all different microhabitats within the pond habitat.

COMMUNITIES

A community is the total number of plant and animal populations living in a habitat. Certain sets of species tend to occur together, usually with one or a few species being dominant. Thus we can sometimes name communities after the dominant species present, for example, a *Salicorrtia* marsh community or a beechwood community.

Within a community, restraints are imposed on one member population by another and also by the habitat itself, so that no one population, not even that of the dominant species, displaces all the others. Communities pass through a life cycle, coming into existence when pioneer species occupy a barren area such as a mud flat or a sand dune. These species modify the environment so that other species can invade and survive, thus one species is succeeded by another until final colonization by the dominant

species occurs, which replaces itself rather than by being replaced by other species. This is the climax community. Generally speaking, the older and more mature the community, the more diverse will be the population of both plants and animals.

NICHES

A community consists of a number of populations within a given habitat. Each species population occupies a certain very specific part of the habitat and within this it performs certain functions. The habitat plus the function forms the niche of the species. The concept of a niche thus includes factors such as tolerance ranges from abiotic variables, the food relations of the species and also its predators. Every population has an ecological niche but no two species can occupy the same niche within a given community on a permanent basis. If two species have identical niches they will be in direct competition and one will eliminate the other; for different species to survive in one community there must be some differences in their niches. This has been shown many times with many different organisms. The classic experiment was performed by G. F. Gause in 1934 with species of *Paramecium.* When *P. caudatum* and *P. aurelia* were cultured together, the former was eliminated. This was because the two species occupied the same niche but *P. aurelia* bred faster and so became dominant. When *P. caudatum* and *P. bursaria* were cultured together, both survived, because although they used the same food resource they had different space requirements and thus were not occupying the same niche. Although the idea was not original and Gause did not wish to take credit for it, the concept that two species with an identical ecological niche cannot occupy the same environment became known as "Gause's principle".

There are many instances of related species evolving to occupy different niches and thus all surviving in a limited habitat. An example of this is the honeycreepers (family Drepaniidae) in Hawaii. A small population was introduced into the islands by chance and as there was no competition they exploited a variety of food sources, underwent adaptive radiation and now have evolved to occupy different niches- Modern types of honeycreeper include honey eaters, seed eaters, bark-creepers and woodpecker-like birds.

EASTER ISLAND: A TERRIBLE WARNING

The people of Easter Island crossed the ocean to create a peaceful and prosperous 1,000-year civilization. But then their culture collapsed into war and mass starvation. It's a lesson we have to learn from.

The most isolated piece of inhabited land on the planet is in the South Pacific, 3,765 kilometres west of South America and 2,253 kilometres south-east of the nearest island. Easter Island is famous for its astonishing Stone Age culture — hundreds of enormous stone statues, many of them standing on massive stone platforms. However, the story of the island is also a warning to us all.

The civilization that produced these amazing constructions has now nearly died out. Today, Easter Island is a 166-square-kilometre museum to that civilization. Most researchers believe that the first colonists arrived in the first centuries AD and that Easter Island's stone structures were well developed by the 7th century. The archeological record suggests a single unbroken culture, so there was probably just one major arrival of people by canoe. But once settled on the island, the colonists were trapped — it became their whole world.

Over its three million years of existence before humans came along, Easter Island had developed a balanced ecosystem. This natural balance was disturbed by the arrival of voyagers, probably a few dozen Polynesians. During this early period, the islanders built simple types of platform, with small statues either on or in front of them.

The second period of the island's history, from about AD 1,000 to 1,500, was its golden age. As they became more prosperous, the people devoted great energy to building bigger and better ceremonial platforms and hundreds of large statues. As the population grew, probably reaching between 10,000 and 20,000 in about 1,500, the need for land increased. There is also evidence of a serious decline of the forest.

The third and final period saw the tragic collapse of the earlier way of life. The causes of the

island's change and decline were complex, but mainly due to one thing — the destruction of large-numbers of trees. Starting at least 1,200 years ago, this meant that there were almost no large trees left by the time the Europeans came in the 18th century.

Without these trees, statues could no longer be moved and nor could ocean-going canoes be built. So the population was cut off from the important protein supply of deep-sea fish. Deforestation also caused massive soil erosion, which damaged the island's potential for growing crops.

It is impossible to know exactly what happened on Easter Island as there are no records. What is certain is that the civilization collapsed because of population growth, together with the decline in food and the great expense of effort on wasteful activities (platform building, statue carving and transportation). Starvation led to raiding and violence — perhaps even to cannibalism.

By 1722, when the first Europeans arrived, it was all over. At that time the population was reduced to about 2,000, living in poverty in the ruins of their former culture. The Easter Island story provides a model for disaster. The parallel between the ecological disaster on Easter Island (isolated in the Pacific) and that is happening elsewhere on planet Earth (isolated in space) is far too close for comfort.

NATIONAL PARKS (US ENVIRONMENTAL PROTECTION AGENCY)

Approximately 30 per cent of the nation's land is owned by the public. In the 11 contiguous states west of the 100th meridian, approximately 50 per cent is owned by the federal government, including 80 per cent of Nevada. About two- thirds of the land in Alaska is owned by the federal government. Although most of these public lands are owned by the federal government, many states also have large parks and state forests; and most coastal wetlands below mean high water are owned by the state.

The nation's publicly owned lands are put to a variety of uses. About 80 million acres are managed by the Park Service for the "enjoyment of future generations." Over 95 million acres, much of which is in Alaska, is part of the Wilderness Preservation System of roadless areas that Congress directed should remain "untrammeled by man". Another 84 million acres are part of the Fish and Wildlife Service's National Refuge system. About 200 million acres is part of the National Forest system, and the Bureau of Land Management holds approximately 260 million acres. Commercial grazing is an important use on 100 million acres of National Forest land and 160 million acres managed by the Bureau of Land Management.

The diversity of National Parks and other public lands mirrors the diversity of the nation from which these lands are drawn. As a result, global warming will have the same types of impacts on these lands as occur in areas that are not owned by the government. Sea level rise will tend to erode and inundate the beaches of the National Seashores and the wetlands of various National Wildlife Refuges and National Parks in coastal areas. Regional climate change combined with the fertilizing effect of 2°C in the atmosphere will have the same effect on forests within National Parks and National Forests as occur in other forests. The intensification of evaporation and precipitation will tend to increase the frequency during which Wild and Scenic Rivers experience either extreme floods or extremely low flows of water.

Nevertheless, the impacts of climate change on public lands differ from the implications elsewhere in two fundamental respects. First, they are often unique. Yellowstone, Yosemite, Everglades, and many other National Parks were created because previous generations reached a national consensus that it was important to preserve these unusual areas in their natural state forever. Blackwater, Edmund Forsythe, Audubon, and other National Wildlife Refuges were respective regions, but today these refuges provide unique habit within their regions because the surrounding areas have been subjected to agricultural and urban development. EPA, in cooperation the National Park Service, has prepared a series of case studies on the potential impacts of climate change on selected national parks and other wildlands in the western mountains and plains, the Great Lakes region, the Chesapeake Bay, and South Florida.

Second, the importance and public ownership of these areas may present unique opportunities for ensuring their survival as climate changes. As temperatures warm, the natural northward migration of many ecosystems may be blocked by highways and urban development; and many scientific studies

have concluded that terrestrial species will require the creation of special migration corridors. Because the federal government often owns much of the land surrounding western National Parks, Refuges, and Wilderness areas, it may be possible to create such corridors without interfering with private uses of land. In coastal areas, many states will find it difficult to enact the land-use planning necessary to ensure the landward migration of coastal ecosystems as sea level rises; but the unique legal status and greater financial power of federal land managers may enable landward migration of National Wildlife Refuges.

Finally, many decision makers have difficulty addressing long-term issues like global warming. Many land use planners and other environmental managers, for example, feel that they can not justify acting today simply to save an ecosystem that would otherwise be eliminated one hundred years hence. That perspective, however, is less applicable to federal protected areas. The reason that the National Park System was created in the first place was that the President and Congress decided that the Nation's policy would be that some unique natural areas would remain pristine for all succeeding generations. Thus, in the case of National Parks and other protected areas, plans to ensure their continued viability as the earth warms are simply continuations of a policy that has been in force since the Presidency of Theodore Roosevelt.

DISAPPEARING WORLD

The destruction of the rainforests is a pressing problem of our times but not one that is regarded equally seriously by everyone. The more affluent nations regard the issue as one of preservation; deforestation must stop. When it comes to the purer countries, the issue is not so cut and dried. For these people, the rainforests represent a source of economic prosperity, a point that obviously takes precedence over ecological concerns. A solution must be found before the damage caused by the deforestation that is destroying the rainforests becomes irrevocable.

Deforestation is carried out by those involved in the timber industry and also by migrant farmers. The latter occupy an area of land, strip it, farm it until its natural mineral supply is used up and then move on. The land is left useless and exposed and a process of erosion comes into effect, washing soil into rivers thereby killing fish and blocking the water's natural course.

The land is not the only victim. Rainforests are a richly populated habitat. In the rainforests of Madagascar there are at least 150,000 individual species of plants and animals which are found nowhere else in the world and more are being discovered all the time. Furthermore, approximately 50 per cent of all endangered animal species live in the world's rainforests. The destruction of the forests effectively represents a complete removal of all these plants and animals. Deprived of their natural environments, they will disappear altogether. Again, this process is irreversible. Man, no matter how powerful he considers himself, does not have the power to re-establish the species he is so willfully destroying.

POISONOUS SEALIFE

One of the most lethal poisons on Earth, ten thousand times more deadly than cyanide, is tetrodotoxin, more concisely known as TTX. Its potency is well known in East Asia, where it regularly kills diners who have braved the capricious delicacy known as fugo or puffer fish.

This toxin has a terrifying method of operation: twenty- five minutes after exposure, it begins to paralyse its victims, leaving the victim fully aware of what is *happening.* Death usually results, within hours, from suffocation or heart failure. There is no known antidote. If lucky patients can withstand the symptoms for twenty-four hours, they usually recover without further complications.

It is no ordinary poison. What is strange about its occurrence is that it is found in such a wide range of creatures, from algae to angelfish spanning entire kingdoms of life. It is rather unlikely that such an unusual toxin evolved independently in so many unrelated animals.

Marine biologists have discovered that the poison is produced by bacteria living in the gut of its

host. The best explanation is that a symbolic relationship exists between host and the not unwelcome guest, where microbes exchange poison for nutrients, providing a valuable defensive weapon for its host.

Критерии оценки:

1. оценка «отлично» выставляется студенту, если он правильно выполнил 10 заданий из 10;
2. оценка «хорошо» выставляется студенту, если он правильно выполнил 8 заданий из 10;
3. оценка «удовлетворительно» выставляется студенту, если он правильно выполнил 6 заданий из 10;
4. оценка «неудовлетворительно» выставляется студенту, если он правильно выполнил менее 50% заданий;