КАФЕДРА ИНОСТРАННЫХ ЯЗЫКОВ

**ФОНД**

**ОЦЕНОЧНЫХ СРЕДСТВ**

**ПО УЧЕБНОЙ ДИСЦИПЛИНЕ (модулю) «Иностранный язык»**

**1**. **Назначение фонда оценочных средств по дисциплине**

**«Иностранный язык»**

Фонд оценочных средств (ФОС) разработан в соответствии с требованиями основной образовательной программы (ООП) и Образовательного стандарта НИЯУ МИФИ по направлению подготовки 01.04.02 Прикладная математика и информатика программы дисциплины (модуля) «Иностранный язык».

Цель данных методических материалов – обеспечить научно-методическую основу для организации и проведения текущего и промежуточного контроля по дисциплине «Иностранный язык» по направлению подготовки 01.04.02 Прикладная математика и информатика. Текущий контроль – это вид планомерной и регулярной проверки знаний, умений, навыков магистрантов. Задача текущего контроля – получить объективные данные о ходе и качестве усвоения учебного материала, установить систематический контроль над учебной деятельностью, а также стимулировать регулярную целенаправленную работу магистрантов. Задача промежуточного контроля – получить объективные данные о степени освоенности большинства дидактических единиц, подлежащих контролю в рамках дисциплины «Иностранный язык».

Контрольно-оценочные средства (КОС) предназначены для контроля и оценки образовательных достижений магистрантов, освоивших программу учебной дисциплины (модуля) «Иностранный язык» по направлению подготовки 01.04.02 Прикладная математика и информатика. В состав фонда оценочных средств по дисциплине «Иностранный язык» входят:

* паспорт фонда оценочных средств текущего контроля и промежуточной аттестации;
* кодификация и краткое описание элементов контролируемой компетенции;
* результаты освоения дисциплины, подлежащие проверке;
* распределение оценочных средств по элементам ЗУН текущего контроля и промежуточной аттестации;
* структурированная база контрольных оценочных средств (КОС);
* методические материалы, определяющие процедуру контроля и критерии оценивания, методы интерпретации результатов.

КОС включают в себя контрольные материалы для проведения текущего контроля и промежуточной аттестации, а также оценочные материалы для проведения итоговой аттестации по дисциплине.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Семестр** | **Интерактив** | **Трудоемкость, кред.** | **Общий объем курса, час.** | **Лекции, час.** | **Практич. занятия, час.** | **Лаборат. работы, час.** | **СРС, час.** | **КСР, час.** | **Форма(ы) контроля, экз./зач./КР/КП** |
| 1 |  | 2 | 72 | 0 | 32 | 0 | 40 | 0 | З |
| ИТОГО | 0 | 2 | 72 | 0 | 32 | 0 | 40 | 0 |  |

**2. Разработка фонда оценочных средств по дисциплине**

**«Иностранный язык»**

**2.1.Паспорт фонда оценочных средств текущего контроля и промежуточной аттестации**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **№ семестра** | **Контролируемые разделы дисциплины** | **Контролируемые компетенции (или их элементы)** | | **Вид**  **контроля** | **Представление оценочного средства в фонде** | **График выполнения** |
| 1 | I. Изучение лексико-грамматических средств выражения интенций в письменной и устной формах | УК-4  УК-5 | З 1  З 2  З 6  У 1  В 2  В 5  В 6 | Входной | Комплект контрольных работ по вариантам  3.1. | 1 неделя семестра |
| З 3  З 4  У 3  В 1  В 2  В 3  В 6 | Текущий | Перечень тем для проведения дискуссии, полемики, диспута, дебатов  3.2.3. | 1, 5 недели семестра |
| З 1-З 3  У 1  В 2  В 5 | Комплект контрольных работ по вариантам  3.2.1. | 8 неделя |
| 2. | II. Второй раздел | З 3  З 4  У 3  В 1  В 2  В 3  В 6 | Текущий | Перечень дискуссионных тем для проведения «круглого стола».  3.2.4. | 10 неделя семестра |
| З 6  У 2  У 5  У 6  У 7  В 6 | Темы групповых и/или индивидуальных творческих заданий для самостоятельной работы  3.2.5. | 11-14 недели |
| З 3  З 4  З 6  У 3  У 4  У 6  В 1  В 2  В 6 | Темы докладов, презентаций  3.2.2. | 15 неделя семестра |
| З 1  З 2  З 6  У 1  В 2  В 5  В 6 | Промежуточный | Комплект контрольных работ по вариантам  3.3.1.  Вопросы к зачёту 3.3.2  Зачётный материал 3.3.3. | 16 неделя |
| 3. | Зачет | УК-4  УК-5 |  | Итоговая аттестация | Вопросы к зачету 3.4 |  |

**2.2. Кодификация и краткое описание элементов контролируемой компетенции.**

|  |  |
| --- | --- |
| УК-4 - способен применять современные коммуникативные технологии, в том числе на иностранном(ых) языке(ах), для академического и профессионального взаимодействия  УК-5 - способен анализировать и учитывать разнообразие культур в процессе межкультурного взаимодействия | |
| Знание 1(З1) | особенностей устного и письменного профессионально ориентированного иностранного языка |
| Знание 2(З2) | различий в области фонетики, лексики, грамматики, стилистики родного и английского языков; |
| Знание 3(З3) | деловой и профессиональной лексики иностранного языка в объеме, необходимом для общения, чтения и перевода иноязычных текстов общей и профессиональной направленности |
| Знание 4(З4) | этикета делового/научного общения |
| Знание 5(З5) | поведенческих моделей носителей языка. |
| Знание 6(З6) | о мире науки и представления о месте человека в нём и основных реалий страны изучаемого языка |
| Умение 1 (У1) | интерпретировать и анализировать иноязычную научную литературу |
| Умение 2 (У2) | вести научную /деловую корреспонденцию на иностранном языке |
| Умение 3(У3) | находить, анализировать и структурировать иноязычный материал по теме публичного выступления (доклад, презентация) |
| Умение 4(У4) | использовать современные мультимедийные средства при изложении результатов своей профессиональной деятельности на иностранном языке. |
| Умение 5(У5) | конструктивно взаимодействовать в социальном окружении |
| Умение 6(У6) | выступать в роли медиатора культур (межкультурная коммуникация) |
| Умение 7 (У7) | работать с информационно-справочным материалом по своей специальности . |
| Владение 1(В1)  навыками | делового общения для осуществления межкультурной коммуникации на иностранном языке |
| Владение 2 (В2)  навыками | изложения мысли в чёткой последовательности в письменной и устной формах |
| Владение 3 (В3)  навыками | ведения научной дискуссии в области своей профессиональной деятельности на иностранном языке |
| Владение 4 (В4)  навыками | работы с профессиональной терминологией на иностранном языке |
| Владение 5(В5)  навыками | письменного перевода на русский язык общеупотребительных англоязычных лексико-грамматических паттернов. |
| Владение  навыками 6(В 6) | поиска и обработки информации о достижениях в области российской и зарубежной науки и техники; поиска инновационных путей решения постоянно усложняющихся задач в области профессиональной деятельности |

**2.3. Результаты освоения дисциплины, подлежащие проверке:**

|  |  |
| --- | --- |
| **Результаты обучения (освоенные умения, усвоенные знания, развитые навыки)** | **Основные показатели оценки результатов** |
| З 1. Знание особенностей устного и письменного профессионально ориентированного иностранного языка. | Демонстрация знания особенностей устного и письменного профессионально ориентированного иностранного языка. |
| З 2. Знание различий в области фонетики, лексики, грамматики, стилистики родного и английского языков. | Демонстрация знания различий в области фонетики, лексики, грамматики, стилистики родного и английского языков. |
| 3 3. Знание деловой и профессиональной лексики иностранного языка в объеме, необходимом для общения, чтения и перевода иноязычных текстов общей и профессиональной направленности. | Демонстрация знания деловой и профессиональной лексики иностранного языка в объеме, необходимом для общения, чтения и перевода иноязычных текстов общей и профессиональной направленности. |
| З 4. Знание этикета делового/научного общения. | Демонстрация знания этикета делового/научного общения. |
| З 5. Знание поведенческих моделей носителей языка. | Демонстрация знания поведенческих моделей носителей языка. |
| З 6. Знание о мире науки и представления о месте человека в нём и основных реалий страны изучаемого языка. | Демонстрация знания о мире науки и представления о месте человека в нём и основных реалий страны изучаемого языка. |
| У 1. Умение интерпретировать и анализировать иноязычную научную литературу. | Демонстрация умения интерпретировать и анализировать иноязычную научную литературу. |
| У 2. Умение вести научную /деловую корреспонденцию на иностранном языке. | Демонстрация умения вести научную /деловую корреспонденцию на иностранном языке |
| У 3. Умение находить, анализировать и структурировать иноязычный материал по теме публичного выступления (доклад, презентация). | Демонстрация умения находить, анализировать и структурировать иноязычный материал по теме публичного выступления (доклад, презентация). |
| У 4. Умение использовать современные мультимедийные средства при изложении результатов своей профессиональной деятельности на иностранном языке. | Демонстрация умения использовать современные мультимедийные средства при изложении результатов своей профессиональной деятельности на иностранном языке. |
| У 5. Умение конструктивно взаимодействовать в социальном окружении. | Демонстрация умения конструктивно взаимодействовать в социальном окружении. |
| У 6. Умение выступать в роли медиатора культур (межкультурная коммуникация). | Демонстрация умения выступать в роли медиатора культур (межкультурная коммуникация). |
| У 7. Умение работать с информационно-справочным материалом по своей специальности. | Демонстрация умения работать с информационно-справочным материалом по своей специальности. |
| В.1 Владение навыками делового общения, принятыми в профессиональной среде, для осуществления межкультурной коммуникации на иностранном языке. | Сформированность навыков делового общения, принятыми в профессиональной среде, для осуществления межкультурной коммуникации на иностранном языке. |
| В 2. Владение навыками изложения мысли в чёткой последовательности в письменной и устной формах. | Сформированность навыков изложения мысли в чёткой последовательности в письменной и устной формах. |
| В 3. Владение навыками ведения научной дискуссии в области своей профессиональной деятельности на иностранном языке. | Сформированность навыков ведения научной дискуссии в области своей профессиональной деятельности на иностранном языке. |
| В 4. Владение навыками работы с профессиональной терминологией на иностранном языке. | Сформированность навыков работы с профессиональной терминологией на иностранном языке. |
| В 5. Владение навыками письменного перевода на русский язык общеупотребительных англоязычных лексико-грамматических паттернов. | Сформированность навыков письменного перевода на русский язык общеупотребительных англоязычных лексико-грамматических паттернов. |
| В 6. Владение навыками поиска и обработки информации о достижениях в области российской и зарубежной науки и техники; поиска инновационных путей решения постоянно усложняющихся задач в области профессиональной деятельности | Сформированность навыков поиска и обработки информации о достижениях в области российской и зарубежной науки и техники; поиска инновационных путей решения постоянно усложняющихся задач в области профессиональной деятельности. |

**2.4.Распределение оценочных средств по элементам ЗУН текущего контроля и промежуточной аттестации**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Содержание учебного материала по программе дисциплины (модуля)** | **У1** | **У2** | **У3** | **У4** | **У5** | **У6** | **У7** | **З1** | **З2** | **З3** | **З4** | **З5** | **З6** | **В1** | **В2** | **В3** | **В4** | **В5** | **В6** |
| **Семестр 3**  Раздел I  Углублённое изучение лексических, грамматических и стилистический средств, характерных для научно-технической статьи. Чтение аутентичного текста научной направленности.  Темы 1-8 | Кр1  Кр2 |  | Дс |  | Кр1 | Кр1  Кр2 | Дс | Кр1  Кр2 | Кр1  Кр2 | Дс Кр2 | Дс | Кр1  Дс | Кр1 | Дс | Кр1  Дс  Кр2 | Дс Кр2 |  | Кр1  Кр2 | Кр1  Дс |
| **Семестр 3**  **Раздел II**.  Стилистика и грамматики научно-технической статьи по специальности Основы перевода научно-технической литературы по специальности.  **Темы 9-16** | Кр3 | Тз | Кс Тз Пр | Пр  Кр3 | Тз | Тз Пр  Кр3 | Тз  Кс | Кр3 | Кр3 | Кс  Пр  Кр3 | Кс Пр  Кр3 |  | Тз Пр | Дс Тз Пр  Кс | Дс Пр | Дс Кр3 |  | Тз  Кс  Кр3 | Дс Тз Пр |

Принятые обозначения:

Кр1 - контрольная работа №1

Пр – презентация

Кс-«круглый стол»

Дс – дискуссия, полемика, дебаты

Тз – творческое задание (проект)

Ри - ролевая игра

Эс – эссе

**3. Структурированная база учебных заданий**

**3.1. Контрольные оценочные средства (КОС) входного контроля.**

**Tест 1**

**(магистратура, тест для входного контроля, I раздел 3 семестр)**

**Вариант №1**

**Задание №1. Заполните пропуск.**

Millions of chemicals are released into the \_\_\_\_\_\_\_\_\_\_\_and end up in the soil.

A: public domain

B: wild

C: forest

**D: environment**

**Задание №2. Заполните пропуск.**

Memory is the capacity\_\_\_\_\_\_\_\_\_\_\_ and recall new information.

A: to read

B: to hold

C: to divide

**D: to store**

**Задание №3. Заполните пропуск.**

Although our components are of traditional \_\_\_\_\_\_\_\_\_, the way they are assembled is very innovative.

A: approach

**B: design**

C: discipline

D: question

**Задание №4. Заполните пропуск.**

We discuss three papers that we believe are most \_\_\_\_\_\_\_\_\_\_to our research.

**A: relevant**

B: successful

C: particular

D: redundant

**Задание №5. Заполните пропуск.**

The paper was extremely long and must be massively reduced in \_\_\_\_\_\_\_\_\_\_\_\_\_.

A: quality

**B : length**

C: memory

D: value

**Задание №6. Заполните пропуск.**

I would like to see some concrete examples , \_\_\_\_\_\_\_\_\_\_\_\_\_\_the somewhat long-winded technical explanations that were not very clear.

A: because

**B: rather than**

C: that

D: and

**Задание №7. Заполните пропуск.**

Liquids are generally identified in paint samples by evaluating the characteristic ratio values of fatty acid amounts and comparing them \_\_\_\_\_\_\_\_\_\_reference samples.

A: on

B: forward

C: at

**D: with**

**Задание №8. Заполните пропуск.**

\_\_\_\_\_\_\_\_\_\_\_\_ probe can be heated in two different ways.

**A: The**

B: A

C: –

D: An

**Задание №9. Заполните пропуск**

This index was evaluated \_\_\_\_\_\_\_\_\_\_\_\_the correlation function.

A: to use

B: being used

**C: using**

D: used

**Задание №10. Заполните пропуск.**

Several heavy metals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to be carcinogenic compounds.

A: is known

B: is knowing

**C: are known**

D: to be known

**Задание №11. Заполните пропуск.**

The salient results\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the following.

A: will summarize

**B: are summarized**

C: are summarizing

D: has summarized

**Задание №12. Заполните пропуск.**

Those students \_\_\_\_\_\_\_\_\_to participate in the conference should contact Mr.Green.

**A: wishing**

B: to wish

C: to have wished

D: wished

**Задание №13. Заполните пропуск.**

Professor Dopkin teaches the students \_\_\_\_\_\_\_\_\_\_he has a good level of English.

A: in spite

B: and

**C: since**

D: that

**Задание №14. Заполните пропуск.**

In the future when the technology has improved , it \_\_\_\_\_\_\_\_possible to build a spaceship that can travel to distant planets.

**A: may be**

B: mustn’t have been

C: need not be

D: wasn’t

**Задание №15. Заполните пропуск.**

You must know the difference \_\_\_\_\_\_\_\_\_\_\_\_\_\_a solid and a gas.

A: in

B: on

C: up

**D: between**

**Задание №16. Выберите реплику, наиболее соответствующую ситуации общения.**

Speaker 1. – Good evening! Nice to see you again, Mr Semenov! How are you?

Speaker 2. – \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Speaker 1. – Very well. I always feel well in beautiful weather like this. We have a lot of rain in England at this time of year. So I’m happy to be in Moscow now…

A: I don’t know.

**B: Not bad, thank you. And you?**

C: I suppose, we had better get down to business.

D: Thankyou.

**Задание №17. Выберите реплику, наиболее соответствующую ситуации общения.**

Speaker 1. – Good afternoon. My name is Ryder.I’m from ‘Smith and Co.’ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Speaker 2. – Good afternoon, Mr. Ryder. Mister Rogov is expecting you in a couple of minutes. Will you take a seat, please?

Speaker 1. – Thank you .

**A: I’ve got an appointment with Mr Rogov at 3 pm .**

B: I do not want to wait.

C: Can I have a cup of tea, please?

D: What is your name, please?

**Задание №18. Выберите реплику, наиболее соответствующую ситуации общения.**

* Speaker 1 - Hello.
* Speaker 2. Michael speaking.
* Speaker 1 - Hello, Michael, this is Lora. I’m calling to invite you to my birthday party next Saturday.
* Speaker 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Lora. I am terribly sorry but I can’t come. I work on Saturdays.

A: Congratulations!

B: Could you call back later?

C: Merry Christmas

**D: Happy Birthday!**

**Задание №19. Выберите реплику, наиболее соответствующую ситуации общения.**

Your friend: “Is Ann here?”

You: “Yes, wait a minute. \_\_\_\_\_\_\_\_\_ .”

A: Can you lie down ?

**B: I’ll get her.**

C: What is your surname, please?

D: We don’t really get on with her.

**Задание №20. Выберите реплику, наиболее соответствующую ситуации общения.**

Woman: “I’m Barbara Schulz from Berlin office. How do you do?

Man: “ \_\_\_\_\_\_\_\_\_\_\_”

A: Hello, everyone!

B: What do you want?

**C: Nice to meet you,Ms Schulz.**

D: Hi, Barbara!

**Задание №21. Заполните пропуск.**

In 1865, \_\_\_\_\_\_\_\_\_\_\_prediction that light was an electromagnetic wave seemed to be the final blow to particle models of light.

A: Lomonosov’s

B: Faraday’s

**C: Maxwell's**

D: Hilbert’s

**Задание №22. Заполните пропуск.**

\_\_\_\_\_\_\_\_\_\_\_\_was founded in Los Gatos , California on 1 April, 1976 by Steve Jobs, Steve Wozniak and Ronald Wayne.

A: Hewlett Packard

**B: Apple Computer**

C: Dell Inc.

D: Lenovo Group Limited

**Задание №23. Заполнитепропуск.**

It is impossible to swim in \_\_\_\_\_\_because of the large amount of salt in it.

**A: the Dead Sea**

B: the Laptev Sea

C: the Sea of Okhotsk

D: the Bering Sea

**Задание №24. Заполнитепропуск.**

One of the adventures of \_\_\_\_\_\_\_\_\_\_is the story of Polyphemus the Cyclops, a one-eyed giant.

A: Prometheus

B: Perseus

**C: Odysseus**

D: Orpheus

**Задание №25. Определите, к какому виду делового документа относится представленный ниже отрывок.**

|  |
| --- |
| Family name:  First Name:  Sex:  Date of Birth:  Town and country of Birth:  Nationality:  Occupation:  Contact Address in the UK:  Passport no.:  Place of issue :  Length of stay in the UK:  Post of last departure:  Arrival flight:  Signature: |

A: Letter of inquiry

**B: Landing Card**

C: Memo

D: Job advertisement

**Задание №26. Выберите слова или сочетания слов для заполнения пропусков так, чтобы они отражали особенности оформления служебной записки.**

1. \_\_\_\_\_\_\_\_ : “Professor Belov”

From : (2) \_\_\_\_\_\_\_\_\_\_ .

(3)\_\_\_\_\_\_\_\_\_ : Symposium.

4)\_\_\_\_\_\_\_\_\_\_\_\_\_ 13 Feb.

The National Committee of Ecology is planning to arrange a Symposium in early September and request you to present a paper on one of the following topics:

1.Air pollution

2.Noise pollution

3.Man and his environment

Will you kindly let us have an early reply informing us on the subject of your report.

With best wishes

Yours sincerely,

Semyon S. Levitin

A: Secretary General

B: Subject

C: To

D: Date

**Прочитайте текст и выполните задания**

1. More than two decades have passed since the word “globalization” started showing up with any frequency in discussions of business and economics.

Later on, things became more complex. Asian companies started designing and assembling products in the West. Western companies open up new fronts by sending jobs abroad-not just in manufacturing but in service industries as well.

2. At the turn of the millennium, there was a lot of talk about whether globalization was a Good Thing or a Bad Thing. One side argued that it allowed big, multinational corporations to exploit workers in poor countries to pad their profit margins. The other side retorted that the expansion of these corporations into the developing world offered the best hope for rising living standards. One side complained that globalization was creating and destroying industries too quickly for the labor force to adjust. The other side answered that these shifts were rapidly improving the world’s ability to use its resources efficiently.

3. Now it’s pretty clear that globalization, be it good or bad, is Unavoidable Thing. Rather than dealing with the problems of globalization head-on, it can be tempting to try to slow the process. Yet that’s likely to postpone the problems, not solve them. Unless every country simultaneously decides to close its borders to commerce migration and financial transactions, globalization will continue. Tariffs exist, of course, as do restrictions on foreign workers and foreign investment. But as technology for moving goods, people and information improves, globalization will accelerate.

(Daniel Altman .Managing Globalization: If it’s Here To stay, What do we do Now?)

**Задание №27. Определите, является ли утверждение:**

Globalization creates and destroys industries too quickly.

**A: истинным**

B: ложным

C: в тексте нет информации

**Задание № 28. Определите, является ли утверждение:**

Globalization allows big companies to exploit workers in poor countries.

**A: истинным**

B: ложным

C: в тексте нет информации

**Задание № 29. Определите, является ли утверждение:**

Globalization creates winners and losers.

A: истинным

B: ложным

**C: в тексте нет информации**

**Задание № 30. Определите, является ли утверждение:**

The debate over globalization began with discussions about cheap imports.

A: истинным

B: ложным

**C: в тексте нет информации**

**Задание № 31. Укажите, какой части текста (1, 2, 3) соответствует следующая информация:**

Globalization is unavoidable.

A: 1

B: 2

**C: 3**

**Задание № 32. Укажите, какой части текста (1, 2, 3) соответствует следующая информация:**

Western companies open up new companies in Asia.

**A: 1**

B: 2

C: 3

**Задание №33. Ответьте на вопрос:**

How does the author make the point that globalization is unavoidable?

**A: by proposing an impossible world – wide requirement to stop globalization**

B: by showing how tariffs, laws and economics are complicated without globalization

C: by detailing arguments in favor of expanding globalization

**Задание № 34. Определите основную идею текста.**

A: World leaders need to consider choices like language education, research and tariffs.

B: The most effective way to prepare people for globalization is to teach them “to learn how to learn”.

**C: Globalization cannot be avoided; in fact it is accelerating.**

**Tест 1**

**(магистратура, тест для входного контроля, I раздел 3 семестр)**

**Вариант №2**

**Задание №1. Заполните пропуск.**

Our method \_\_\_\_\_\_\_\_\_\_ on a sample pre-treatment that only requires a minimal level of dilution.

A: negligible

B: understand

C: similar

**D: relies**

**Задание №2. Заполните пропуск.**

It is well \_\_\_\_\_\_\_\_\_\_\_that tests of language skills are best carried out under situations under stress.

**A: known**

B: depended

C: obtained

D: created

**Задание №3. Заполните пропуск.**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2 is the main result of our study.

A: Word

**B: Equation**

C: Impact

D: Field

**Задание №4. Заполните пропуск.**

Our results highlight that Panama \_\_\_\_\_\_\_\_\_\_\_is unlikely to infect sound fruit , but rather it is wounds that make fruit susceptible to infection.

A: packing

B: manner

**C: disease**

D: decision

**Задание №5. Заполните пропуск.**

We believe that there are three possible ways of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_our findings.

A: causing

**B : interpreting**

C: dealing

D: managing

**Задание №6. Заполните пропуск.**

This paper is written\_\_\_\_\_\_\_\_\_\_, moreover much of the data is inaccurate.

**A: badly**

B: goodly

C: fastly

D: cleanly

**Задание №7. Заполните пропуск.**

Bilingual children are believed to adapt to new situations\_\_\_\_\_\_\_\_\_\_\_ than monolingual children.

**A: better**

B: best

C: good

D: goodest

**Задание №8. Заполните пропуск.**

Most scientists work with \_\_\_\_\_\_\_\_\_\_\_computers.

A: an

B: a

**C: –**

D: the

**Задание №9. Заполните пропуск**

In these particular circumstances yellow may be preferable \_\_\_\_\_\_\_\_\_\_\_ red.

A: towards

B: in terms of

C: despite

**D: to**

**Задание №10. Заполните пропуск.**

Population \_\_\_\_\_\_\_\_\_\_\_\_\_the number of people who live in a particular area.

A: is meaning

**B: means**

C: has meant

D: will mean

**Задание №11. Заполните пропуск.**

It was found that the containers for the samples \_\_\_\_\_\_\_\_\_\_\_\_.

A: are been contaminated

**B: had been contaminated**

C: is contaminated

D: will contaminate

**Задание №12. Заполните пропуск.**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_in this way, the data take on a different meaning.

A: To being viewed

B: To viewing

C: To view

**D: Viewed**

**Задание №13. Заполните пропуск.**

Our results may be a demonstration that dogs are more intelligent \_\_\_\_\_\_\_\_\_\_\_cats.

**A: than**

B: and

C: as

D: that

**Задание №14. Заполните пропуск.**

This factor \_\_\_\_\_\_\_\_\_\_\_ be responsible for the increase in quantum entanglement.

A: probably

B: have

C: likely

**D: may**

**Задание №15. Заполните пропуск.**

Our data fit perfectly \_\_\_\_\_\_\_\_\_\_\_\_\_ those of Pavlov.

A: of

**B: with**

C: up

D: out

**Задание №16. Выберите реплику, наиболее соответствующую ситуации общения.**

Speaker 1. – Hello!

Speaker 2. – May I speak to Mr Stepanov , please?

Speaker 1. – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Speaker 2. – This is Stevenson from Crownpoint Consulting Services.

A: I don’t know.

B: I’m short of time.

**C: Who’s calling, please?**

D: What for?

**Задание №17. Выберите реплику, наиболее соответствующую ситуации общения.**

Speaker 1. – \_\_\_\_\_\_\_\_\_\_\_\_\_\_. British Airways.

Speaker 2. – Good evening. Can you please connect me with someone who can tell me when the morning plane arrives from London ?

Speaker 1. – \_\_\_\_\_\_\_\_\_\_\_ .

A: Hello.

**B: Good evening**

C: Hi.

D: Reception desk.

**Задание №18. Выберите реплику, наиболее соответствующую ситуации общения.**

* Crownpoint Consulting Services. Good afternoon. \_\_\_\_\_\_\_\_\_\_\_\_\_\_?
* I’d like to speak to Mr Stevenson, please.
* Will you hold the line, please?

**A: Can I help you?**

B: Could you spell your name, please?

C: What shall we start with today?

D: Could you hold on for an hour?

**Задание №19. Выберите реплику, наиболее соответствующую ситуации общения.**

Your friend: “ Hello, Pete. Haven't seen you for ages. How are you?”

You: “ \_\_\_\_\_\_\_\_\_ .”

A: Great. I'm having such a good time. I used to study harder when I was at secondary school.

B: Well, I'm in real trouble if I don't pass my physics exam.

**C: Hello, Alex . Frankly speaking, so-so. And you?**

D: I’m short of money at the moment.

**Задание №20. Выберите реплику, наиболее соответствующую ситуации общения.**

Woman: “Excuse me, please, can you tell me the way to the nearest post office?”

Man: “ \_\_\_\_\_\_\_\_\_\_\_”

A: And where is the metro station?

B: What do you want?

C: Is it far from here?

**D: I'm sorry, I can't. I'm a stranger here too. You'd better ask someone else.**

**Задание №21. Заполните пропуск.**

\_\_\_\_\_\_\_\_\_\_\_\_was founded in Los Gatos , California on 1 April, 1976 by Steve Jobs, Steve Wozniak and Ronald Wayne.

A: Hewlett Packard

**B: Apple Computer**

C: Dell Inc.

D: Lenovo Group Limited

**Задание №22. Заполните пропуск.**

Roman mathematics had no \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A: thirteen

B: thousand

C: ten

**D: zero**

**Задание №23. Заполните пропуск.**

The two official languages of Canada are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A: German and English

B: Spanish and French.

**C: French and English**

D: Spanish and English

**Задание №24. Заполните пропуск.**

The idea that a man’s voice could travel through a wire was considered something akin to witchcraft when it was first proposed, but by the time \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_patented his “electric telegraph” in March of 1876, it was not only a reality, but was to forever change the country.

A: Benjamin Franklin

B: James Dean

C: Alfred Nobel

**D: Alexander Bell**

**Задание №25. Определите, к какому виду делового документа относится представленный ниже отрывок.**

|  |
| --- |
| Dear Mr. Mann,  I saw your job advertisement for a Journalist in today’s Independent newspaper. I am very interested in the job and I believe I have all necessary skills.  I studied politics and languages at Oxford University. I am master in Spanish and French. I had business trips in Europe and North America, and at the same time I worked as a business journalist for the NBA Company during the last three years.  I enclose a copy of my CV. I look forward to hearing from you soon. Please let me know if you need any more information.  Yours sincerely,  Peter Grey |

A: Letter of inquiry

**B: Job application letter**

C: Memo

D: Job advertisement

**Задание №26. Выберите слова или сочетания слов для заполнения пропусков так, чтобы они отражали особенности оформления служебной записки.**

1. \_\_\_\_\_\_\_\_ : “Marketing Department ZAO Innovative products”

From : (2) \_\_\_\_\_\_\_\_\_\_ .

(3)\_\_\_\_\_\_\_\_\_ : Customer Presentation.

Date: \_\_\_\_\_\_\_\_\_\_\_

The New Product Marketing presentation you prepared 2 weeks ago was excellent!

Your enthusiasm, sales strategy, and product knowledge were exceptional and certainly sealed the deal with several business partners.

Thank you very much for your work and dedication!

My congratulations to all of you!

Sincerely yours,

Peter White

A: Peter White .

Managing director ZAO Innovative products

B: Subject

C: To

D: June13, 2014.

**Прочитайте текст и выполните задания.**

1. People are making decisions every day that change the impact of globalization on their lives. Parents choose whether to pay for extra language lessons for their children. The chief executive in a dying industry weighs how much his company should invest in researching new products .A government minister tries to figure out how to keep her country’s brightest scientists from moving overseas.

Yet it is not easy to plan for the future without knowing what the future will look like. Back in the 1980s, Americans were encouraging their children to learn Japanese . Now, Chinese is the language of choice. Solar-powered cars were all the rage, then electrical hybrids. In the next decade, fuel cells may take over. Though India still watches as hundreds of its brightest graduates head to the United States every year, more and more are staying home to start their own businesses.

2. The ground-level challenges require flexible solutions. Developing specific skills, inventing specific technologies or passing specific laws to fit the circumstances of the moment may not be enough.

It may be more important to develop skills that help you to pick up more skills, to invent technologies that set the stage for generations of innovation , and to pass laws that open the door to several different kinds of regulation- in other words , to create a platform for flexible decision-making in the midst of rapid changes.

Education, pension rules, intellectual property laws, tax policy, research spending, job training and the financial system –all of these areas are feeling the effects of globalization.

3. The integration of the global economy is making every single topic more complex. But each one is also involved in the solutions to those big challenges.

With that knowledge in hand, a few more winners may appear on the battlefield of the global economy.

(Daniel Altman .Managing Globalization: If it’s Here to stay, What do we do Now?)

**Задание №27. Определите, является ли утверждение:**

It is impossible to know what changes globalization will bring.

**A: истинным**

B: ложным

C: в тексте нет информации

**Задание № 28. Определите, является ли утверждение:**

Around the year 2000, people debated the merits of globalization a lot.

A: истинным

B: ложным

**C: в тексте нет информации**

**Задание № 29. Определите, является ли утверждение:**

There is little point in talking whether globalization is good or bad.

A: истинным

B: ложным

**C: в тексте нет информации**

**Задание № 30. Определите, является ли утверждение:**

Individuals constantly make decisions in their own lives in response to globalization.

**A: истинным**

B: ложным

C: в тексте нет информации

**Задание № 31. Укажите, какой части текста (1, 2, 3) соответствует следующая информация:**

In the 80s Americans were encouraging their children to learn Japanese.

**A: 1**

B: 2

C: 3

**Задание № 32. Укажите, какой части текста (1, 2, 3) соответствует следующая информация:**

Integration of the global economy is making the solution of problems more difficult .

A: 1

B: 2

**C: 3**

**Задание №33. Ответьте на вопрос:**

How does the author make the point that globalization is inevitable?

**A: by detailing arguments in favor of expanding globalization**

B: by showing how laws, tariffs and economies are complicated without globalization

C: by treating impossible international requirements to stop globalization

**Задание № 34. Определите основную идею текста.**

A: World governments need to consider choices like language education, research and tariffs.

**B: Flexibility will probably be the most important skill for survival in the future.**

C: At the turn of the century, there was a lot of talk about whether it is pretty clear that globalization is an unavoidable thing.

**Входные** тестовые работы позволяют установить исходный уровень владения иностранным языком. Они способствуют обеспечению дифференцированного подхода к обучению и помогают сформировать учебные группы с учётом уровня языковой подготовки магистрантов. Объективность контроля обеспечивается за счёт количественной и качественной оценки результатов речевой деятельности магистрантов.

Входные тестовые работы состоят из 3 частей:

1. Лексико-грамматический тест закрытого типа (1-15), направленный на проверку сохранности знаний лексического и грамматического материала. В процессе выполнения теста обучаемый должен выбрать только один вариант ответа из четырёх предложенных.

Оценка результатов выполнения заданий выполняется с помощью специальной шкалы-матрицы. Один правильный ответ оценивается в один балл.

Максимальное количество баллов: 15.

1. Страноведческий тест закрытого типа (16-26), направленный на проверку сохранности знаний о стране изучаемого языка, правилах речевого этикета и делового письма.

Оценка результатов выполнения заданий выполняется с помощью специальной шкалы-матрицы. Один правильный ответ оценивается в один балл.

Максимальное количество баллов: 11.

1. Тестовые задания к тексту (27-34), направленные на проверку уровня владения навыками чтения и понимания иноязычного текста, а также анализа, переработки, систематизации и усвоения информации на иностранном языке. В процессе выполнения теста обучаемый должен выбрать только один вариант ответа из четырёх предложенных.

Оценка результатов выполнения заданий выполняется с помощью специальной шкалы-матрицы. Один правильный ответ оценивается в один балл.

Максимальное количество баллов: 8.

Максимальный балл за тест: 34.

Магистранты распределяются по учебным группам в зависимости от результатов теста.

**3.2. Контрольные оценочные средства (КОС) текущего контроля и критерии оценивания.**

**Текущие** тестовые работы позволяют судить об успешности овладения магистрантами иностранным языком и процессе становления и развития речевых навыков и умений, а также позволяют вносить своевременные коррективы в процесс обучения. Текущие тестовые работы направлены на проверку усвоения учащимися определённой части учебного материала. Объективность контроля обеспечивается за счёт количественной и качественной оценки результатов речевой деятельности магистрантов. Проведение текущих тестовых работ носит систематический характер и обеспечивает регулярную проверку усвоения полученных знаний и развития навыков в различных видах речевой деятельности.

Тесты для текущего контроля состоят из 2-х частей:

1. Лексико-грамматический тест закрытого типа (1-20), направленный на проверку усвоения лексического и грамматического материала на конкретном этапе обучения иностранному языку. В процессе выполнения теста обучаемый должен выбрать только один вариант ответа из четырёх предложенных.

Оценка результатов выполнения заданий выполняется с помощью специальной шкалы-матрицы, что обеспечивает максимальную объективность, оперативность и лёгкость подсчёта результатов. Один правильный ответ оценивается в один балл. Максимальное количество баллов: 10.

1. Лексический тест (специализированная лексика) (1-5), направленный на проверку уровня владения навыками лексики, способности использовать изученный лексико-грамматический материал на практике. Требования к выполнению лексических заданий:

* Лексика: магистрант должен использовать адекватный поставленной задаче словарный запас;

При соблюдении вышеупомянутых требований за каждое задание присваивается один балл. Максимальное количество баллов: 5.

Максимальный балл за тест: 25.

Минимальный допустимый балл: 15.

**3.2.1 Комплект контрольных работ по вариантам.**

**Контрольная работа 2 (3 семестр, I раздел)**

**Вариант№1**

I. Выберите ОДИН правильный вариант ответа:

1. About 40 % of young people go \_\_\_\_ to further education in Britain.

A. over

B. on

C. off

D. up

2. The bachelor’s degree consists \_\_\_\_ 8 modules.

A. up

B. in

C. of

D. from

3. If you wish to apply \_\_\_\_\_\_\_\_\_\_\_\_\_\_an intensive course, you should prepare your application carefully.

A. in

B. to

C. by

D. for

4. Our new software project is funded \_\_\_\_\_ the state.

A. by

B. from

C. for

D. with

5. This new hardware was developed \_\_\_\_\_\_ our department a few months ago.

A. by

B. with

C. from

D. of

6. Not all these benefits can be attributed \_\_\_\_ an increase in general well-being.

A. by

B. to

C. together with

D. with

7. Such a conclusion was based \_\_\_\_\_ my personal experience.

A. from

B. on

C. in

D. with

8. The CPU is made up \_\_\_\_ three main parts: Control Unit, Arithmetic Logic Unit and Immediate Access Store.

A. with

B. from

C. by

D. of

9. This very vaccine is injected \_\_\_\_\_ the arm or leg.

A. onto

B. with

C. into

D. for

10. Dehydration is common in older people if the weather is very hot, and those suffering \_\_\_\_ diabetes.

A. from

B. for

C. of

D. with

II. Выберите ОДИН правильный вариант ответа:

1. The skin cells \_\_\_\_\_\_\_\_\_\_ a speed of fifty micrometers an hour.

A. run with

B. pace with

C. move at

D. step up at

2. Previously the treatment \_\_\_\_\_ back pain was bed rest, but these days many doctors recommend light exercise.

A. for

B. from

C. opposite

D. to

3. In some countries learning a foreign language is \_\_\_\_\_\_\_\_\_, whereas in other countries a student can decide whether to learn a language or not.

A. additional

B. extra

C. tertiary

D. compulsory

4. Do you know how to \_\_\_\_\_\_\_ data from a crashed hard drive?

A. retrieve

B. search

C. find

D. fix

5. The quantity of electric \_\_\_\_\_\_\_ can be directly measured with an electrometer.

A. cartridge

B. shot

C. charge

D. support

6. Core \_\_\_\_\_ has typically been highly emphasized in Soviet and Russian universities and technical institutes.

A. schedule

B. timetable

C. courses

D. curriculum

7. If you want to buy a vacuum cleaner, go to a store for home \_\_\_\_\_\_\_\_\_\_\_.

A. tools

B. appliances

C. instruments

D. gadgets

8. If you want to succeed you need to choose a suitable time to study, i.e. when it is quiet and when you are most \_\_\_\_\_\_\_\_.

A. alert

B. subconscious

C. dull

D. awake

9. On the one \_\_\_\_\_\_\_, addiction feels so good that you want to use more. On the other \_\_\_\_\_\_\_\_\_, addiction leads to negative consequences.

A. side, side

B. hand, hand

C. part, part

D. shore, shore

10. So, hold \_\_\_\_\_\_ your seats — it's going to be a bumpy ride!

A. on to

B. in to

C. --

D. with

III. Подчеркни наиболее подходящее слово:

1. A microchip is a set of electronic circuits on one small *plate / dish*.

2. I think you should take up *electric / electrical* engineering.

3. Here is how to cut-and-*put/paste* text using a visual selection.

4. School students all over the world are *familiar /similar* in that they have to take exams.

5. Edison *invented / discovered* the carbon microphone used in all telephones.

**Ответы**

I.

1. B. on

2. C. of

3. D. for

4. A. by

5. A. by

6. B. to

7. B. on

8. D. of

9. C. into

10. A. from

II.

1. C move at

2. A for

3. D compulsory

4. A retrieve

5. C charge

6. D curriculum

7. B appliances

8. A alert

9. B hand, hand

10. A on to

III. 1. plate

2. electrical

3. paste

4. similar

5. invented

**Контрольная работа 2 (3 семестр, I раздел)**

**Вариант№2**

I. Выберите ОДИН правильный вариант ответа:

1. TV broadcasting rights are estimated \_\_\_\_ $800 million.

A. in

B. at

C. to

D. with

2. The majority of population was in favor \_\_\_\_ hosting the event.

A. of

B. with

C. for

D. to

3. The team hadn’t played together \_\_\_\_ very long.

A. in

B. for

C. since

D. out

4. Even \_\_\_\_\_\_ the event was broadcast on television, ten percent of the population was unaware it was taking place.

A. although

B. thus

C. never

D. though

5. Sergey’s parents were unaware \_\_\_\_ his bad grades.

A. about

B. with

C. of

D. over

6. The multinational company agreed to sponsor the event \_\_\_\_ providing equipment for the teams.

A. with

B. by

C. of

D. from

7. The injured player walked \_\_\_\_\_ the pitch.

A. out

B. away

C. through

D. off

8. The charity is looking \_\_\_\_\_ people to do voluntary work.

A. after

B. for

C. at

D. of

9. The ground was too hard to camp \_\_\_\_\_.

A. off

B. under

C. on

D. above

10. Italy is \_\_\_\_ second place, having won four times.

A. on

B. with

C. in

D. at

II. Выберите ОДИН правильный вариант ответа:

1. For the sports personality advertising is an easy way to increase their \_\_\_\_\_\_\_\_\_.

A. wellbeing

B. health

C. outcome

D. income

2. \_\_\_\_\_\_\_\_\_\_\_\_ earning money through advertising, the athletes claimed they were underpaid.

A. In spite of

B. However

C. Nevertheless

D. Although

3. Do you think the Olympics should have a \_\_\_\_\_\_ home?

A. infinite

B. permanent

C. indefinite

D. perpetual

4. \_\_\_\_\_\_\_\_ is the first stage of writing an essay.

A. Brainwashing

B. Braindraining

C. Brainstorming

D. Braincollecting

5. The athlete has finally \_\_\_\_\_\_\_ the respect of his team.

A. gained

B. earned

C. bought

D. bargained

6. Many of my peers \_\_\_\_\_\_\_\_\_ the money to fund their studies.

A. have lent

B. have borrowed

C. have credited

D. have mortgaged

7. The winner \_\_\_\_\_\_\_\_\_\_\_ his arm to salute the spectators.

A. has increased

B. has put

C. has raised

D. has risen

8. The funds will be \_\_\_\_\_\_ by inviting people to invest in the company.

A. supported

B. increased

C. gained

D. raised

9. \_\_\_\_\_\_ numbers are numbers that cannot be divided evenly by 2.

A. Odd

B. Even

C. Abnormal

D. Normal

10. The athlete \_\_\_\_\_\_ the world record.

A. stepped over

B. broke

C. hit

D. received

III. Подчеркни наиболее подходящее слово:

1. When they arrived at the airport, they *employed/ rented* a car.

2. Rockley is *hosting/having* the Winter Games next year.

3. The *plan / arrangement* of the city indicates all the major cites of interest.

4. The professor cannot see you tomorrow as he has a very *busy / complete* day.

5. The tickets for the match were very expensive. *Despite / However,* all the tickets were sold within a few hours.

**Ответы**

I.

1. B at

2. A of

3. B for

4. D though

5. C. of

6. B. by

7. D off

8. B for

9. C on

10. C. in

II.

1. D income

2. A in spite of

3. B permanent

4. C Brainstorming

5. A has gained

6. B have borrowed

7. C has raised

8. D raised

9. A Odd

10. B broke

III.

1. rented

2. hosting

3. plan

4. busy

5. However

**3.2.2. Список тем для подготовки презентаций и докладов**

1. «Роль интернета в современном мире».

2. «Нобелевские лауреаты».

3. «Описание экспериментальной установки».

4. Презентация по теме научной деятельности магистранта ( по выбору)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Контролируемые элементы речевой деятельности | Отлично  (зачтено) | Хорошо  (зачтено) | Удовлетворительно  (зачтено) | Неудовлетворительно (не  зачтено) | оценка |
| 1.Степень раскрытия темы | Полное раскрытие обсуждаемой темы.  Всесторонний анализ обсуждаемой проблемы.  Аргументированные взвешенные выводы. | Почти полное раскрытие темы.  Несущественные погрешности при анализе обсуждаемой проблемы.  Несущественные погрешности в представленных выводах. | Неполное раскрытие темы выступления. Не достаточно тщательно проанализированная проблематика. Отсутствие или невнятное представление выводов. | Полная неподготовленность к участию в презентации. Отсутствие анализа проблемы в целом. Отсутствие выводов. |  |
| 2.Уровень представления материала | Систематизированное представление информации , подробное и аргументированное повествование. . Использование не менее 5 источников информации. | Систематизированное, последовательное, логичное представление материала. Использование не менее 2 источников информации. | Представленная информация не полностью систематизирована .Материал представлен непоследовательно и нелогично. Не использованы дополнительные источники информации. | Представленная информация не систематизирована. Материал представлен непоследовательно и нелогично. Не использованы дополнительные источники информации. |  |
| 3.Уровень владения лексико-грамматическими понятиями | Демонстрация сформированности всех необходимых ЗУНов. | Демонстрация сформированности всех необходимых ЗУНов.Не более 3 ошибок при выступлении . | Демонстрация только базовых знаний, умений, навыков. Более 10 ошибок при выступлении . | Полное отсутствие знаний, умений, навыков представления информации на английском языке.  Значительное число ошибок при выступлении. |  |
| 4.Творческий подход к решению обсуждаемой проблемы | Демонстрация сформированности навыков составления и представления англоязычных презентаций, относящихся к профессиональной деятельности  Демонстрация сформированности навыков поиска и обработки информации о достижениях в области российской и зарубежной науки и техники. | Демонстрация сформированности навыков составления и представления англоязычных презентаций, относящихся к профессиональной деятельности. Незначительные погрешности в представлении материала. | Отсутствие навыков составления и представления англоязычных презентаций, относящихся к профессиональной деятельности. Значительные погрешности в представлении материала. | Отсутствие навыков составления и представления англоязычных презентаций, относящихся к профессиональной деятельности. Грубые ошибки в представлении материала. |  |
| 4.Ответы на вопросы | Полноценные исчерпывающие ответы на вопросы аудитории и преподавателя. | Полные или частично полные ответы на вопросы аудитории и преподавателя. | Даны ответы только на элементарные вопросы. | Демонстрация неспособности понимать на слух и  составлять ответы на вопросы аудитории и преподавателя. |  |
| 5.Оформление презентации | Отсутствие лексико-грамматических ошибок в представляемой информации на слайдах. Широкое использование ИКТ. | Не более 3 лексико-грамматических ошибок в представляемой информации на слайдах. Широкое использование ИКТ. | Значительное число лексико-грамматических ошибок в представляемой информации на слайдах. | Небрежное и безграмотное оформление презентации.  Значительное число лексико-грамматических ошибок в представляемой информации на слайдах. |  |
| Итоговая оценка |  |  |  |  | 100 |

**3.2.3. Перечень тем для проведения дискуссии, полемики, диспута, дебатов.**

1. Машины никогда не смогут « мыслить» как люди.

2. Лига плюща.

3. Инновации 21 века.

4. Чудеса современной науки.

**Дискуссия** — обсуждение спорного вопроса в коллективном собрании, беседе, споре. Дискуссия заключается в коллективном обсуждении какого-либо вопроса, проблемы или сопоставлении мнений, предложений. Цель дискуссии - обучение, тренинг, стимулирование творчества.

Определяется следующее:

* тема и цель «Дебатов»;
* формирование и подготовка команд;
* форма анализа и оценки «дебатов».

При подборе темы необходимо учитывать интерес проблемы, предоставлять одинаковые возможности командам в аргументировании.

**1. Подготовка.** Проведение дискуссии решает две учебные цели: познавательную и коммуникативную. Определяется тема дискуссии. Во время дискуссии магистранты могут как дополнять друг друга (диалог), так и противостоять друг другу (спор). Как спор, так и диалог играют большую роль в сопоставлении различных мнений по одному вопросу.

Для организации дискуссии необходимо:

* заранее подготовить вопросы для поддержания дискуссии;
* не выходить за рамки обсуждаемой проблемы;
* обеспечить вовлечение всех участников в дискуссию;
* не оставлять без внимания ни одного неверного суждения, своевременно организуя их критическую оценку;
* не торопиться самому отвечать на вопросы дискуссии, а переадресовывать их аудитории;
* следить за тем, чтобы объектом критики являлось мнение, а не участник, выразивший его;
* сравнивать разные точки зрения, вовлекая участников в коллективный анализ и обсуждение.

Эффективность проведения дискуссии зависит от:

* подготовки магистранта по предложенной проблеме;
* семантического однообразия (все термины должны быть понятны всем участникам);
* корректности поведения участников;
* умения преподавателя проводить дискуссию.

**2. Вступление.** Преподаватель должен:

* сформулировать задачи и цели дискуссии;
* провести знакомство участников (если группа в таком составе собирается впервые);
* создать необходимую мотивацию, т.е. изложить проблему, показать ее значимость, выявить в ней нерешенные и противоречивые вопросы, определить ожидаемый результат (решение);
* установить регламент выступлений;
* сформулировать правила ведения дискуссии (выступить должен каждый);
* создать доброжелательную атмосферу;
* добиться однозначного понимания терминов.

**3. Основная часть.** Предполагает ситуацию сопоставления, иногда конфликта идей.

Задачи:

* начать обмен мнениями (предоставление слова самим участникам);
* собрать максимум мнений, предложений (активизировать работу каждого магистранта);
* не уходить от темы;
* поддерживать высокий уровень активности всех участников;
* оперативно проводить анализ высказанных идей, мнений, позиций, предложений перед тем, как переходить к следующему этапу дискуссии.

**4. Выводы .** На заключительной стадии предполагается выработка определенных единых мнений и решений. Задачи:

* проанализировать и оценить проведенную дискуссию, подвести итоги, результаты;
* помочь участникам дискуссии прийти к единому мнению;
* принять групповое решение совместно с участниками (учитывая разнообразные позиции каждого);
* в заключительном слове прийти к конструктивным выводам, имеющим познавательное и практическое значение;
* добиться чувства удовлетворения у большинства участников, поблагодарить всех за активную работу.

**Дебаты** - свободное высказывание, обмен мнениями по предложенному участниками тематическому тезису (приводятся примеры, факты, аргументы, которые логично доказываются, поясняются; не допускаются личностные оценки и эмоциональные проявления).

Отличие дебатов от дискуссии: эта форма «круглого стола» посвящена однозначному ответу на поставленный вопрос – да или нет. Одна группа (утверждающие) - сторонники положительного ответа, а другая группа (отрицающие) – сторонники отрицательного ответа. Внутри каждой из групп образовываются 2 подгруппы, одна из которых подбирает аргументы, а другая разрабатывает контраргументы.

Дебаты формируют: умение отстаивать свою позицию, ораторское мастерство, умение вести диалог, командный дух и лидерские качества. В дебатах принимают участие две команды: одна утверждает тезис, а другая его отрицает. Команды состоят из двух или трех игроков (спикеров). Суть игры заключается в том, чтобы убедить нейтральную третью сторону, судей, в том, что ваши аргументы лучше (убедительнее), чем аргументы вашего оппонента.

Каждый этап дебатов имеет собственную структуру.

1. **Подготовка занятия.**
2. **Вступление.**

Каждая команда (в составе трех спикеров) имеет возможность брать тайм-ауты между любыми раундами общей продолжительностью 3-5 минут.

Роли спикеров (У1 — первый спикер команды утверждения; О1 — первый спикер команды отрицания и т. д. )

Спикер У1:

* представление команды;
* формулировка темы, актуальность;
* определение ключевых понятий, входящих в тему;
* выдвижение критерия (ценность или цель команды);
* представление кейса утверждающей стороны;

Спикер О1:

* представление команды;
* формулировка тезиса отрицания;
* принятие определений ключевых понятий;
* атака или принятие критерия оппонентов;
* опровержение позиции утверждения;
* представление кейса отрицающей стороны.

Специально выбранные судьи или нейтральная аудитория оценивают выступления команд по выбранным критериям и объявляют победителя.

**3. Основная часть.**

Форма дебатов

Во время дебатов каждый спикер выполняет строго определенные роли и функции.

За временем дебатов следит «тайм-кипер», за 0,5 минуты предупреждающий команды и судей об окончании времени выступления.

**4. Выводы .**

После завершения дебатов происходит рефлексивный разбор деятельности всех участников. Анализируется подготовка команд к «дебатам», их способы выдвижения аргументов и ответов на вопросы оппонентов.

Дискуссия, дебаты помогают развивать самостоятельность мысли магистрантов, учиться выделить главное в учебном материале, развивать речь и умение общаться, спорить.

Использование активных методов в вузовском обучении является необходимым условием для подготовки высококвалифицированных специалистов и совершенствования знаний, умений и навыков магистрантов, вовлекая их в активную учебно-познавательную деятельность.

Критерии оценки:

- оценка «зачтено» выставляется: если магистрант, глубоко изучил материал по теме, провел анализ информации, подобрал примеры и подготовил вопросы для оппонентов; был активен на протяжении всей дискуссии; его высказывания были логически связными, аргументация убедительной, а возражения уместными и обоснованными. Наряду с этим, магистрант продемонстрировал хорошие коммуникативные и речевые навыки: использовал соответствующий ситуации стиль, богатую лексику, правильную грамматику, средства логической связи; не допускал грубых лексических и грамматических ошибок, затрудняющих восприятие речи.

- оценка «не зачтено» выставляется, если: магистрант не изучил материал по теме «круглого стола» и был не в состоянии принять участие в дискуссии; его речевые умения и навыки были настолько слабыми, что не позволили ему высказывать свои мысли и приводить аргументы и возражения.

* + 1. **Перечень дискуссионных тем для проведения «круглого стола».**

Использование активных методов в вузовском обучении является необходимым условием для подготовки высококвалифицированных специалистов и совершенствования знаний, умений и навыков магистрантов, вовлекая их в активную учебно-познавательную деятельность, одним из видов которой является «круглый стол»,

Участие магистрантов в таком виде деятельности, как «круглый стол» в его различных видах, в частности, в форме дебатов или дискуссии, учит их реализовывать свой творческий потенциал, формулировать независимые суждения, а также способствует развитию у них критического мышления. Наряду с этим, за счет совершенствования речевых навыков магистрантов, развития умение вести полемику и выступать перед аудиторией с развернутым сообщением, данный вид учебной деятельности вносит весомый вклад в формирование коммуникативной компетенции магистрантов. Все эти умения и навыки позволят будущим ученым в дальнейшем осуществлять успешную научную деятельность.

Тема 1. **Science in the 20th century**

«Круглый стол» по данной теме проводится в форме дебатов. Преподаватель заранее знакомит учащихся с темой предстоящего обсуждения и объясняет магистрантам цели, специфику и регламент предстоящей игры. Чтобы подчеркнуть полемический характер данной темы, преподаватель предлагает магистрантам небольшой текст, иллюстрирующий ее проблемные аспекты. Учащиеся сами определяют, какие из открытий и изобретений они хотят обсуждать. Затем группа делится на три команды. Одна из них – оптимисты - должны доказать выдающееся значение открытий и достижений науки 20 века, другая – пессимисты - доказать, что величайшие открытия и изобретения 20 века принесли человечеству больше вреда, чем пользы. В каждой из этих команд должен быть две подгруппы. Первая подгруппа готовит аргументы, вторая подбирает контраргументы. Третья группа учащихся – судьи. Им предстоит оценить аргументы и контраргументы двух команд и определить победителя. Готовясь к «круглому столу», учащиеся самостоятельно анализируют информацию по теме, подбирают примеры, готовят аргументы и контраргументы.

В ходе дебатов каждая из команд представляет свою точку зрения, доказывает обоснованность своих выводов и оппонирует соперникам. Преподаватель следит за ходом дискуссии, предоставляя командам равные возможности для аргументации, и следит за регламентом «круглого стола».

По окончании дебатов судьи подводят итог на основании записей, которые они делают в ходе «круглого стола» и определяют победителей. Судьи анализируют степень подготовки магистрантов по теме, убедительность их собственной аргументации и контраргументов.

Тема 2. **Science at the turn of centuries**

«Круглый стол» по данной теме проводится в форме дискуссии.

Преподаватель формулирует проблему и предлагает магистрантам ознакомиться с небольшим текстом по данной тематике. Один из учащихся назначается ведущим «Круглого стола». На эту роль выбирается активный и пользующийся авторитетом в группе магистрант, обладающий хорошими коммуникативными навыками. Затем назначаются докладчики, готовящие сообщения (3-5 мин) по темам:

а) состояние науки на рубеже 19-20 веков;

б) состояние науки на рубеже 20-21 веков.

Остальным участникам группы предлагается самостоятельно изучить и проанализировать материал (на базе ресурса Интернет, печатных источников, и пр.), подобрать примеры и подготовить 3 вопроса проблемного характера по теме круглого стола. До сведения магистрантов доводится информация о том, что работа каждого из них будет оцениваться индивидуально по результатам дискуссии.

«Круглый стол» начинается с формулировки темы дискуссии и представления участников (каждый из магистрантов придумывает для себя «легенду» и заранее знакомит с ней ведущего). Затем докладчики представляют свои сообщения, а остальные члены группы задают им вопросы. Таким образом, «круглый стол» переходит в стадию дискуссии. Преподаватель берет на себя роль одного из членов группы и следит за поддержанием должной атмосферы полемики (с помощью соответствующих вопросов, выявления внутренних противоречий, акцентирования значимости отдельных элементов дискуссии), таким образом мотивируя учащихся на творческое осмысление темы и стимулируя развитие их коммуникативных навыков).

На последнем этапе магистранты суммируют результаты дискуссии, подводят итог и делятся своими впечатлениями.

Тема 3. **Career choice: science or business**

«Круглый стол» по данной теме проводится в форме свободной дискуссии. Так как данная тема имеет непосредственное отношение к жизни магистрантов, нет нужды в предварительной мотивации магистрантов на участие в ее обсуждении. Учащиеся самостоятельно определяют свою принадлежность к группе защитников выбора в пользу практической или научной деятельности. В каждой из команд должны быть две подгруппы. Первая подгруппа готовит аргументы, вторая подбирает контраргументы. Готовясь к «круглому столу», учащиеся самостоятельно анализируют информацию по теме, подбирают примеры, готовят аргументы, контраргументы и проблемные вопросы друг другу.

В ходе дискуссии один из магистрантов выполняет обязанности ведущего. Он формулирует тему «круглого стола», представляет его участников и дает слово докладчикам сторон, которые на примере деятельности одного из успешных ученых/бизнесменов показывают привлекательность каждой из карьер. Затем в игру вступают «атакующие» члены команд и «разрушители», которые должны перевести обсуждение темы в форму дискуссии.

В заключение ведущий подводит итог дискуссии, благодарит участников и выражает уверенность в их успешной дальнейшей деятельности.

**Критерии оценки:**

- оценка «отлично» выставляется: если магистрант, глубоко изучил материал по теме «круглого стола», провел анализ информации, подобрал примеры и подготовил вопросы для оппонентов; был активен на протяжении всей дискуссии; его высказывания были логически связными, аргументация убедительной, а возражения уместными и обоснованными. Наряду с этим, магистрант продемонстрировал хорошие коммуникативные и речевые навыки: использовал соответствующий ситуации стиль, богатую лексику, правильную грамматику, средства логической связи; не допускал грубых лексических и грамматических ошибок, затрудняющих восприятие речи.

- оценка «хорошо» выставляется: если магистрант изучил материал по теме «круглого стола», провел анализ информации, подобрал примеры и подготовил вопросы для оппонентов; был активен на протяжении всей дискуссии, но его речевые возможности не всегда позволяли ему правильно и убедительно высказывать свои мысли и приводить аргументы и возражения. При этом магистрант продемонстрировал хорошие коммуникативные и речевые навыки: использовал соответствующую теме лексику и достаточно правильную грамматику, но допускал лексические и грамматические ошибки, в некоторых случаях затруднявшие восприятие его речи.

- оценка «удовлетворительно» выставляется, если: магистрант не достаточно глубоко изучил материал по теме «круглого стола» и был малоактивен; слабое владение речевыми умениями и навыками не позволили ему правильно и убедительно высказывать свои мысли и приводить аргументы и возражения; магистрант продемонстрировал определенные коммуникативные и речевые навыки, позволявшие ему принимать некоторое участие в дискуссии, хотя лексика учащегося была бедной, а грамматика нередко неправильной, что затрудняло восприятие его речи.

- оценка «неудовлетворительно» выставляется, если: магистрант не изучил материал по теме «круглого стола» и был не в состоянии принять участие в дискуссии; его речевые умения и навыки были настолько слабыми, что не позволили ему высказывать свои мысли и приводить аргументы и возражения.

* + 1. **Темы групповых и/или индивидуальных творческих**

**заданий/проектов.**

Работа над выполнением творческого задания (проекта) это внеаудиторная самостоятельная комплексная деятельность магистрантов с целью создания коллективного/индивидуального творческого продукта.

Цель проекта на занятии по иностранному языку – совершенствовать навыки изложения мыслей в рамках заданной темы, совершенствовать грамматические навыки, расширять потенциальный словарь и стимулировать дальнейшее развитие навыков монологической и диалогической речи в условиях ,приближенных к реальным ситуациям профессионального общения.

**Групповые творческие задания (проекты):**

1. Airplanes and security

2. Anti-drugs Campaign

3. Biological Weapons

4. Bird Flu

5. Toxicomania

6. Cloning

7. Cold War

8. Ecological Problems

9. Environmental Protection

10. Human Evolution

11. Nuclear Weapons

12. Overpopulation

13. Problems of Youth

14. The History of Nuclear Bomb Creation

15. Water Pollution

**Индивидуальные творческие задания (проекты):**

1. Письмо в прошлое - себе самому 20 лет назад

Представьте, что существует такая машина времени, которая сможет отправить в прошлое Ваше письмо самому себе, когда Вы были на 20 лет младше (если Вы ещё молоды, то на 10 лет младше). Напишите советы, воодушевляющее напутствие или открытия, которыми Вы можете поделиться с самим собой.

1. Рецензия на фильм

Вспомните фильм, который произвёл на Вас неизгладимое впечатление. Напишите рецензию о сюжете, постановке, игре актёров и своих эмоциях. Опубликуйте её как комментарий на страничке фильма на сайте Imdb.

1. Рецепт

Поделитесь с другими своим излюбленным рецептом. После того, как Вы его напишете, опубликуйте на каком-нибудь кулинарном форуме или комьюнити.

1. Психологический опросник

Представьте, что Вам необходимо организовать опрос об интересном психологическом явлении. Темы могут разниться от будничных вопросов до самореализации, например,: довольство работой, счастье в личной жизни, позитивное мировоззрение, отношения, выбор профессии. Придумайте от 10 до 25 вопросов. Вы можете использовать вопросы с заданными вариантами ответа или открытые вопросы.

1. Биография

Напишите биографию человека, которым Вы восхищаетесь. Если никто известный не приходит в голову, напишите о друге, родственнике или знакомом.

1. Рассказ-приключение

Напишите рассказ о группе людей, которые случайно оказались в джунглях или пустыне. Вы можете включить реалистичные элементы, а можете дать волю воображению.

1. Советы эксперта

Представите, что Вы ведёте колонку в газете, отвечая на вопросы читателей о том, как поступить в разных сложных случаях. Ваши советы потом публикуют в специальном разделе. Вспомните родственника или друга, у которого проблемы, и напишите 1) письмо в газету от имени этого человека и 2) советы эксперта.

1. День из жизни

Найдите в Интернете фотографию, на которой изображён необычный человек. Придумайте, как выглядит его повседневная жизнь и опишите один день из его жизни. Чем более экзотическое фото Вы выберете, тем лучше для развития воображения и навыков письменного английского.

1. Детское воспоминание

Опишите запомнившееся Вам событие из детства. Постарайтесь вспомнить как можно больше подробностей, а потом составьте из них захватывающую историю.

1. Советы путешественникам

Вспомните интересную достопримечательность, экскурсию или место, которое Вы посетили за рубежом. Напишите свой отзыв, а затем постарайтесь найти это место на сайте Tripadvisor и опубликуйте там свой отзыв.

Критерии оценки:

- оценка «отлично» (5 баллов) выставляется магистранту/группе магистрантов, если работа выполнена на высоком профессиональном уровне. Представленный материал фактически верен, допускаются лишь негрубые фактические неточности. Демонстрируется умение свободно отвечать на вопросы, связанные с проектом. Материал излагается грамотно, логично и интересно .Стиль изложения соответствует задачам проекта. Чувствуется творческий подход к обсуждаемой проблеме, способность к выполнению сложных задач, навыки работы в команде, организационные способности;

- оценка«хорошо»(4 балла)выставляется магистранту/группе магистрантов, если работа выполнена на достаточно высоком профессиональном уровне. Допущено до 4–5 ошибок. Демонстрируется умение отвечать на вопросы, связанные с проектом, но ответы недостаточно полные. Допускаются отдельные лексико-грамматические ошибки, логические и стилистические погрешности. Текст недостаточно логически выстроен или обнаруживает недостаточное владение риторическими навыками. Поставленная задача выполнена в целом, но без инициативы и творческих находок;

- оценка «удовлетворительно»(3 балла) выставляется магистранту/группе магистрантов, если уровень выполненной работы недостаточно высок. Допущено больше 10 лексико-грамматических ошибок . Ответы даны только на некоторые из заданных вопросов , связанных с темой проекта. Работа написана несоответствующим стилем, недостаточно полно изложен материал, допущены различные речевые, стилистические, логические ошибки;

- оценка «неудовлетворительно»(2) выставляется магистранту/группе магистрантов, если работа выполнена на низком уровне. Допущено более 15 лексико-грамматических ошибок . Ответы на связанные с проектом вопросы обнаруживают непонимание предмета и отсутствие ориентации в материале проекта. Допущены грубые орфографические, пунктуационные, речевые ошибки; неясность и примитивизм изложения делают текст трудным для восприятия. Задача не выполнена полностью или выполнены лишь отдельные несущественные детали.

**3.2.6. Темы для написания эссе.**

Эссе – это сравнительно небольшая по объему самостоятельная письменная работа на тему, предложенную преподавателем.

Цель эссе - развить у магистранта навыки самостоятельного творческого мышления и письменного изложения собственных умозаключений. Эссе должно содержать четкое изложение сути поставленной проблемы, включать самостоятельно проведенный анализ этой проблемы с использованием концепций и аналитического инструментария соответствующей дисциплины, выводы, обобщающие авторскую позицию по поставленной проблеме. Виды эссе могут значительно варьироваться и принимать различные формы.

Тема 1. «Университетское образование в Великобритании и России. Различия и сходство».

Воспитательная цель: расширение межкультурного кругозора магистрантов.

Учебная цель: активизации навыков употребления различных лексико-грамматических структур, используемых для сравнения.

Магистрантам предлагается написать эссе (250 символов) на сопоставление систем обучения в университетах Великобритании и России. Задание предваряется презентацией преподавателя, посвященной особенностям обучения студентов в университетах Oxbridge и практической работой по активизации лексико-грамматических структур, используемых для сравнения и противопоставления различных событий, явлений и понятий. В ходе презентации магистранты делают краткие записи, которые в дальнейшем используются для написания эссе.

В своей работе магистранты должны отразить все аспекты предложенной темы в логичной и последовательной форме с соблюдением правильной организационной структуры текста. При этом магистранты должны продемонстрировать знание соответствующей поставленной коммуникативной задаче грамматики и лексики. При написании эссе магистрантам следует уделить особое внимание правильному употреблению различных лексико-грамматических структур, используемых для сравнения.

Тема 2. «Инновации 20 века»

Воспитательная цель: расширение общего и научного кругозора магистрантов.

Учебная цель: развитие навыков построения текста и употребления лексических элементов, позволяющих обеспечивать логическую связь в повествовании.

Магистрантам предлагается написать эссе, в котором освещаются новейшие перспективные научные разработки и исследования. Для этого им необходимо, используя ресурс Интернет, провести поиск соответствующего данной теме материала, проанализировать его и обобщить в форме связного письменного речевого произведения в объеме 250 символов. При этом перед магистрантами ставится дополнительная задача: продемонстрировать уверенное владение изученным грамматическим материалом (Perfect Tenses) и грамотно использовать соответствующую данной теме лексику. Наряду с этим, магистрантам следует убедительно аргументировать свои представления и выводы, правильно и последовательно структурировать текст, представить следующее из логики повествования заключение.

Тема 3. «Описание процесса»

Воспитательная цель: подготовка учащихся к самостоятельной научной деятельности.

Учебная цель: активизация навыков использования страдательного залога и различных форм причастия и инфинитива.

От магистрантов требуется описать один из процессов, который они используют в своей научной работе. В тексте должны в последовательной и логичной форме указываться этапы работы, инструментарий, задачи исследования, его результаты и значение. Перед учащимися ставится задача использовать в своих работах:

а) страдательный залог в различных временных формах;

б) разнообразные формы причастия и инфинитива;

в) соответствующую их направлению специализации научную терминологию.

Тема 4. «Планы дальнейшей научной деятельности»

Воспитательная цель: формирование умения планировать свою научную деятельность.

Учебная цель: использование различных структур для обозначения событий в будущем.

В данном эссе магистранты должны рассказать о своих научных интересах и предпочтениях, а также о путях реализации данных планов. Им следует обосновать свой выбор, описать привлекательные аспекты работы в науке и возможные трудности, связанные с исследовательской деятельностью. Молодые ученые должны поделиться уже достигнутыми научными результатами и рассказать о том, какой вклад они в дальнейшем могут внести в развитие отечественной науки. Данная тема предполагает широкое использование различных структур для выражения будущих действий, событий и пр.

Тема 5. «Международные научные контакты»

Воспитательная цель: формирование умения коммуникации в межкультурной научной среде.

Учебная цель: активизация навыков использования различных временных форм.

Магистрантам предлагается написать эссе, посвященное теме межкультурной научной коммуникации. От учащихся требуется рассказать о разнообразных формах международных контактов ученых: публикации статей в международных журналах, совместных научных проектах, участии в различных международных семинарах и конференциях, и пр. Раскрывая данную тему, магистранты могут не только использовать данные из различных источников, но и рассказать о собственной международной научной деятельности. При написании данного эссе магистрантам следует уделить особое внимание правильному употреблению различных временных форм и лексических элементов, обеспечивающих логическую связь повествования.

Тема 6. «Тезисы научного доклада»

Воспитательная цель: подготовка магистрантов к самостоятельной научной деятельности.

Учебная цель: закрепление навыков построения текста и употребления лексических элементов, позволяющих обеспечивать логическую связь в повествовании.

Учащиеся должны представить тезисы научного доклада для ежегодной «Международной Молодежной Школы-Конференции» по теме своей научной работы. Магистранты готовят краткое обоснование осуществляемого ими исследования, описывают цели экспериментов, ход исследований и полученные результаты. Им следует продемонстрировать уверенное владение словарным запасом, необходимым для успешной научной деятельности, хорошее знание терминологии по направлению их специализации, а также использовать правильную грамматику и общую лексику. Особое внимание необходимо уделить организации структуры текста, четкости и лаконичности изложения сути, связности и логичности повествования.

**Критерии оценки:**

- оценка «отлично» выставляется магистранту, если: тема эссе полностью раскрыта, содержание отражает все аспекты задания, учащийся умело аргументирует свои положения и выводы, соблюдает соответствующий теме стиль и структуру текста, использует средства логической связи, богатую лексику, правильную грамматику и орфографию. Допускаются 2-3 негрубые ошибки;

- оценка «хорошо» выставляется магистранту, если: содержание раскрыто полностью, но при этом отображены не все аспекты задания; учащийся не всегда аргументирует свои идеи; в некоторых случаях, за счет неверного использования речевых элементов, нарушает логику повествования; допускает некоторые лексические, грамматические и орфографические ошибки (4-5);

- оценка «удовлетворительно» выставляется магистранту, если: тема эссе раскрыта не до конца; задания выполнены не полностью или с ошибками; отсутствует аргументация или она является неубедительной; не соблюдена структура абзацев и текста в целом; допущены грубые лексические, грамматические и орфографические ошибки (6-8);

- оценка «неудовлетворительно» выставляется магистранту, если: не представлена самостоятельная творческая работа, а также, если тема эссе не раскрыта или не соответствует заданию, отсутствует аргументация, нарушена структура текста, отсутствует логика в высказываниях, допущено большое количество (10 и более) грубых лексических, грамматических и орфографических ошибок.

**3.3. Контрольные оценочные средства (КОС) промежуточной аттестации и критерии оценивания.**

**3.3.1. Комплект контрольных работ.**

**Промежуточные** тестовые работы позволяют судить об успешности овладения магистрантами разделом программного материала. Промежуточные тестовые работы проводятся по завершении изучения каждого раздела учебной программы и позволяют установить уровень владения иностранным языком, достигнутый в результате усвоения значительного по объему материала. Объективность контроля обеспечивается за счёт количественной и качественной оценки результатов речевой деятельности магистрантов. Проведение промежуточных тестовых работ носит систематический характер и обеспечивает регулярный контроль усвоения полученных знаний и развития навыков в различных видах речевой деятельности.

Критерии оценки:

- оценка «отлично» выставляется студенту, если он набрал 47-50 баллов;

- оценка «хорошо» выставляется студенту, если он набрал 38-46 баллов;

- оценка «удовлетворительно» выставляется студенту, если он набрал 30-37 баллов;

- оценка «неудовлетворительно» выставляется студенту, если он набрал меньше 30 баллов.

**Контрольная работа 3 (2 семестр II раздел)**

**Part I**

**Translate the sentences into Russian.**

1. Our new software project is funded by the state.

2. This very vaccine is injected into the arm or leg.

3. Dehydration is common in older people if the weather is very hot, and those suffering from diabetes.

4. On the one hand, addiction feels so good that you want to use more. On the other hand, addiction leads to negative consequences.

5. If you want to buy a vacuum cleaner, go to a store for home appliances.

6. By law in the UK, all children between 5 and 16 must receive a full-time education.

7. Yellow paint reflects green and red light but absorbs blue light, whereas cyan (голубой) paint reflects blue and green light and absorbs red light.

8. Academic style is relatively formal. In general this means that in an essay you should avoid colloquial words and expressions.

9. When you set your study targets, allow regular revision time.

10. The survey was conducted by an external agency on behalf of Ministry of Education and Science of the Russian Federation. (максимальное количество баллов-10)

**Part II**

**Finish up the sentences of contrast and comparison.**

11. The education system in the USA and Canada are similar, whereas…

12. In Quebec, the French language is a subject in French-speaking schools. In the same way, …

13. Russian schools have three terms a year. In contrast, …

14. Although there are a number of significant differences between the systems, both…

15. You will be given a list of books which you need to read for you course, as well as… (максимальное количество баллов-5)

**Part III.**

**Write paragraphs referring to the topic sentences given below:**

16. Malnutrition is a big problem in Africa.

17. There is some evidence that a low-carbohydrate diet may help people lose weight.

18. Maintaining a healthy weight is important for health.

19. Getting regular physical activity is one of the best things you can do for your health.

20. Scientists have recently proved…

(максимальное количество баллов -10)

**Part IV**

**Translate the passage**

The core principle of the new urban design is to make the river the heart of the downtown area. Main street will run over Queen’s Bridge, connecting the two halves of the town separated by the river. This street will be capped on each end by two major town parks, drawing pedestrian traffic from either side of town. The bridge itself will be expanded to include large promenades on each side of the traffic lanes, creating a place for events or sight-seeing.

Pedestrians will also be able to take advantage of stairs and ramps connecting directly to new park spaces along the riverfront. Extensive landscaping and the addition of bike paths in this area will centralize the river, making it the go-to destination for visitors and residents alike. The proposal also allows for more intense development on the properties closest to the river, allowing architects and contractors to build higher buildings to take advantage of the view.

Smaller public areas will also be fitted into the existing town structure. A new town square will be created in front of the local movie theater, while the nearby parking lot will be transformed into a “transitional shared zone,” being used for outdoor gatherings when necessary. Sidewalks along main streets will be widened, while some of the parking spaces will be taken up by tree plantings. (максимальное количество баллов -25)

Общее количество баллов за итоговую контрольную работу -50

**3.3.2. Вопросы к экзамену/зачёту по дисциплине «Технический английский»**

Знания, умения, навыки студента на экзамене/зачёте оцениваются оценками:

«отлично», «хорошо», «удовлетворительно», «неудовлетворительно».

Знания, умения, навыки студента на зачёте оцениваются оценками:

«зачтено», «не зачтено» с выставлением «отлично», «хорошо», «удовлетворительно», «неудовлетворительно».

Основой для определения оценки служит уровень усвоения студентами материала, предусмотренного данной рабочей программой по дисциплине.

**Практическая часть**

1. Speak on your research work.

2. What do you know about the most famous British universities?

3. Would you like to change anything in our educational system in general and

in our University in particular?

4. What do you think about the role of science in the modern society?

5. Describe the laboratory you work in, its equipment and the people who work there.

6. What sciences are going to play the most important role in future? Explain why.

7. Speak about our University and its history.

8. Speak about the University or Institute you graduated from.

9. Speak about your plans for the future.

10. Do you think that the human civilization is unique in the Universe?

11. Speak about some scientific facts .

12. Speak about some hypothetical ideas/facts/situations in the field of science.

13. Speak on the subject of your specialization.

**Теоретико-грамматическая часть.**

1.Word Order

2.Passive Voice & Active Voice.

3. Narrative Tenses.

4. Complex Subject

5. Complex Object

6. Modal verbs.

7. Subjunctive Mood.

8. Real and Unreal Conditionals

9. Comparing and Contrasting

10. Collocations: words that go together.

11. Using reference material: using synonyms or more general words to find what you need.

12. Expressing certainty and uncertainty.

13. Indicating reason or result.

14. Recording vocabulary.

15. Understanding visual information.

16.Making notes: different methods of recording what you read.

17. Reporting another person’s opinion.

18. Summarizing: identifying, organizing ,and rewriting ideas.

19. Using a dictionary: words with more than one meaning, pronunciation, or part of speech.

**3.3.3. Зачетный материал для магистрантов.**

Тема 1

I. Translate the sentences.

1. When I proposed this, I didn't claim I had the final theory.

2. The basic technique for such storage was proposed in 1963 by Pietre van Heerden who was working on holographic technologies.

3. While experimenting with the passage of electric current in a tube from which most of the air had been removed, Roentgen made two observations.

II. Translate the paragraph

When Allen and I launched Microsoft, big, expensive mainframe computers ran the back-office operations for major companies, governmental departments and other institutions. Researchers at leading universities and industrial laboratories were creating the basic building blocks that would make the information age possible. Intel had just introduced the 8080 microprocessor, and Atari was selling the popular electronic game Pong. At homegrown computer clubs, enthusiasts struggled to figure out exactly what this new technology was good for…

III. Ask several questions to the sentences with predicates in bold.

a) general questions

b) special questions

c) alternative questions

IV. Напишите три предложения по тематике вашей дипломной работы с придаточным предложением, вводимым союзом when, где два действия происходили в прошлом

а) последовательно,

б) одновременно,

Тема 2

I. Translate the paragraph

Wafer is coated with a substance, called "photo-resist," and then exposed to a black-and-white pattern as if the pattern were being photographed and the coated wafer were the film in the camera. The white areas of the pattern correspond to the upper surfaces of the end regions of all N2 transistors. Light hits the wafer in these white areas of the pattern and chemically alters the photo-resist there. The wafer is dipped in a solvent that dissolves away the chemically altered photo-resist, where the pattern had been white, but not the unaltered parts, where the pattern had been black.

The wafer is then heated in an air-tight oven, filled with a gas of donor impurities. Although the wafer is not heated enough to melt the silicon, it is hot enough for some of the gas atoms to diffuse from the surface into the body of the material. Donor impurities fix themselves into the crystal structure, but only under the open places in the photo-resist. The wafer is cooled and removed from the oven. The emitter and collector regions of N separate transistors have been embedded in the wafer.

II. Ask several questions to the sentences with predicates in bold.

a) general questions

b) special questions

c) alternative questions

III. Choose the correct variant.

X-rays can use/be used to build up a picture of the inside of the human body. When x-rays pass / are passed through the body, they absorb / are absorbed by some tissues more than by others. For instance, bone absorbs / is absorbed more X-rays than muscle. The information records / is recorded on film or screen so that it can be interpreted.. If photographic film exposes / is exposed to the X-rays, it becomes darker in areas where more X-rays have passed through the body.

IV. Translate the sentences:

1

1. Wrapped by hundreds of majestic rings, Saturn is the most beautiful planet in our solar system. Saturn also boasts dozens of moons, a swirling atmosphere and a huge magnetosphere.

2. The spacecrafts however, were only able to spend a few weeks collecting detailed data on Saturn and its 34 known moons - not enough to fully understand the forces at work in those intriguing rings.

3. Some answers and, no doubt, new questions arise in July 2004 when the first spacecraft specifically designed to explore Saturn and its vicinity will reach its destination after a seven-year journey.

4. Led by NASA and the European Space Agency, the Cassini-Huygens mission to Saturn is an international enterprise that will conduct a four-year study of this fascinating planet.

5. The solid-state nature of transistors also meant they could be mass-produced and miniaturized in ways that vacuum tubes could not, and their reliability meant that larger devices incorporating greater numbers of components would be feasible.

6.However, the first computer of this type to be actually constructed and operated was the Manchester Mark I, designed and built at Manchester University in England in1982.

7. Using today's popular "MIPS" terminology (millions of instructions per second), it would be rated at .00083 MIPS.

8. This "control flow" approach would be replaced by a "data flow" model in which the operations are executed in an order resulting only from the interdependences of the data.

9.The resulting enhancement of capabilities, combined with expanded processing power and storage, allows today’s robots to do things such as vacuum a room or help to defuse a roadside bomb —tasks that would have been impossible for commercially produced machines just a few years ago.

2

1. The 17th century saw an unprecedented explosion of mathematical and scientific ideas across Europe.

2. The price of a megabit of storage has seen a similar decline.

3. .Figure 1 shows the type sig­nature of the instruction and instruction template formats.

4 .One practical method of separation uses a sequence of freezing, thawing and compression.

V. Translate into English.

1.В прошлом месяце меня пригласили на научную конференцию. Меня попросили рассказать о результатах эксперимента.

2.На выставке мне показали новый прибор. Мне объяснили, как он работает.

3.Вчера мне сказали, что я должен написать отчет об исследованиях. Мне дали всю необходимую информацию и попросили закончить работу к концу недели.

4.Мне предложили работу в научно-исследовательском институте. Меня пригласили возглавить группу ученых.

5.Недавно мне дали прочитать статью по оптике. Меня впечатлили достижения коллег.

Тема 3

I. Choose the correct time definition.

1. Physicists have struggled to marry quantum mechanics with gravity (for decades/in the twentieth century).

2. It is also significant to note that all of these improvements were implemented (in 1960/lately).

3. This has not been considered good (for many years/ at that time), because of the implications for program debugging.

4. Some things have been used (for a while| in the 90s) such as solar powered calculators.

5. (Recently/At the end of the 20th century) astronomers have found that for a given redshift, distant supernova explosions look dimmer than expected.

II. Translate the sentences:

A

1. Physicists have struggled to marry quantum mechanics with gravity for decades.

2. What is interesting, and important, is that this issue continued to dominate design decisions for many years.

3. The imposing rings brought fame to this fascinating planet, and puzzled observers for centuries.

4. This has not been considered good form for many years, because of the implications for program debugging and the desire for reentrant code in some situations.

5. Humans have been recording data on surfaces since the era of clay-tablet accounting systems.

6.The trouble is that recent astronomical observations have been producing some very strange results. Over the past decade astronomers have found that for a given redshift, distant supernova explosions look dimmer than expected.

B

1. By the late 1960s, the resolving power of these machines had increased enormously, allowing physicists to reveal another layer of matter's substructure.

2. By the late 1800s, scientists had realized that substances such as oxygen and carbon did in fact have a smallest recognizable constituent, which (taking their cue from Democritus) they christened atoms.

3. By the mid-1980s, a central prediction of this proposed electroweak theory had been confirmed by the accelerator at the European Laboratory for Particle Physics (CERN) in Geneva, Switzerland.

C

1. It was obvious that industry had been instrumental in helping to build large devices, such as the JET tokomak at Abingdon in the UK,

2. Less obvious was how industry itself had benefited from the relationship

3. The scientists screened more than 520.000 genes to compare the genetic variations found among smokers who had successfully given up with genetic variations among smokers who had tried to quit but failed.

4. We found that at least 62 of the genes that we had previously identified as playing roles in dependence to other drugs also contribute to nicotine dependence,

5. In many places it took a long time to overcome the non-rational customary systems of weights and measurements which had been used for centuries.

6. In the first instants of the big bang, after quarks had united in groups of three to form protons and neutrons, collectively called baryons, groups of four protons were then able to fuse together and become helium 4 nuclei.

7. When we first proposed those experiments more than 25 years ago, I had expected that within a decade we would have the answer.

8. After a generation of anticipation, when the physics community heard rumors that the CDMS experiment had detected something, we tuned in to the online announcement as if it were a Beatles reunion concert.

D

1. Within forty minutes of the sun shining on the earth, the sun will have given off as much energy as the entire world population will use in a year.

2. We still believe that the answer will have been found by the end of the century.

3. The new telescope will have been constructed by that time.

1. Write the beginning of a paper (in the Present Perfect), choosing one of the two possible variants:

**We have found a new way to produce this material.**

**or**

**A new way to produce this material has been found.**

а) вы разработали новый метод производства микросхем;

б) вы сконструировали новый прибор;

в) вы открыли /исследовали новое явление;

г) сообщите о новом достижение в конкретной научной области.

Тема 4

1. Translate the sentences:

A

1. Quite often, such unexpected inventions seemed to work.

2. In 1865, James Clerk Maxwell's prediction that light was an electromagnetic wave seemedtobe the final blow to particle models of light.

3. This effect could make galaxies appear to contain more matter than can be seen.

4. There does not appear to be a fundamental obstacle in these worlds to some form of organic life evolving.

5. The calculations that predicted the existence of a planet beyond the orbit of Neptune later proved to be in error.

6. Females tend to be better speakers.

7. Variants of that molecule turn out to be excellent at shielding the most dangerous forms of space radiation.

B

1. One of the genes involved in smoking addictiveness is known to play a role in controlling how people respond to stress.

2. These cathode rays were later shown to be a stream of the tiny particles called electrons.

3. These particles would be present today as remnants of the quark soup phase and are predicted to interact very weakly with atoms

4. An important strong X-ray source called Cygnus X-1 is believed to consist of a visible star which is orbiting a common centre of gravity with an invisible companion.

5. Leonardo da Vinci’s 1495 sketch of a mechanical knight, which could sit up and move its arms and legs, is considered to be the first plan for a humanoid robot.

6. One projected commercial payoff of the space program is supposed to be the development of orbiting manufacturing facilities.

7. This method was declared to be superior to the ion-trap model.

8. The eyes are said to be the key to the sole and therefore the first and the most effective weapon in convincing the audience of your honesty, openness and confidence.

C

1. Agriculture is the sector most likely to be affected by changes in climate of all sectors of society.

2. The program is certain to be very expensive, with a total cost running into hundreds of billions of pounds.

3. Survival of the fittest can describe how many offsprings certain spices are likely to leave under given circumstances.

4, In 1610 Galileo discovered what turned out to be Saturn’s most amazing feature, the rings.

D

1. We might occupy the rare universe where the right conditions happen to have come together to make life possible.

2. Plank seems to have imagined that some deeper explanations of quanta would emerge.

3. The Egyptian cubit is generally recognized to have been the most widespread unit of linear measurement in the ancient world.

4. Despite being a major member of the EU, Great Britain is not part of euro zone, and the question of whether it will join any time appears to have receded for the moment.

5. The quark soup itself is thought to have arisen at an extremely early time — perhaps 10.4 second after the big bang in a burst of cosmic expansion known as inflation.

**E**

1. So far this theory seems to be working.

2. The universe appears to be expanding at an accelerating rate, implying the existence of a strange new form of energy – dark energy.

3. As this material disappears into the black hole it is reckoned to be emitting a stream of X-rays, and these are what astronomers are observing.

4. Now we’ve got nearly instantaneous climatic change within a century, and that instantaneous change seems to be accelerating.

2. Write English equivalents (use the construction discussed).

Известно, что атомы…

Оказывается, электроны…

Считается, что материя…

По-видимому, вселенная…

Тема 5

I. Translate the sentences.

1. I have harnessed the computer and made it do actual, practical work.

2. If this energy is positive, it causes spacetime to expand at an exponentially accelerating rate.

3. The glaciers, particularly in the Himalayas, may disappear and cause some of the major rivers to become much more variable.

4. Himalayas, may disappear and cause some of the major rivers to become much more variable.

5. The key was finding a thickness-substrate combination that caused the film to form with the right mixture of tetragonal- and rhombohedra-shaped crystals.

6. That makes it seem as though men and women have moved closer in body shape.

7. The company is forcing me as a designer to think of this as a relationship between the player and a piece of technology.

8. The lever opened up a valve which let some water flow out.

9. The devices being made are too big to be allowed to roam freely around the human body.

10. One of the most interesting parts of emerging solar technology is a tracking system design, which allows the panels to tilt and follow the sun as it travels across the sky, much as a sunflower does.

11. The access to cheap computing power has permitted scientists to work on many of the hard problems that are fundamental to making robots practical.

12. Today’s supercomputers run hot, thanks to power-hungry microprocessors that enable sophisticated scientific research and complex financial transactions to be performed in the blink of an eye.

13. The machine-learning technology will enable players to do things such as kick a digital soccer ball or swat a handball in their living rooms simply by mimicking the motion.

14. The U.S. government is launching a $50-million effort to enable supercomputer-powered climate models to deliver regional impacts.

15. We abandoned that model because it allowed information to be communicated faster than the speed of light.

16. Man also discovered how to plant crops gathering seed from wild plants, which he knew to be useful.

17. Particle physicists consider the weak force in our universe to be not weak enough.

18. We associate such a meaning with the data, and expect a generic operation to take on a meaning determined by the meaning of its operands.

19. One of the earliest particle theories was described in the Book of Optics (1021) by Alhazen, who held light rays to be streams of minute particles that "lack all sensible qualities except energy.

20. Today few people consider expert systems to be real artificial intelligence.

21. Whatever the control unit "believes" to be an order or to be data is treated as such.

22. What other business do you see in the U.S. economy where you expect a company that has a good business model to spend and to invest a lot of money to use less of their product?

23. Man also discovered how to plant crops gathering seed from wild plants, which he knew to be useful.

24. The suspension of funding may lead some scientists to abandon the effort.

25. As one example, nanotechnology-based manufacturing will enable us to apply computerized techniques to automatically assemble complex products at the molecular level.

26. We expect there to be some impact on ocean current circulation.

3. Translate the sentences into Russian.

Use:

a) The Complex Subject,

b) The Complex Object.

1.

a) Ожидается, что результаты будут вскоре получены. (expect)

b) Ученые ожидают, что результаты будут вскоре получены.

2.

a) Считается, что данные достоверны. (consider)

b) Исследователи считают, что данные достоверны.

3.

a) Есть сомнение в том, что вселенная конечна. (doubt)

b) Некоторые космологи сомневаются в том, что вселенная конечна.

4.

a) Известно, что вселенная расширяется. (know)

b) Нам известно, что вселенная расширяется.

Тема 6

I. Translate the sentences.

1. The winds blowing from the Atlantic can bring plenty of rain to the island.

2. Voice-recognition programs can identify words quite well.

3. Investment will not guarantee that all negative impacts can be overcome, but business as usual will guarantee disastrous consequences for the human race.

4. Although researchers have known for years about bismuth ferrite's piezoelectric properties, it could not be made to produce enough voltage to be considered as a replacement for lead.

5. No one could control the structure of bismuth so that it could perform as well as lead and lead-based compounds as a piezoelectric substance. .

6. In a special purpose machine the computational procedure could be part of the hardware.

7. After learning how neurons work, engineers will be able to design and build analogous devices based on advanced nanoelectronics and nanomachines.

8. With this knowledge, engineers will be able to build fast, capable Al systems, even without understanding the brain and without clever programming.

9. We must be able to predict how climate change will impact regions in the next 10 to 20 years.

10. We may be able to control and manipulate some of our gestures but not all of them.

11.Astronomers have been able to conduct numerous experiments over the years to support Hubble’s notion that the Universe is expanding.

12. Though the programming path to Al seems open, our knowledge does not justify the sort of solid confidence that thoughtful engineers had (decades before Sputnik) in being able to reach the Moon with rockets.

13. With the advent of quantum mechanics we were able to explore the rules that govern particle interactions on the atomic scale and smaller.

14. If the compiler is not able to derive the correct scheduling constraints for a set of interface methods, we show how the user is able to override the compiler through user annotations that carry proof obligations.

15. Postdoctoral associate Gustavo Wiederhecker and his colleagues achieved static displacement—that is, they were able to bend and hold their structure in place rather than causing it to move back and forth.

16. In a general purpose machine the instructions must be as changeable as the numbers they acted upon.

17. This fact must be interpreted in a slightly different way.

18. Caution must be used when interpreting these results.

19. We must be able to predict how climate change will impact regions in the next 10 to 20 years.

20. In fact, lead in electronics is so pervasive that the document had to include a list of exemptions to the metal's ban, most notably in piezoelectric devices.

21. To meet this demand for ubiquitous memory, electronics makers have had to pack in more and more data, even as they shrink the sizes of their gadgets.

22. Four-dimensional space-time would have to emerge from the theory, rather then put into it.

23. Whenever somebody wants to build a new robot, they usually have to start from square one.

24. In the scientific community, where results have to be reviewed and duplicated, bias must be avoided at all costs.

25. Data are not going to replace voice as the fundamental emergency communication, because in environments where you have to use your eyes and hands for other things, you have to be able to talk.

26. In the old days of classical physics, you might have wanted to predict what a billiard ball would do when it ran into another billiard ball or the side of the table.

27. A decade ago, holographic systems promised to revolutionize data storage. The early hype may have evaporated, but the technology quietly progressed, and working devices are now on the market.

28. It executed an instruction in 1.2 milliseconds, which must have seemed phenomenal at the time.

29. In Europe the mobile phone market may have stagnated but across the world it has leapt from obscurity towards ubiquity.

30. We cannot predict particular advances in science and technology. At the end of the nineteenth century, who could have anticipated such discoveries as the theory of relativity or plate tectonics; who could have anticipated quantum mechanics, the implications of Heisenberg's indeterminacy principle, and the work in particle physics carried out by Leon Lederman and others at CERN.

31. These arguments suggest that during inflation the cosmological constant and other parameters could have taken a virtually limitless range of different values.

32. Just two pulses were detected over almost a year, and they might have been caused by dark matter.

33. Such a functional approach began with LISP (1961), but had to be forced into a conventional hardware-software environment. New functional programming architectures maybe developed from the ground up.

34. In theory, under weightless conditions, it should be possible to fabricate ball bearings, grow semiconductor crystals and purify pharmaceuticals without imperfections caused by gravity.

35. Science could no longer be expected to predict with certainty the outcome of experiments.

36. Cosmologists may not actually need to invoke exotic forms of energy. If we live in an emptier-than-average region of space, then the cosmic expansion rate varies with position, which could be mistaken for a variation in time, or acceleration.

37. The glaciers, particularly in the Himalayas, may disappear and cause some of the major rivers to become much more variable, which will have negative effects on yields in south Asia. At the same time, traditional seed varieties and livestock breeds that might provide a genetic resource to adapt to climate change are being lost.

38. If we could document the spontaneous generation of just one complex life-form from inanimate matter, then at least a few creatures seen in the fossil record might have originated this way.

39. The Cryogenic Dark Matter Search (CDMS) experiment, located in the deep Soudan mine in Minnesota, is designed to directly detect new elementary particles that might make up the dark matter known to dominate our galaxy. In early December rumors started circulating that the CDMS experiment might actually have seen a signal.

40. To appreciate the significance of such an event, one needs to recognize that scientists have spent the past 40 years building a magnificent theoretical house of cards that could have toppled with the slightest whiff of inconsistent data.

41. It is an unreal feeling, if you are a theorist like me, to imagine that nature might actually obey the delicate theories and fanciful ideas you develop at your desk late at night on scraps of paper or at a computer screen.

II. Use your imagination to express some bold ideas about future scientific advances.

Use the verbs might, could.

Тема 7

I. Translate the sentences.

1. The first proposal for what would later become the metric system was made by a French clergyman, Gabriel Mouton, around 1670.

2. The goal of Einstein's unified theory was to get a theoretical framework that would show all four forces to be distinct manifestations of a single underlying force and would also establish a rationale for the presence of the particular species of apparently fundamental particles.

3. All our discoveries today are based on the ideas of men who lived before us; and without their groundwork, modern inventions would have been Impossible.

4. By the mid-1980s, a central prediction of this proposed electroweak theory – the existence of certain crucial particles, known as Ws and Zs, that would perform the same force-carrying function in weak interactions that photons do in electromagnetic interactions – had been confirmed .

5. The resulting enhancement of capabilities, combined with expanded processing power and storage, allows today’s robots to do things such as vacuum a room or help to defuse a roadside bomb – tasks that would have been impossible for commercially produced machines just a few years ago.

6. The so-called “expert systems” succeed only within strictly limited areas of competence, but they would have amazed the computer programmers of the early 1950.

7. Babbage's machine was ahead of its time, but in fact it would not have greatly exceeded the speed of a skilled human calculator - but it would have been more reliable and easier to improve.

8. Encryption schemes such as RSA classical computers show relative inability to very large numbers, but for a quantum computer this task would be trivial.

9. If so, theorists have determined that the earliest moments of the fiery big bang could have produced these particles in precisely the abundance to account for dark matter, and their interactions with normal matter would have been weak enough to make them invisible to telescopes today.

10. So after a generation of anticipation, when the physics community heard rumors that the CDMS experiment had detected something, we tuned in to the online announcement as if it were a Beatles reunion concert.

11. The majority of data currently on computer systems is protected on algorithms whose basis is the inability to factor large numbers; quantum computers would render these methods completely ineffective.

12. Einstein's general theory of relativity requires that all forms of energy (should) exert gravity.

13. Queen Elizabeth ordered that the good ship be carefully kept as a relic of Drake’s wonderful voyage.

14. The expectations for the fifth generation systems seem to require that substantially new architectures be evolved, and that both hardware and software be freed from the limitations of the von Neumann architecture [Sharp 1985].

15. In the weakless universe, the usual fusing of protons to form helium would be impossible, because it requires that two of the protons convert into neutrons.

16. Science is systematic rigorous and methodical, requiring that tests be repeated so that results can be verified.

17. Some estimates suggest that this would represent a fairly large environmental release of radioactivity.

18. A deeper understanding of the structure of matter at the atomic level requires that measures be made with even greater precision.

19. Lowel suggested that we put a brunch of particles in the stratosphere.

20. This led early string theorists to propose that string theory be applied not as a theory of hadronic particles, but as a theory of quantum gravity.

21. It was supposed that there be a gravitation predicted by string theory.

II. Translate the sentences. Pay attention to the form of the predicate (the Subjunctive Mood or the Future-in-the past).

1. During the 1980s, many analysts thought industrial robotics would take off.

2. In 2003, Time magazine organized a "Future of Life" conference celebrating the 50th anniversary of Watson and Crick's discovery of the structure of DNA. All the speakers - myself included - were asked what we thought the next 50 years would bring.

3. As children, many of us were assured that we would one day live in a world of technological marvels. Films, television, books and World's Fairs promised that the twilight of the 20th century and the dawn of the 21st would be an era of helpful robot servants, flying jet cars, moon colonies, easy space travel, undersea cities, wrist videophones, paper clothes, disease-free lives and, oh, yes, the 20-hour work week.

4. The resulting enhancement of capabilities, combined with expanded processing power and storage, allows today’s robots to do things such as vacuum a room or help to defuse a roadside bomb – tasks that would have been impossible for commercially produced machines just a few years ago.

5. At that time one of the critics argued that it would be cheaper to invest the money allocated for computer technologies and use the interest to human calculators.

6. Democritus proclaimed that you would come upon what he called atoms, from the Greek for "uncut table."

7. Our universe contains overwhelmingly more matter than antimatter, but a small adjustment to the parameter that controls this asymmetry is enough to ensure that the big bang nucleosynthesis would leave behind a substantial amount of deuterium nuclei.

8. We need not assume that in order to create a mind on a computer it would be sufficient to program it in such a way that it behaves like a human in all situations, including passing the Turing test. 9. When we first proposed those experiments more than 25 years ago, I had expected that within a decade we would have the answer.

10. Any attempt to proscribe such technologies will not only deprive human society of profound benefits, but will drive these technologies underground, which would make the dangers worse.

III. Write 2–3 sentences about some hypothetical ideas/facts/situations in the field of science.

Тема 8

I. Translate into Russian.

1. But when we become able to repair cells, we will be also able to build replicating assemblers and excellent spacecraft.

2. If the reading wave has the same wavelength as a particular reference wave, and is beamed into the block at the same angle, it will pick out the data page stored using that reference wave.

3. If you're having trouble keeping track of all the forces and the particles of matter, you'll welcome the modern reformulation of Einstein's goal of a unified theory:

4. And as computers with a single processor are replaced by machines with multiple processors and “multicore” processors software designers will need a new way to program desktop applications and operating systems.

II. Translate into English.

1. Если мы найдем ответы на эти вопросы, мы сможем разработать новую теорию.

2. Мы получим требуемый результат, если используем другую методику.

3. Если эксперимент пойдет успешно, мы сможем опубликовать результаты.

4. Я помогу тебе решить это уравнение, если ты дашь мне все необходимые данные.

III. Translate into Russian.

1. This marks a profound gap in our understanding, for if the value of some of these parameters had been even slightly different, the nuclear processes that power stars would likely have been disrupted, and without stars the universe would be a very different place.

2. And in fact it would not have greatly exceeded the speed of a skilled human calculator – but it would have been more reliable.

3. All our discoveries today are based on the ideas of men who lived before us; and without their groundwork, modern inventions would have been Impossible.

4. The resulting enhancement of capabilities, combined with expanded processing power and storage, allows today’s robots to do things such as vacuum a room or help to defuse a roadside bomb – tasks that would have been impossible for commercially produced machines just a few years ago.

5. The so-called “expert systems” succeed only within strictly limited areas of competence, but they would have amazed the computer programmers of the early 1950.

6. Were the value any bigger, space would expand so quickly that the universe would lack the structures that life requires. In a way, then, our very existence predicts the low value of the constant.

7. This straightforward technique might already be in common use, were it not for the draw backs associated with light-sensitive materials.

8. Had that material been maintained in the atmosphere it would have been more than enough to offset all the global warming expected this century.

9. This straightforward technique might already be in common use. were it not for the draw backs associated with light-sensitive materials.

IV. Translate the sentences.

1. If one were able to move information or matter from one point to another faster than light, then according to special relativity, there would be some inertial frame of reference in which the signal or object was moving backwards in time.

2. If super intelligent aliens appeared and claimed credit for creating life on earth (or even particular species), the purely evolutionary explanation would be cast in doubt. But no one has yet produced such evidence.

3. The classic example of a problem involving causality is the "grandfather paradox": what if one were togo back in time and kill one's own grandfather before one's father was conceived?

4. Such position is not shared by the elected leaders of New Mexico — if it were, the arguing would be over by now.

5. If the assembly were cooled merely by air, the metal surrounding the nuclear material would melt; it might even burn.

6. Einstein pointed out that many anomalous experiments could be explained if the energy of a Maxwell Ian light wave were localized into point-like quanta that move independently of one another, even if the wave itself is spread continuously over space.

7. If we restrict the computer to functioning at a cold temperature, if we find a way to let it get hot, we could improve that by a factor of another 100 million.

8. It would be fascinating if there were a halo of dark matter around Earth, just as there are the Van Allen belts, or rings around Saturn,.

9. If we hope to form a realistic view of the future, we cannot ignore it.

10. If they make all the parts right - including the way they mesh to form the whole - then the whole, too, will be right.

11. If the cosmic clock were rolled back to an early stage in the universe, these two forces would combine into a single force.

12. If everyone told everyone else the truth, relationships would descend into chaos.

13. So if a utility's customer base expanded or customers used more electricity then expected, it was to the benefit of a company's bottom line.

14. If the mass were reduced by a factor of more than about 10, nuclei could be made not just of protons and neutrons but also of other baryons containing strange quarks.

15. If customers used less electricity than expected, utilities failed to recover their capital costs, let alone secure money for profits or to invest in future projects.

16. If this estimate is supported by radioactive-dating tests soon to be undertaken at the University of California, the skull is the oldest yet discovered of the tool-making man.

17. If an event horizon has an extreme but finite spacetime curvature and gravity, how can there be any path between a low-gravity and curvature region and a singularity without passing through a horizon?

18. If the mass of the quarks were changed so that the neutron became 2 percent heavier than the proton, no long-lived form of carbon or oxygen would exist.

19. During the 1980s, many analysts thought industrial robotics would take off

20. If one were to see the night sky as a black wall and expect the technology race to screech to a polite halt, then it would be natural to fear that long-lived people would be a burden on the poor, crowded world of our children.

V. Write several conditional sentences.

Ex: Had we had that instrument then, we would have got more accurate result.

Could…

Should…

Were… (для настоящего времени)

Had… ( для прошедшего времени)

VI. Write a paragraph on the subject of your research. Include 4–5 conditional sentences.

Тема 9

I. Read the following paying attention to the form of the Infinitive.

Egged on by the suggestion that such new dark matter particles in our galactic halo might be directly detectable, a brave set of experimentalists began to devise techniques to observe them with detectors deep underground, far from the reach of most cosmic rays that would overwhelm such acute sensors.

II. Read the sentences and explain the use of the infinitive form.

1. As the ambulance was approaching us on the street, the sound of its siren seemed to be changing.

2. The conditions of modern life could be driving changes to genes for certain behavioral traits.

3. As this material disappears into the black hole it is reckoned tobe emitting a stream of X-rays, and these are what astronomers are observing.

III. Read and translate the sentences.

1. The company is confident enough in its new technology to have started construction of a new lab expected to mass-produce up to 500 such systems annually.

2. Galileo’s biggest contribution may have been his systematic study of motion, which was based on simple mathematical descriptions.

3. Bell seems to have been the first person to ask himself precisely what that question means.

4. Bell reasoned that if any manifestly and completely local algorithm existed, then Einstein and Bohr would have been right.

2. Answer the questions.

1. Do the situations in the predicate and the infinitive part happen at the same time?

2. Why is the Perfect Infinitive used in the above sentences?

IV. Translate the sentences paying special attention to the function of the Infinitive.

1. To reach for alternative sets of laws that still give rise to complex structures capable of sustaining life, one of the four known laws of nature must be eliminated.
2. To establish trust across organization boundaries is a qualitatively different problem from establishing it within organization.
3. To appreciate the significance of such an event, one needs to recognize that scientists have spent the past 40 years building a magnificent theoretical house of cards that could have toppled with the slightest whiff of inconsistent data.
4. To power tiny embedded systems, such as a BlackBerry Storm 2's touch screen or a car's airbag sensor, gadget makers often rely on piezoelectricity.
5. To take primarily inward-focused security technologies is not easy.
6. To come up with scientific questions isn’t difficult and doesn’t require training as a scientist.
7. One major hurdle for fuel cell makers is making them small enough to be able to work in laptops and other small personal electronics.

V. Translate the sentences.

1. The first computer of this type to be actually constructed and operated was the Manchester Mark I, designed and built at Manchester University in England.

2. To this day, the fusion of four protons to make helium 4 continues inside our sun, where it produces most of the energy that we receive from it.

3. All of the data, the names (locations) of the data, the operations to be performed on the data, must travel between memory and CPU a word at a time.

4. The sample to be analyzed is placed in a beam of X-rays and the diffraction pattern that is produced can be recorded on a photographic plate.

5. More than 40 years ago accelerator experiments revealed that the laws of physics are ever so slightly biased in favor of matter, and in a still to be understood series of particle interactions very early on, this slight bias led to the creation of the quark excess.

6. The previous century was the one to see immense changes and various inventions.

7. The neutrino is thought to have a mass between 100 and 1,000 times that of the proton, just within the reach of experiments to be conducted by the Large Hadron Collider at CERN near Geneva.

8. Although nuclear bombs were originally developed as strategic weapons to be carried by large bombers, from the 1950s nuclear weapons were produced for both strategic and tactical applications.

9. Newton was the first to describe the effects of gravity.

10. This in one of the first articles to focus attention on the perception of trust issues.

11. Schleiden was the first to recognize that all plants, and all the different parts of plants, are composed of cells.

12. The name applied to it comes from John von Neumann, who was the first to spell out the requirements for a general purpose electronic computer

13. ITER is the first fusion experiment designed specifically to explore the scientific issues associated with an ignited ( or near-ignited) plasma

14. In 1905, Einstein was the first to propose that energy quantization was a property of electromagnetic radiation itself.

15. The Cray-designed CDC 1604 was one of the first computers to replace vacuum tubes with transistors and was quite popular in scientific laboratories.

16. These ideas were to have a profound impact on the subsequent development of such machines.

17. Whatever the immediate cause of the sensed-presence effect (эффект присутствия), the deeper cause is to be found in the brain.

18. If such theory is to live up to expectations, it should explain some basic facts about the physical world.

19. Human beings are to go back to the Moon within the next 15 years and this time they will stay, according to ambitious plans to establish a lunar base announced by NASA.

20 .If the world is to do something about climate change, some people will have to reduce their emissions of greenhouse gases .

21. But that era is about to end.

22. The universe was already cold enough for baryons to form but not hot enough for baryons to undergo nuclear fusion.

23. For complex organic molecules to form, elements with the chemistry of hydrogen and oxygen need to be present.

24. Space would expand too quickly for structures such as galaxies to have a chance to form or else that the universe would exist for a fraction of a second before recollapsing.

25. Whether those elements would be produced abundantly enough for life to evolve somewhere within them is an unanswered question.

26. The ball is simply too big for its exact location to go undetected for any perceivable amount of time.

27. For a robot army to be en effective fighting force, it would be best if individual robots could asses situations and make decisions without relying on human input.

28. This so-called big bang nucleosynthesis took place a few seconds into the life of our universe, when it was already cold enough for baryons to form but still hot enough for the baryons to undergo nuclear fusion.

29. It took yet another 30 years for physicist to finally look these issues squarely in face.

Тема 10

I. Translate the sentences.

1. Taking a single page and turning it into a three-dimensional pattern isn't much use in itself.
2. Remaining in this barrier is the problem of decoherence; much work on error-correcting techniques still needs to be done to compensate for results of the difficulties of working on such a small scale.
3. Programming computers to equal human abilities will require fresh insights into human psychology.
4. Changing patterns of rainfall will lead to local shortages of food and safe drinking water.
5. Working out of how bad such an event would be is an urgent but very difficult ethical problem.
6. Making these applications faster and more accurate has generally meant throwing more number-crunching capacity at them.
7. Putting causalty back into quantum-generational models is the only known cure for the instabilities of superposed space time geometries.
8. Using wrapper software to protect legacy code is a proven technology in the security community.
9. Turning CO2 into fuels is exactly what photosynthetic organisms have been doing for billions of years.
10. Pursuing such technology, you take electricity and combine CO2 with hydrogen to make gasoline.
11. The company would like to improve the process mimicking the process of photosynthesis.
12. Using nothing but sunlight and CO2, genetically engineered plant life produces fuel – common gasoline.
13. Looking into the hologram, someone “sees” the object even though it may no longer be present.
14. The atomic force microscope is a powerful tool in physics, able to image individual atoms by relying on a tiny probe dragged across a surface.
15. In characterizing the difficulties presented by these four properties, their inconsistencies with higher level languages are emphasized.
16. By clever design Cray cut the distances signals had to travel, thereby speeding up the machines.
17. These spacecraft however, were only able to spend a few weeks collecting detailed data on Saturn and its 34 known moons – not enough to fully understand the forces at work in those intriguing rings.
18. By elevating the electrode above the rest of the assembly, the level of access can be increased, although that comes at the cost of weakening the strength of the trap.
19. Analyzing data from the Mars rovers, physicists are doing their best to find the answers for many problems.
20. Choosing the best algorithm and sifting out the essential data are central to the art of machine learning.
21. Using an alphabet of four symbols and making use of only seven states, this table consists of just 28 instructions.
22. Using such ultra cold atoms is important because they begin to fall within a vacuum chamber.
23. Carrying excess fat, Americans are at increased risk of death from heart disease, diabetes and various kinds of cancer.
24. Preparing for manned missions to Mars, developing and testing survival technology and serving as a staging post for flights to the Red Planet, the station will operate chiefly as a science laboratory.
25. Heating a building can be done passively, but with the use of a fan in the solar thermal system, the people inside the building can stay much warmer since the air will be circulated.
26. Standing on the threshold of the fifth generation, we clearly expect more from future computers than just more speed.
27. Sadly, some inventions are immensely appealing in concept but just not very good in practice.
28. The amount required to fly an appreciable distance rapidly became impractical to attach to a user's back.
29. The costs associated with spaceflight remain high, which means that building these factories in space and lofting raw materials to them would be neither easy nor inexpensive.
30. Yawn-inducing federal decisions about standards for electronic devices and the availability of the broadcast spectrum for commercial use indirectly dictate the rate and results of electronic device development.
31. Their solid-state nature also meant transistors could be mass-produced and miniaturized in ways that vacuum tubes could not, and their reliability meant that larger devices incorporating greater numbers of components would be feasible.
32. "A technology-of-the-20th-century” symposium held in 1895 might not have mentioned airplanes, radio, antibiotics, nuclear energy, elec­tronics, computers or space exploration.
33. Cray always strove to create the fastest possible computer for the scientific market, always programmed in the scientific programming language of choice (FORTRAN) and always optimized the machines for demanding scientific applications.
34. The ever-increasing shortage of fossil fuels, rising gasoline prices, and global warming are causing people and governments to look with greater interest at renewable resources as a viable and more "earth-friendly" option to the energy problem.
35. Only about one percent of this energy put out by the sun is harnessed and utilized by Earth's inhabitants.
36. Some scientists believe such gravity may also be behind the accelerated expansion of the universe, currently attributed to a mysterious dark energy.

II. Translate into English.

* 1. Результаты, полученные группой ученых, были интересными.
  2. Ученые, получившие эти результаты, работают в нашей лаборатории.
  3. Используемые сегодня альтернативные источники энергии являются дорогими.
  4. Страны, использующие альтернативные источники энергии, уже почувствовали

преимущества этого.

* 1. Аспиранты, решающие эту задачу, добились некоторого успеха.
  2. Задача, решенная за такой короткий срок, была действительно трудной.

2.1. Do the actions of the predicate and the Participle happen at the same time?

1. Having convinced ourselves that our quantum-gravity model passed a number of classical tests, it was time to turn to another kind of experiment.
2. Having increased 3 to 5 percent a years for the past decade, the cost of solar panels has fallen 20 percent for every doubling of its installed base.
3. Having exhausted the fuel that sustained it for millions of years, the star is no longer able to hold itself up under its own weight, and it starts collapsing catastrophically.
4. Having previously assumed that his statement holds, they have spent the past several decades formulating various laws that black holes should obey.
5. Section 6 illustrates how we generate circuits after having derived the atomic action exe­cution schedule using the algorithm from Section 5.
6. Having worked out a way to use bouncing atoms to do atom interferometry, the teem plans to reduce the number of atoms that are lost in the experiment.
7. After revealing that the attacks targeted not only its core intellectual property but e-mail accounts of Chinese human-rights activists, Google announced that it would stop censoring search results on its Chinese-language engine.
8. Having designed their most efficient prototype, the scientists detailed their findings online.
9. After demonstrating the performance of the new device in rats they see no reason why they cannot work in people as well.
10. They have to release CO2 to the atmosphere despite having attached idry-adsorption technology to capture it.
11. The world freshwater supply becoming scarcer, salt-tolerant crops could ease the burden.
12. Researches at Australia’s University of Adelaide used genetic engineering to enhance a model crop’s natural ability to prevent saline buildup in the leaves, allowing the plant to thrive in conditions that would typically wither it.
13. A program or “instruction table” for a Turing machine is a finite collection of instructions, each calling for certain atomic operations to be performed if certain conditions are met.
14. Assuming that no new forces of nature intervene, horizons should be governed purely by general relativity.
15. For two clocks moving initially relative to one another, this effect is reciprocal, with each clock measuring the other to be ticking slower.
16. With greenhouse gas emissions continuing to rise, strong efforts will be required to reverse global warming.
17. Assuming a world that is slow to adapt to climate change and focused on regional self- reliance, the researchers found that children in the developing world—which are the countries expected to provide the bulk of population growth to nine billion or more by mid-century – will be hardest hit.
18. Science is incapable of making value judgments.
19. Loll, a professor at Utrecht University, enjoys playing chamber music.
20. That was encouraging but not yet the same as showing that these rules are enough to stabilize a full four-dimensional universe.
21. Instead of disregarding causality when assembling individual universes and hoping for it to reappear through the collective wisdom of the superposition, we decided to incorporate the casual structure at a much earlier stage.
22. Good security hygiene is worth pursuing, but it cannot be information security’s primary goal.
23. We are far from understanding how to effectively engineer systems that deliver adequate trust to users.
24. Experts are very bad at predicting the future.
25. The idea of controlling the function of a computing machine by storing a program was Turing’s greatest contribution to the development of the digital computer.
26. Emissions and global temperatures keep going up and up and up.
27. Despite their shielding power, such materials won’t do for building a spaceship.
28. Major retailers have introduced this technique in recent years with an eye to saving billions on inventory and labor cost.
29. Rather than passively listening to music, the researcher advocates putting an instrument into the hands of a youngster to raise intelligence.
30. Benjamin Franklin is credited with conceiving the idea of daylight saving in 1794 to conserve candles.
31. It becomes possible to envisage development of implantable robots capable of compensating for failing functions in human beings.
32. Imagine being present at the birth of a new industry.
33. The access to cheap computing power has permitted scientists to work on many of the hard problems that are fundamental to making robots practical.
34. Our recent studies, however, suggest that some of these other universes – assuming they exist – may not be so inhospitable after all.
35. You can examine the data in different ways, on different timescales and for a wide variety of technologies, ranging from electronic to biological.
36. Spam filters, search engines and even genome sequence analysis applications are simultaneously checking alternatives, computing their probabilities and choosing those options that have the greatest likelihood of being correct.
37. Besides being a well-known scientist he has a reputation of an accomplished the cook – a claim that the editors look forward to evaluating firsthand.

**3.4. Контрольные оценочные средства для проведения экзамена.**

**3.4.1. Экзаменационные билеты.**

Билет №1

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

**Coherer**

The coherer is a primitive form of radio signal detector used in the late 1800s consisting of a capsule of metal filings in the space, sometimes evacuated, between two conductors. It was a key enabling technology that led to radio, and was the first device used to detect radio signals in practical wireless telegraphy. Its operation is based upon the large resistance offered to the passage of electric current by loose metal filings that decreases under the influence of radio frequency alternating current. The coherer became the basis for radio reception around 1900, and remained in widespread use for about ten years. The coherer saw commercial use again in the mid-1900 in a few primitive radio-controlled toys that used spark-gap transmitter controllers. There are two basic kinds of coherers, the original metal filings type and a later, imperfect junction type.

How it works

The metal particles in a particle coherer cohere and conduct electricity much better when subjected to high frequency electricity. Recent experiments[[1]](#footnote-1)with particle coherers seem to have confirmed the hypothesis that the particles cohere by a micro-weld phenomenon caused by radio frequency electricity flowing across a small contact area. The effect is to cause a reduction in electrical resistance that is not persistent because the mechanically weak joints are easily broken by mechanical disturbance caused by the decoherer. The underlying principle of other kinds of so-called "imperfect contact" coherers may involve a kind of sub-atomic tunneling of charge carriers across an imperfect junction between conductors.

**2. Speak on the topic:** *The nuclear issue*

**3. Listen to the text and fill in the gaps:**

Many scientists say nuclear energy \_\_\_\_\_\_\_\_\_\_\_\_. Many normal people aren’t so sure. I think \_\_\_\_\_\_\_\_\_\_\_\_ worry about nuclear energy. We hear on the news about the dangers of nuclear power. Many years ago there was \_\_\_\_\_\_\_\_\_\_\_\_ in Chernobyl, Russia. A nuclear reactor caught fire and melted. Because of this, deadly radiation spread across \_\_\_\_\_\_\_\_\_\_\_\_ Europe. There were reports that sheep in England caught radiation sickness. I think things are safer now. Many countries trust nuclear energy. France and Japan \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of nuclear power stations. I think it’s probably a good idea. We really need to stop \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Nuclear power is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the environment. Perhaps we need to spend more money \_\_\_\_\_\_\_\_\_\_\_\_ safer.

Билет №2

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

**Nuclear Weapons**

The first atomic bomb (or A-bomb), which was tested on July 16, 1945, near Alamogordo, New Mexico, represented a completely new type of artificial explosive. All explosives prior to that time derived their power from the rapid burning or decomposition of some chemical compound. Such chemical processes release only the energy of the outermost electrons in the atom. Nuclear explosives, on the other hand, involve energy sources within the core, or nucleus, of the atom. The A-bomb gained its power from the splitting, or fission, of all the atomic nuclei in several kilograms of plutonium. A sphere about the size of a baseball produced an explosion equal to 20,000 tons of TNT. Nuclear weapons were the first true weapons of mass destruction and their use at the end of World War II, and subsequent deployment, changed the nature of international relations for all time. The A-bomb was developed, constructed, and tested by the Manhattan Project, a massive United States enterprise that was established in August 1942 during World War II. Many prominent scientists, including the physicists Enrico Fermi, Richard Feynman, Isador Rabi, Edward Teller and the chemist Harold Urey, were associated with what was the world's biggest scientific project, whose military head was US Army engineer Major General Leslie Groves. The scientific director of the project, which was based at Los Alamos, New Mexico, was US physicist J. Robert Oppenheimer. After the war, the US Atomic Energy Commission became responsible for the supervision of all nuclear matters, including\_weapons research. Other types of bombs were developed to tap the energy of light elements, such as hydrogen. In these bombs the source of energy is the fusion process, in which nuclei of the isotopes of hydrogen combine to form a heavier helium nucleus (see Thermonuclear, or Fusion, Weapons below). This weapons research has resulted in the production of bombs that range in power from a fraction of a kiloton (1,000 tons of TNT equivalent) to many megatons (1 million tons of TNT equivalent).

**2. Speak on the topic:** *The future of energy*

**3. Listen to the text and fill in the gaps:**

Nuclear weapons \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ invented by man. The day we invented them \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ our history. Fortunately, they have only been used a few times. We \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the history of what happened in Japan to understand why nuclear weapons \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ again. The Japanese cities of Hiroshima and Nagasaki were \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Hundreds of thousands died. Today, nuclear weapons are a hundred times more powerful. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ how much harm one nuclear bomb could cause. Even scarier, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ terrorists get hold of nuclear weapons. I fear for our future. One day, all countries will have nuclear weapons and then we’ll \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Билет №3

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

**Answers in the Quark Soup**

Earlier than a microsecond, even protons and neutrons could not exist and the universe was a soup of nature's basic building blocks: quarks, leptons, and the force carriers (photons, the *W* and Z bosons and gluons). We can be confident that the quark soup existed because experiments at particle accelerators have re-created similar conditions here on Earth.

To explore this epoch, cosmologists rely not on bigger and better telescopes but on powerful ideas from particle physics. The development of the Standard Model of particle physics 30 years ago has led to bold speculations, including string theory, about how the seemingly disparate fundamental particles and forces are unified. As it turns out, these new ideas have implications for cosmology that are as important as the original idea of the hot big bang. They hint at deep and unexpected connections between the world of the very big and of the very small. Answers to three key questions — the nature of dark matter, the asymmetry between matter and antimatter, and the origin of the lumpy quark soup itself— are beginning to emerge.

It now appears that the early quark soup phase was the birthplace of dark matter. The identity of dark matter remains unclear, but its existence is very well established. Our galaxy and every other galaxy as well as clusters of galaxies are held together by the gravity of unseen dark matter. Whatever the dark matter is, it must interact weakly with ordinary matter; otherwise it would have shown itself in other ways. Attempts to find a unifying framework for the forces and particles of nature have led to the prediction of stable or long-lived particles that might constitute dark matter. These particles would be present today as remnants of the quark soup phase and are predicted to interact very weakly with atoms.

One candidate is the called the neutralino, the lightest of a putative new class of particles that are heavier counterparts of the known particles. The neutralino is thought to have a mass between 100 and 1,000 times that of the proton, just within the reach of experiments to be conducted by the Large Hadron Collider at CERN near Geneva. Physicists have also built ultrasensitive underground detectors, as well as satellite and balloon-borne varieties, to look for this particle or the by-products of its interactions.

A second candidate is the axion, a superlight-weight particle about a trillionth the mass of the electron. Its existence is hinted at by,„subtleties that the Standard Model predicts in the behavior of quarks. Efforts to detect it exploit the fact that in a very strong magnetic field, an axion can transform into a photon. Both neutralinos and axions have the important property that they are, in a specific \* technical sense, "cold." Although they formed under broiling hot conditions, they were slow-moving and thus easily clumped into galaxies.

**2. Speak on the topic:** *Protecting the environment*

**3. Listen to the text and fill in the gaps:**

The universe is a big place. I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can understand just how big. The universe never, ever ends. It \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ size. It’s funny when scientists say they want to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the universe. That’s impossible. There are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ secrets out there. The universe has given us an adjective in English \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When we say something is universal, it doesn’t make sense. That’s because we’re saying \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ happens all around the universe, when in fact, it only happens on Earth. Another \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the word universe is that people talk about their universe. Sometimes they say their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when something sad happened. Scientists even call our brain a mini universe.

Билет № 4

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

BETTER MODELS

Nobody lives in the global average climate. Nor are the massive grid cells favored by climate models run on today's supercomputers as useful as they could be for planning purposes, given that they can encompass 10,000 square kilometers. Now the National Science Foundation (NSF), along with the U.S. Energy and Agriculture departments are teaming up to financially support the development of new computer models aimed at revealing the anticipated effects of climate change at the regional level.

The goal will be to deliver a scientific basis for regional planning purposes, whether that involves adaptation to a disappearing coastline or to the expected severity of droughts. Those models will look at impacts such as regional average temperature change, sea-level rise, ocean acidification, and the sustainability of soils and water as well as the impacts of invasive species on food production and human health. Nor will it be confined to ecological concerns.

A big part of the effort will rely on advances in computer power; the Department of Energy (DoE) now hosts the world's most powerful supercomputer at its Oak Ridge National Laboratory. Such petaFLOP-scale (quadrillion-operation-per-second) computers will help scientists to improve both the time and spatial scales of their models. Of course, such computer models are only as good as the entered data, so additional information from ongoing observation campaigns—whether that is the DoE's Atmospheric Radiation Measurement program or the NSF's National Ecological Observatory Network—will be needed to provide a fuller understanding of how soot and other aerosols impact the global climate as well as the role of clouds. Ultimately, the biggest impacts to be felt regionally may be on agriculture. "Producers of food will need to know what to expect in the future to be ready for the kinds of changes that are anticipated," said Department of Agriculture chief scientist, Roger Beachy. "We are concerned about the impact on our ability to grow food." For its part, Agriculture hopes to be able to determine what the overriding impacts and concerns might be for a given multistate region as well as offer advice on farming practices that might curtail agricultural contributions to greenhouse gas emissions.

**2. Speak on the topic:** *Technical measures to reduce pollution*

**3. Listen to the text and fill in the gaps:**

Electricity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ most important inventions ever. It is the thing that powers the Earth. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ no electricity, we’d be back in the dark ages. Few people stop and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ amazing electricity is. With the flick of a switch, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ almost anything. Think \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ happen if there was no electricity. We’d have no TV, no computers, no traffic signals. It would be like \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ living in caves. There are a few \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ about electricity, of course. Number one, it’s dangerous. Thousands \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ each year from electrocuting themselves or in electrical fires. And number two, it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the environment. Most electricity comes from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and that creates greenhouse gasses.

Билет №5

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

Doctors are often faced with the challenge of performing microsurgery to repair blood vessels, transplant tissue or reattach a severed limb. These procedures are very intricate, and surgery is often not the most effective solution since it can be very invasive and difficult to conduct. Soon, many surgeons could be turning to nanotechnology and performing delicate tasks by remotely controlling tiny robots, similar in size to a grain of rice, that could travel through the body. At Tohuku University in Japan, electrical engineer Kazushi Ishiyama and his group have designed tiny spinning screws that can swim through veins in the body. They can potentially burrow into tumours to kill them or deliver drugs to a specific tissue or organ. Since they are so small, they could be injected into the body using a standard hypodermic needle and once inside, could be magnetically steered around the body using a 3D magnetic field supply and controller. Ishiyama believes that these devices will be particularly useful for removing brain tumours since they are difficult to operate on.

**Miniature motors**

Instead of relying on a magnetic field, other researchers are creating microrobots powered by tiny motors that **c**ould swim through the body and help with diagnosing and treating certain conditions. Dr. James Friend and a team of mechanical engineers at Monash University in Australia have already built a liner motor the size of a salt crystal, but are now working to create an even smaller one the width of two human hairs.. Its propulsion mechanism is similar to what the bacteria E. coli uses to swim through the body. A rotating motor whirls the flagella around its axis, much like a stockwhip, and if it is in a liquid, it screws its way through the fluid. "Imagine a pizza maker who takes a round ball of dough and, as he throws it into the air, he spins it so it turns into a helical motion. Well, our motor does the same thing, except it spins 100,000 times a second," says Friend. These microbots could potentially be used in microsurgery, for example to clear out the build up of plaques within arteries. The technology also has potential for creating new legs or fingers for amputees by allowing new muscle cells to grow over artificial bones.

**2. Speak on the topic:** *The Kyoto Protocol*

**3. Listen to the text and fill in the gaps:**

I hate pollution. It \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angry. I think pollution is greed. People \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the environment so they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to make lots of money. Big companies are the worst. They \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ polluting. They have the money to say they are “green”. Pollution affects us all. We are all less healthy because of companies \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or our rivers. Everybody needs to think about how we can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of pollution we create. Not using the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ walk is one way. Turning off lights we don’t need is another. Barack Obama says he’s going \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ help the Earth. I really hope he does because if pollution gets any worse, we’ll be in seriously big trouble.

Билет №6

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher

**Spent Reactor Fuel Storage and Power Plant Decommissioning**

Spent reactor fuel assemblies are highly radioactive and must initially be stored in specially designed pools resembling large swimming pools, where water cools the fuel and acts as a radiation shield, or in specially designed dry storage containers. An increasing number of reactor operators now store their older spent fuel in dry storage facilities using special outdoor concrete or steel containers with air cooling. There is currently no permanent disposal facility in the United States for high-level nuclear waste. High-level waste is being stored at nuclear plants. When a nuclear power plant stops operating, the facility must be decommissioned. This involves safely removing the plant from service and reducing radioactivity to a level that permits other uses of the property. The Nuclear Regulatory Commission has strict rules governing nuclear power plant decommissioning that involve cleanup of radioactively contaminated plant systems and structures, and removal of the radioactive fuel. An uncontrolled nuclear reaction in a nuclear reactor can potentially result in widespread contamination of air and water with radioactivity for hundreds of miles around a reactor. The risk of this happening at nuclear power plants in the United States is considered to be very small due to the diverse and redundant barriers and numerous safety systems at nuclear power plants, the training and skills of the reactor operators, testing and maintenance activities, and the regulatory requirements and oversight of the Nuclear Regulatory Commission. A large area surrounding nuclear power plants is restricted and guarded by armed security teams. U.S. reactors have containment vessels that are designed to withstand extreme weather events and earthquakes.

**2. Speak on the topic:** *Safety and security issues in nuclear area*

**3. Listen to the text and fill in the gaps:**

Global warming \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ problem in the world today. Everyone know about it but not everyone is trying to stop it. Many world leaders are more interested \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ countries for the crisis. Countries like China, India and Russia say they will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ America takes more action. America says it will not act \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ take more action. It seems a little childish that leaders are acting \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . The future of our world is at risk and governments \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with each other. Many presidents and prime ministers tell us that technology \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . They say future scientists will find solutions to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . This is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . I hope they are right. I don’t believe them, so I’ll continue switching off \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Билет №7

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher

**Nonrenewable energy**

We get most of our energy from nonrenewable energy sources, which include fossil fuels (oil, natural gas, and coal). These energy sources are called fossil fuels because they were formed over millions of years by the action of heat from the earth's core and pressure from rock and soil on the remains (or fossils) of dead plants and creatures like microscopic diatoms. Another nonrenewable energy source is uranium, whose atoms can be split (through a process called nuclear fission) to create heat and eventually electricity. We use renewable and nonrenewable energy sources to generate the electricity we need for our homes, businesses, schools, and factories. Electricity powers our computers, lights, refrigerators, washing machines, and heating and cooling systems. Most of the gasoline used in cars and motorcycles, and the diesel fuel used in trucks, tractors, and buses are both made from crude oil and other hydrocarbon liquids that are nonrenewable resources. Natural gas, used to heat homes, dry clothes, and cook food, is also a nonrenewable resource.

The use of renewable energy is not new. More than 150 years ago, wood, which is one form of biomass, supplied up to 90% of our energy needs. As the use of coal, petroleum, and natural gas expanded, the United States became less reliant on wood as an energy source. Today, we are looking again at renewable sources to find new ways to use them to help meet our energy needs.

In 2012, consumption of renewable sources in the United States totaled about 9 quadrillion Btu — 1 quadrillion is the number 1 followed by 15 zeros — or about 9% of all energy used nationally. About 12% of U.S. electricity was generated from renewable sources in 2012.

Over half of renewable energy goes to producing electricity. The next largest use of renewable energy is biomass (wood and waste) for the production of heat and steam for industrial purposes and for space heating, mostly in homes. Biomass also includes biofuels, such as ethanol and biodiesel, used for transportation. Renewable energy plays an important role in the supply of energy. When renewable energy sources are used, the demand for fossil fuels is reduced. Unlike fossil fuels, non-biomass renewable sources of energy (hydropower, geothermal, wind, and solar) do not directly emit [greenhouse gase](http://www.eia.gov/energyexplained/index.cfm?page=environment_about_ghg).

**2. Speak on the topic:** *Regulation of the energy market*

**3. Listen to the text and fill in the gaps:**

Rubbish is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. I’m fed up with it. Every time I walk down the street, I’m almost falling over it. I don’t know why people \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rubbish away properly. They \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ no respect for others. They don’t seem to care about the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It’s the same in every country. There’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, even though there are rubbish bins everywhere. Rivers are full of plastic bags and bottles. This makes a beautiful \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. And the countryside is full of rubbish. People even throw their TVs and fridges into fields, or anywhere they think \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ them. Where I live now, people throw rubbish in the street \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They think other people will pick it up.

Билет №8

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher

**Types of Ionizing Radiation**

Some unstable atoms emit alpha particles (α). Alpha particles are positively charged and made up of two protons and two neutrons from the atom’s nucleus, as shown in the illustration at the right. Alpha particles come from the decay of the heaviest radioactive elements, such as uranium, radium and polonium. Even though alpha particles are very energetic, they are so heavy that they use up their energy over short distances and are unable to travel very far from the atom. The health effect from exposure to alpha particles depends greatly on how a person is exposed. Alpha particles lack the energy to penetrate even the outer layer of skin, so exposure to the outside of the body is not a major concern. Inside the body, however, they can be very harmful. If alpha-emitters are inhaled, swallowed, or get into the body through a cut, the alpha particles can damage sensitive living tissue. The way these large, heavy particles cause damage makes them more dangerous than other types of radiation. The ionizations they cause are very close together--they can release all their energy in a few cells. This results in more severe damage to cells and DNA. Beta particles (β) are small, fast-moving particles with β a negative electrical charge that are emitted from an atom’s nucleus during radioactive decay. These particles are emitted by certain unstable atoms such as hydrogen-3 (tritium), carbon-14 and strontium-90. Beta particles are more penetrating than alpha particles but are less damaging to living tissue and DNA because the ionizations they produce are more widely spaced. They travel farther in air than alpha particles, but can be stopped by a layer of clothing or by a thin layer of a substance such as aluminum. Some beta particles are capable of penetrating the skin and causing damage such as skin burns. However, as with alpha-emitters, beta-emitters are most hazardous when they are inhaled or swallowed.

**2. Speak on the topic:** *Arguments for and against nuclear power*

**3. Listen to the text and fill in the gaps:**

When I was young, we \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ recycling. It wasn’t important. People would \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for recycling things. Today, things are different. We now know we have a problem. We \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and throw everything away. Lots of the stuff we throw away is very useful. It \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, recycled. This is good for the environment because we use fewer natural resources. I love recycling. It \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ though I’m helping the Earth. I even buy things like used furniture and clothes. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Some of the countries I’ve lived in are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. There are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at the end of the street and places to leave newspapers, clothes, batteries and metal.

Билет №9

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher

**Gamma Rays and X-Rays**

Gamma rays (γ) are weightless packets of energy called photons. Unlike alpha and beta particles, which have both energy and mass, gamma rays are pure energy. Gamma rays are similar to visible light, but have much higher energy. Gamma rays are often emitted along with alpha or beta particles during radioactive decay.

Gamma rays are a radiation hazard for the entire body. They can easily penetrate barriers, such as skin and clothing that can stop alpha and beta particles. Gamma rays have so much penetrating power that several inches of a dense material like lead or even a few feet of concrete may be required to stop them. Gamma rays can pass completely through the human body easily; as they pass through, they can cause ionizations that damage tissue and DNA.Because of their use in medicine, almost everybody has heard of x-rays. X-rays are similar to gamma rays in that they are photons of pure energy. X-rays and gamma rays have the same basic properties but come from different parts of the atom. X-rays are emitted from processes outside the nucleus, but gamma rays originate inside the nucleus. They also are generally lower in energy and, therefore, less penetrating than gamma rays. X-rays can be produced naturally or artificially by machines using electricity.

Literally thousands of x-ray machines are used daily in medicine. Computerized tomography, commonly known as CT or CAT scans, uses special x-ray equipment to make detailed images of bones and soft tissue in the body. Medical x-rays are the single largest source of man-made radiation exposure. X-rays are also used in industry for inspections and process controls.

**2. Speak on the topic:** Nuclear fusion

**3. Listen to the text and fill in the gaps:**

X-rays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They were invented a really long time ago. I think when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, they were real, cutting edge technology. I think a lot of people \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ could see photos of the inside of their body. So OK, it's only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but still, that was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fifty years ago. Today, we all have X-rays. Even when we go to the dentist, we have X-rays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Of course, X-rays are not just used in hospitals. Every time we go to an airport \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ through an X-ray machine. The security guys can check to see if we have anything dangerous. Recently, I have seen X-ray machines in all kinds of places – even hotels. I even \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ schools.

Билет №10

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher

**Understanding Radiation Risks**

Radiation can damage living tissue by changing cell structure and damaging DNA. The amount of damage depends upon the type of radiation, its energy and the total amount of radiation absorbed. Also, some cells are more sensitive to radiation. Because damage is at the cellular level, the effect from small or even moderate exposure may not be noticeable. Most cellular damage is repaired. Some cells, however, may not recover as well as others and could become cancerous. Radiation also can kill cells. The most important risk from exposure to radiation is cancer. Much of our knowledge about the risks from radiation is based on studies of more than 100,000 survivors of the atomic bombs at Hiroshima and Nagasaki, Japan, at the end of World War II. Other studies of radiation industry workers and studies of people receiving large doses of medical radiation also have been an important source of knowledge. Scientists learned many things from these studies. *The most important are:* The higher the radiation dose, the greater the chance of developing cancer. The chance of developing cancer, not the seriousness of the cancer, increases as the radiation dose increases. Cancers caused by radiation do not appear until years after the radiation exposure. Some people are more likely to develop cancer from radiation exposure than others. Radiation can damage health in ways other than cancer. It is less likely, but damage to genetic material in reproductive cells can cause genetic mutations, which could be passed on to future generations. Exposing a developing embryo or fetus to radiation can increase the risk of birth defects. Although such levels of exposure rarely happen, a person who is exposed to a large amount of radiation all at one time could become sick or even die within hours or days. This level of exposure would be rare and can happen only in extreme situations, such as a serious nuclear accident or a nuclear attack.

**2. Speak on the topic:** *Developments in nuclear power*

**3. Listen to the text and fill in the gaps:**

What \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology? Would we still be living in caves? Probably. I think there are two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology. The kinds before and after computers. When we think about technology before computers, it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It was all mechanical. Things like steam trains and fridges. At the time, that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology. But, today’s technology is really cutting edge. It’s the kind of technology that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ soon as it hits the shelves. I love this. It’s so exciting seeing it all happen. I love \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology we’ll have in the future, and then buy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It’s like buying technology from science fiction movies. I’d love to live to be 200 so I can see what technology.

Билет №11

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

The ever-increasing shortage of fossil fuels, rising gasoline prices, and global warming are causing people and governments to look with greater interest at renewable resources as a viable and more "earth-friendly" option to the energy problem. These renewable resources include wind, solar, geothermic and hydrogen power. Within forty minutes of the sun\_shining on the earth, the sun will have given off as much energy as the entire world population will use in a year. Only about one percent of this energy put out by the sun is harnessed and utilized by Earth's inhabitants. The use of solar energy as a power source is not a new one. But the panels developed in the 1970s were so bulky and large; that very few people could afford them, much less use them. Using technology developed for the computer industry, cells used in Photovoltaic solar collection systems are now thinner and more diversified. Perhaps the greatest advancement in Photovoltaic research has been thin cell solar research, or nanotechnology. This is the use of very tiny cells created through silicon and other minerals to collect solar energy. The creation of nanoparticles has allowed developers to create shingles coated in these cells as well as to develop a spray-on coating that can be sprayed onto another material, such as the roof of a building. This spray-on coating contains the nanoparticles and enables other items to also collect solar energy and convert it into electricity. The use of thin cells makes the solar panels smaller and more available to the common consumer. This is because many houses within cities have to conform to specific city codes and may also have to conform to Home Owner Association rules. These rules may not allow the use of solar panels because they are large, visually unappealing, and may obstruct a neighbor's view. By using thin cells, there will be fewer complaints from the neighbors and if the homeowner uses solar panels that are part of the roofing material, the neighbors won't see the panels at all. Solar energy can be used not only for generating electricity, but also for heating and even cooling spaces, as well as heating water. Using solar energy for heating and cooling is called Solar Thermal. These systems can be active or passive. If the system is active, then moving parts are involved and if it is passive, than there are no moving parts used in addition to the collection unit.

**2. Speak on the topic:** *The cost of protecting the environment*

**3. Listen to the text and fill in the gaps:**

Every country \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ free healthcare to its citizens. I can’t understand why the richest countries in the world \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . It’s shocking that a country can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and let its people die because they cannot pay the hospital. I saw \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ once on America’s healthcare system. It’s called “Sicko,” directed by Michael Moore. He went to England and France \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that people in those countries didn’t have to pay when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hospital. He \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Cuba. He went with lots of Americans who couldn’t afford healthcare in America. Amazingly, the Cuban hospitals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for free \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ medicine. They were so happy. I’m sure there’s enough money \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to provide everyone with free healthcare.

Билет №12

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

**Are We Smart Enough?**

Despite the example of the evolution of human beings, critic may sti|l argue that our limited intelligence may somehow prevent us from programming genuinely intelligent machines. This argument seems weak, amounting to little more than a claim that because the critic can't see how to succeed, no one else will ever do better. Still, few would deny that programming computers to equal human abilities will indeed require fresh insights into human psychology. Though the programming path to Al seems open, our knowledge does not justify the sort of solid confidence that thoughtful engineers had (decades before Sputnik) in being able to reach the Moon with rockets, or that we have today in being able to build assemblers through protein design. Programming genuine artificial intelligence, though a form of engineering, will require new science. This places it beyond firm projection. We need accurate foresight, though. People clinging to comforting doubts about Al seem likely to suffer from radically flawed images of the future. Fortunately, automated engineering escapes some of the burden of biochauvinist prejudice. Most people are less upset by the idea of machines designing machines than they are by the idea of true general-purpose Al systems. Besides, automated engineering has been shown to work; what remains is to extend it. Still, if more general systems are likely to emerge, we would be foolish to omit them from our calculations. Is there a way to sidestep the question of our ability to design intelligent programs? In the 1950s, many Al researchers concentrated on simulating brain functions by simulating neurons. But researchers working on programs based on words and symbols made swifter progress, and the focus of Al work shifted accordingly. Nonetheless, the basic idea of neural simulation remains sound, and molecular technology will make it more practical. What is more, this approach seems guaranteed to work because it requires no fundamental new insights into the nature of thought.

**2. Speak on the topic:** *Energy saving*

**3. Listen to the text and fill in the gaps:**

I never \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ about my health until recently. When I was a kid, I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ exercise. Even in my twenties and thirties I was very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ill. I have been lucky all my life – always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ health. I rarely get even a cold. I suppose \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with you. Now I seem to be getting lots of little \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. I should go to the doctor for a health check, but I’m too busy. The older you get, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ about your health. One good thing is that I’m eating more healthily now \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. I no longer have fast food and midnight snacks. I also sleep \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. I’ve read that getting seven or eight hours sleep every night \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ best things you can do for your health.

Билет №13

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

Nearly 2,500 years ago, the ancient Greeks asked a seemingly simple question that has wended its way through the ages and is still very much with us: What is the universe made of**?** That is, what are the fundamental ingredients out of which everything in the heavens and on Earth is composed? Or, to put the question another way, if you take any object whatsoever—a block of wood, a chunk of iron—and you cut it in half and then cut that half in half again, and keep cutting on and on, what is the most basic constituent you will ultimately come upon?

Democritus proclaimed that you would come upon what he called atoms, from the Greek for "uncuttable." By the late 1800s, scientists had realized that substances such as oxygen and carbon did **i**n fact have a smallest recognizable constituent, which (taking their cue from Democritus) they christened atoms. Yet over the next few decades, experiments revealed that atoms, contrary to the ancient Greek conception, surely must be cuttable, since they were an agglomeration of smaller particles: a swarm of electrons orbiting a central nucleus containing protons and neutrons. Moreover, in the early part of the twentieth century, physicists showed that understanding the behavior of these constituents meant replacing nineteenth-century ideas about matter and energy with the strange new laws of quantum mechanics. And by the early 1930s, physicists studying quantum mechanics realized that it required one of the most dramatic upheavals science has ever experienced: Science could no longer be expected to predict with certainty the outcome of experiments. In the microscopic realm, quantum mechanics showed that science could only predict the probability that a particular outcome might occur.

Although Albert Einstein contributed significantly to the early development of quantum mechanics, he focused much of his attention on gravity, a force that has its greatest relevance in the vastly larger realm of stars and galaxies. His general theory of relativity, proposed in 1916, correctly predicted the bending of starlight by the Sun and explained Edwin Hubble's 1929 measurements indicating that the universe is expanding. But Einstein had even bigger plans. Perhaps, he mused, the universe could be explained by a "unified theory"—a single master framework that would describe physics out to the farthest reaches of the cosmos and down to the smallest speck of matter. Einstein relentlessly pursued a unified theory, but he ultimately came up empty-handed. To some extent, Einstein "failed" because many things about the workings of the universe were either still unknown or, at best, poorly understood during his lifetime.

**2. Speak on the topic:** Do you have a job? Speak about it. What company would you like to work for?

**3. Listen to the text and fill in the gaps:**

Many scientists say nuclear energy \_\_\_\_\_\_\_\_\_\_\_\_. Many normal people aren’t so sure. I think \_\_\_\_\_\_\_\_\_\_\_\_ worry about nuclear energy. We hear on the news about the dangers of nuclear power. Many years ago there was \_\_\_\_\_\_\_\_\_\_\_\_ in Chernobyl, Russia. A nuclear reactor caught fire and melted. Because of this, deadly radiation spread across \_\_\_\_\_\_\_\_\_\_\_\_ Europe. There were reports that sheep in England caught radiation sickness. I think things are safer now. Many countries trust nuclear energy. France and Japan \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of nuclear power stations. I think it’s probably a good idea. We really need to stop \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Nuclear power is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the environment. Perhaps we need to spend more money \_\_\_\_\_\_\_\_\_\_\_\_ safer.

Билет № 14

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

**The von Neumann Architecture of Computer Systems**

Any discussion of computer architectures, of how computers and computer systems are organized, designed, and implemented, inevitably makes reference to the “von Neumann architecture” as a basis for comparison**.** And of course this is so, since virtually every electronic computer ever built has been rooted in this architecture**.** Von Neumann’s design led eventuall**y** to the construction of the EDVAC computer in 1952. However, the first computer of this type to be actually constructed and operated was the Manchester Mark I, designed and built at Manchester University in England [Siewiorek, et al. 1982]. It ran its first program in 1948, executing it out of its 96 word memory. It executed an instruction in 1.2 milliseconds, which must have seemed phenomenal at the time. Using today’s popular “MIPS” terminology (millions of instructions per second**),** it would be rated at .00083 MIPS. By contrast, some current supercomputers are rated at in excess of 1000 MIPS. And yet, these computers, such as the Cray systems and the Control Data Cyber 200 models, are still tied to the von Neumann architecture to a large extent. Over the years, a number of computers have been claimed to be “non-von Neumann,” and many have been at least partially so. More and more emphasis is being put on the necessity for breaking away from this traditional architecture in order to achieve more usable and more productive systems. The expectations for the fifth generation systems seem to require that substantially new architectures be evolved, and that both hardware and software be freed from the limitations of the von Neumann architecture. We all know what the von Neumann architecture is, of course. At least we have strong intuitive feelings about it because this is what we have always used. This is “the way computers work.” But to really comprehend what choices there are for computer designers, to appreciate what new choices must be found, it is necessary to have a more definitive understanding of what the von Neumann architecture is and is not and what its implications are.

**2. Speak on the topic:**  The University or Institute you graduated from.

**3. Listen to the text and fill in the gaps:**

Global warming \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ problem in the world today. Everyone know about it but not everyone is trying to stop it. Many world leaders are more interested \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ countries for the crisis. Countries like China, India and Russia say they will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ America takes more action. America says it will not act \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ take more action. It seems a little childish that leaders are acting \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . The future of our world is at risk and governments \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with each other. Many presidents and prime ministers tell us that technology \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . They say future scientists will find solutions to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . This is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . I hope they are right. I don’t believe them, so I’ll continue switching off \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Билет № 15

1. Read and translate the text into Russian.
2. Summarize the text.
3. Be ready to discuss the text with the teacher.

**How Are Transistors Made?**

Although a single transistor resides on a tiny "chip" of crystalline silicon, transistors are manufactured in batches. The process begins with a thin circular "wafer," about the size and shape of a CD-ROM (compact disc-read only memory), that is sliced off a large cylinder of pure crystalline silicon. Imagine inscribing an imaginary square inside the circle on the surface of the wafer and partitioning the square into an N-by-N array containing N imaginary cells. A process called "photolithography" allows the creation of N2 transistors, one inside each cell, simultaneously. The wafer is coated with a substance, called "photo-resist," and then exposed to a black-and- white pattern as if the pattern were being photographed and the coated wafer were the film in the camera. The white areas of the pattern correspond to the upper surfaces of the end regions (called the emitter and collector) of all N2 transistors. Light hits the wafer in these white areas of the pattern and chemically alters the photo-resist there. The wafer is dipped in a solvent that dissolves away the chemically altered photo-resist, where the pattern had been white, but not the unaltered parts, where the pattern had been black. The wafer is then heated in an air-tight oven, filled with a gas of donor impurities. Although the wafer is not heated enough to melt the silicon, it is hot enough that some of the gas atoms diffuse from the surface into the body of the material. Donor impurities fix themselves into the crystal structure, but only under the open places in the photo-resist. The wafer is cooled and removed from the oven. The emitter and collector regions of N separate transistors have been embedded in the wafer. The patterned photo-resist is washed away and the wafer is given a second fresh coat of photo­resist. Again, the wafer is exposed to a black-and-white pattern, but this time the white areas of the pattern correspond to the upper surfaces of the control regions (called the base) of all N2 transistors. After similar chemical processing, the wafer is heated again in an air-tight oven, filled this time with a gas of acceptor impurities. They fix themselves into the crystal structure, but again only under the open places in the photo-resist. The wafer is cooled and removed from the oven. The base regions of N2 separate transistors have been embedded in the wafer, in between and touching the respective emitter and collector regions previously made. The N complete transistors are all disconnected from each other, but they are also disconnected from any wires. So, photolithography is performed a third time on the wafer.

**2. Speak on the topic:** *Tell about your laboratory and people who you work with.*

**3. Listen to the text and fill in the gaps:**

What \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology? Would we still be living in caves? Probably. I think there are two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology. The kinds before and after computers. When we think about technology before computers, it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It was all mechanical. Things like steam trains and fridges. At the time, that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology. But, today’s technology is really cutting edge. It’s the kind of technology that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ soon as it hits the shelves. I love this. It’s so exciting seeing it all happen. I love \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology we’ll have in the future, and then buy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It’s like buying technology from science fiction movies. I’d love to live to be 200 so I can see what technology.

Билет № 16

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher

**Weights and measures.**

Measurement is accomplished through the comparison of a measurement with some known quantity of the same kind. The term weights and measures signifies those standard quantities by which such comparisons are achieved. Standard quantities may be established arbitrarily or by reference to some universal constant Standards for different kinds of quantities may develop separately or may be integrated into logical systems of units. Originally standard measures were four in number: those for mass (weight), volume (liquid or dry measure), length, and area. To these have been added standard measurements of temperature, luminosity, pressure, electric current, and others. The earliest standard measurements appeared in the ancient Mediterranean cultures and were based on parts of the body, or on calculations of what man or beast could haul, or on the volume of containers or the area of fields in common use. The Egyptian cubit is generally recognized to have been the most widespread unit of linear measurement in the ancient world. It came into use around 3000 BC and was based on the length of the arm from the elbow to the extended finger tips. It was standardized by a royal master cubit of black granite, against which all cubit sticks in Egypt were regularly checked. One of the earliest known weight measures was the Babylon. The terms ounce, inch, pound, and mile come from the Roman adoption of earlier Greek measuring units. The Roman system of measurement persisted into the Middle Ages in Europe, but there was great diversity of standards. Thereafter various national governments made efforts to standardize their systems, producing a welter of often confusing units and standards. The British Imperial and U.S. Customary are two of the most elaborate such systems. The first proposal for what would later become the metric system was made by a French clergyman, Gabriel Mouton, around 1670, He suggested a standard linear measurement based on the length of the arc of one minute of longitude on the Earth's surface and divided decimally. Mouton's proposal was much discussed and refined, but it was not until 1795 that France officially adopted the metric system. Its spread throughout the rest of Europe was accelerated by the military successes of the French Revolution and Napoleon, but in many places it took a long time to overcome the nonrational customary systems of weights and measureainat had been used for centuries. Now the standard system in most nations, the metric system has been modernized to take into account 20th-century technological advances. In Paris in 1960 an international convention agreed on a new metric-based system of units. This was the Systeme Internationale (SI) Six base units were adopted: the metre (length),the kilogram (mass), the second (time), the ampere (electric current), the degree Kelvin (temperature), and the candela (luminosity).

**2. Speak on the topic:** *The cost of protecting the environment*

**3. Listen to the text and fill in the gaps:**

Every country \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ free healthcare to its citizens. I can’t understand why the richest countries in the world \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . It’s shocking that a country can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and let its people die because they cannot pay the hospital. I saw \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ once on America’s healthcare system. It’s called “Sicko,” directed by Michael Moore. He went to England and France \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that people in those countries didn’t have to pay when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hospital. He \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Cuba. He went with lots of Americans who couldn’t afford healthcare in America. Amazingly, the Cuban hospitals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for free \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ medicine. They were so happy. I’m sure there’s enough money \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to provide everyone with free healthcare.

Билет №17

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher.

In physics, a photon is an elementary particle, the quantum of the electromagnetic field and the basic "unit" of light and all other forms of electromagnetic radiation. It is also the force carrier for the electromagnetic force. The effects of this force are easily observable at both the microscopic and macroscopic level, because the photon has no rest mass; this allows for interactions at long distances. Like all elementary particles, photons are governed by quantum mechanics and will exhibit wave-particle duality - they exhibit properties of both waves and particles. For example, a single photon may be refracted by a lens or exhibit wave interference, but also act as a particle giving a definite result when quantitative mass is measured.

The modern concept of the photon was developed gradually by Albert Einstein to explain experimental observations that did not fit the classical wave model of light. In particular, the photon model accounted for the frequency dependence of light's energy, and explained the ability of matter and radiation to be in thermal equilibrium. It also accounted for anomalous observations, including the properties of black body radiation, that other physicists, most notably Max Planck, had sought to explain using semi classical models, in which light is still described by Maxwell's equations, but the material objects that emit and absorb light are quantized. Although these semi classical models contributed to the development of quantum mechanics, further experiments proved Einstein's hypothesis that light itself is quantized; the quanta of light are photons. In the modern Standard Model of particle physics, photons are described as a necessary consequence of physical laws having a certain symmetry at every point in space time. The intrinsic properties of photons, such as charge, mass and spin, are determined by the properties of this gauge symmetry. The photon concept has led to momentous advances in experimental and theoretical physics, such as lasers, Bose-Einstein condensation, quantum field theory, and the probabilistic interpretation of quantum mechanics. It has been applied to photochemistry, high-resolution microscopy, and measurements of molecular distances. Recently, photons have been studied as elements of quantum computers and for sophisticated applications in optical communication such as quantum cryptography.

2. Speak about the University or Institute you graduated from.

**3. Listen to the text and fill in the gaps:**

The universe is a big place. I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can understand just how big. The universe never, ever ends. It \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ size. It’s funny when scientists say they want to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the universe. That’s impossible. There are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ secrets out there. The universe has given us an adjective in English \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When we say something is universal, it doesn’t make sense. That’s because we’re saying \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ happens all around the universe, when in fact, it only happens on Earth. Another \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the word universe is that people talk about their universe. Sometimes they say their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when something sad happened. Scientists even call our brain a mini universe.

Билет №18

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher.

**Human 2.0**

IN 2003, Time magazine organised a "Future of Life" conference celebrating the 50th anniversary of Watson and Crick's discovery of the structure of DNA. All the speakers - myself included - were asked what we thought the next 50 years would bring. Most of the predictions were short-sighted. James Watson's own prediction was that in 50 years, we'll have drugs that allow us to eat as much as we want without gaining weight. "Fifty years?," 1 replied. In my opinion that's far too pessimistic. We've already demonstrated it in mice, and human drugs using the relevant techniques are in development. We can expect them in five to 10 years, not 50.

The mistake that Watson and virtually every other presenter made was to use the progress of the past 50 years as a model for the next half-century. I describe this way of looking at the future as the "intuitive linear" view: people intuitively assume that the current rate of progress will continue for future periods. But a serious assessment of the history of technology reveals that technological change is not linear, but exponential.

You can examine the data in different ways, on different timescales and for a wide variety of technologies, ranging from electronic to biological. You can analyse the implications, ranging from the sum of human knowledge to the size of the economy. However you measure it, the exponential acceleration of progress and growth applies.

Understanding exponential progress is key to understanding future trends. Over the long term, exponential growth produces change on a scale dramatically different from linear growth. Consider that in 1990, the human genome project was widely regarded as controversial. In 1989, we sequenced only one-thousandth of the genome. But from 1990 onwards the amount of genetic data sequenced doubled every year- a rate of growth that continues today - and the transcription of the human genome was completed in 2003. We are making exponential progress in every type of information technology. Moreover, virtually all technologies are becoming information technologies. If we combine all of these trends, we can reliably predict that, in the not too distant future, we will reach what is known as The Singularity. This is a time when the pace of technological change will be so rapid and its impact so deep that human life will be irreversibly transformed. We will be able to reprogram our biology, and ultimately transcend it. The result will be an intimate merger between ourselves and the technology we are creating. The evidence for this ubiquitous exponential growth is abundant. In my new book, The Singularity is Near, I have more than 40 graphs from a broad variety of fields, including communications, the internet, brain scanning and biological technologies, that reveal exponential progress. Broadly speaking, my models show that we are doubling the paradigm-shift rate (roughly, the rate of technical innovation) every decade.

**2. Speak on the topic:** What’s you job? What company would you like to work for?

**3. Listen to the text and fill in the gaps:**

X-rays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They were invented a really long time ago. I think when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, they were real, cutting edge technology. I think a lot of people \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ could see photos of the inside of their body. So OK, it's only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but still, that was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fifty years ago. Today, we all have X-rays. Even when we go to the dentist, we have X-rays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Of course, X-rays are not just used in hospitals. Every time we go to an airport \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ through an X-ray machine. The security guys can check to see if we have anything dangerous. Recently, I have seen X-ray machines in all kinds of places – even hotels. I even \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ schools.

Билет № 19

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher.

**Neighborhood Darkness**

Does dark matter encircle Earth and heat up the gas giants?

Dark matter is five times as abundant as norma! matter in the universe. But it continues to be an enigma because it is invisible and nearly always passes right through norma! matter.

Astronomers only found out about dark matter by inferring its presence from the gravity it exerts—notably, it keeps spinning galaxies from flying apart. Rather than peering at distant galaxies to study it, though, astronomers might want to look closer to home: dark matter could be exerting measurable effects in our own solar system Specifically, investigators should target Earth and the moon, Insists theoretical physicist Stephen Adler of the institute for Advanced Study in Princeton, N.J. if the mass of Earth and the moon when measured together seems greater than their masses separately, he explains, the difference could be attributed to a halo of dark matter in between. Adler reaches this conclusion in part after examining studies that measured the mass of the moon with lunar orbiters and that of Earth with the LAGEOS geodetic survey satellites— laser-beam-reflecting spheres that have been in orbit for many year; now. Lasers fired at the satellites reveal the radius of each satellite's orbit and how long each takes to complete that orbit. From such measurements, scientists can calculate the gravitational pull on the satellites and, hence, the amount of mass exerting that pull.

Next Adler examined research that gauged the distance from Earth to the moon with lasers reflecting off lunar mirrors planted by the Apollo missions, if Earth exerts an unusually stronger pull on the moon, which lies roughly 384,000 kilometers out, than on the LAGEOS satellites, about 12,300 kilometers away, the added pull could be attributed to a dark matter halo between the moon and the artificial satellites. Based on current data, Adler estimates in the October 17 Journal of Physics A that at most some 24 trillion metric tons of dark matter lies between Earth and the moon. Such a dark matter halo might explain the anomalies seen In the orbits of the Pioneer, Galileo, Casslni, Rosetta and NEAR mission spacecraft, he adds. Adier also speculates that dark matter could exert dramatic effects on the four gas giants in our solar system. Jupiter, Saturn Uranus and Neptune, if these massive worlds have gravitationally captured dark matter, then dark matter particles could smash into them—rare events but enough to heat up the gas giants and account for why the insides of these planets (and even Earth) seem hotter than known mechanisms can explain. It might also account for why Uranus seems anomalously cold— the planet is bizarrely tilted, perhaps because of a colossal impact, and Adier surmises that this collision might have knocked away most of the dark matter cloud that might typically have heated Uranus.

**2. Speak about** our University and its history.

**3. Listen to the text and fill in the gaps:**

Many scientists say nuclear energy \_\_\_\_\_\_\_\_\_\_\_\_. Many normal people aren’t so sure. I think \_\_\_\_\_\_\_\_\_\_\_\_ worry about nuclear energy. We hear on the news about the dangers of nuclear power. Many years ago there was \_\_\_\_\_\_\_\_\_\_\_\_ in Chernobyl, Russia. A nuclear reactor caught fire and melted. Because of this, deadly radiation spread across \_\_\_\_\_\_\_\_\_\_\_\_ Europe. There were reports that sheep in England caught radiation sickness. I think things are safer now. Many countries trust nuclear energy. France and Japan \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of nuclear power stations. I think it’s probably a good idea. We really need to stop \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Nuclear power is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the environment. Perhaps we need to spend more money \_\_\_\_\_\_\_\_\_\_\_\_ safer.

Билет № 20

1. Read and translate the text into Russian.

2. Summarize the text.

3. Be ready to discuss the text with the teacher.

**Quantum Computers: Towards the Future**

**Background**

The computers of the early 1950s had several miles of wiring, hundreds of vacuum tubes, and often weighed several tons. Today's computers operate under the same principles. Data is represented by either a 0 **or** a 1—the binary system. The binary state is determined by something such as the magnetic state of a part of a disk, or by a pit or groove on a compact disc. For example, the number 123 is expressed as 111 1011 in binary. This forms the basis for all of classical computers, completely obeying the laws of classical mechanics, which until Max Planck first introduced the ideas underlying quantum mechanics were the only way we understand how our universe works. With the advent of quantum mechanics, we were able to explore the rules that govern particle interactions on the atomic scale and smaller. More recently, we are learning to control extremely small systems and manipulate them to perform calculations—quantum computing. For decades, the computing industry has kept pace with Moore's Law, which says processing power will double every 18 months. With classical computers, that has a limit. New technology will have to be introduced at a point, and quantum computers are likely to emerge to continue the trend.

**Qubits**

Information expressed by a particle in a quantum system (a quantum bit, or qubit) can possess 4 states: 1, 0, and a superposition of these states. Qubits are operated on through a quantum gate, which causes a unitary transformation. This can be simulated on a classical computer, but with a quantum "computer, the process is exponentially faster. Five hundred qubits could perform operations on 2A500 digit numbers very rapidly, while it would take classical computers years to do the same.

**The First Quantum Computers**

Early quantum computing systems used nuclear magnetic resonance (NMR), where the state of each qubit is determined by direction of the nuclear-magnetic dipole, which will act on an external magnetic field . This technique requires a massive number of molecules to determine the result of the calculation, and js difficult to do to begin with using larger molecules. As a result, scaling this method to tasks involving many qubits would be impractical at best. This method was declared to be superior to the ion-trap model, where qubits are formed in large groups of ions and couple by the Coulomb interaction.

**2. Speak about:** What do you know about the most famous British universities?

**3. Listen to the text and fill in the gaps:**

X-rays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They were invented a really long time ago. I think when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, they were real, cutting edge technology. I think a lot of people \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ could see photos of the inside of their body. So OK, it's only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but still, that was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fifty years ago. Today, we all have X-rays. Even when we go to the dentist, we have X-rays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Of course, X-rays are not just used in hospitals. Every time we go to an airport \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ through an X-ray machine. The security guys can check to see if we have anything dangerous. Recently, I have seen X-ray machines in all kinds of places – even hotels. I even \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ schools.

**3.4.2. Критерии оценивания ответа магистранта на экзамене.**

Примерная форма оценки ответа магистранта на экзамене

|  |  |  |
| --- | --- | --- |
| Требования к знаниям | Баллы | Оценка |
| Оценка «отлично» выставляется магистранту, если:  -он глубоко и прочно усвоил учебный материал;  - -владеет всеми необходимыми навыками работы с текстом;  -умеет переводить текст по профессиональной тематике на русский язык со словарём;  - демонстрирует умения извлекать необходимую информацию из устных и письменных источников делового характера без словаря;  - демонстрирует умение вести монологическую и диалогическую речь на иностранном языке;  - свободно отвечает на вопросы экзаменатора. | 90-100 | отлично |
| Оценка «хорошо» выставляется магистранту , если:  -он твёрдо знает материал, но не достаточно усвоил детали;  -не допускает существенные ошибки, неточности в изложении материала;  -хорошо отвечает на поставленные вопросы;  - достаточно хорошо владеет необходимыми навыками работы с текстовым материалом. | 75-89 | хорошо |
| Оценка «удовлетворительно» выставляется магистранту, если:  -он проявляет знания только основных понятий и явлений, изучаемых по программе, но не усвоил деталей ;  -допускает существенные ошибки при изложении материала, при чтении и пересказе;  -испытывает затруднения при выполнении перевода;  -не может полно отвечать на вопросы экзаменатора. | 60-74 | удовлетворительно |
| Оценка «неудовлетворительно» выставляется магистранту, если:  -он не владеет значительной частью учебного материала;  -допускает грубые ошибки при изложении материала;  - не владеет навыками чтения;  - не владеет навыками пересказа;  -не владеет навыками перевода на русский язык;  -не в состоянии ответить на вопросы экзаменатора. | ниже 60 | неудовлетворительно |

Промежуточная аттестация студентов по дисциплине «Иностранный язык» проводится в соответствии с ООП и является обязательной.

На экзамене проверяется уровень владения материалом, предусмотренного программой.

Студент допускается к экзамену по дисциплине в случае выполнения им учебного плана по дисциплине в форме выполненных и представленных видов работ. В случае наличия учебной задолженности студент отрабатывает пропущенные занятия в форме, предложенной преподавателем и представленной в настоящей программе.

Экзамен принимает ведущий преподаватель. Экзамен проводится в устной форме по утверждённым билетам. Экзаменатору предоставляется право задавать студентам дополнительные вопросы сверх билета, а также, помимо теоретических вопросов, задавать вопросы, связанные с профессиональной деятельностью. При проведении экзамена могут быть использованы технические средства. Количество вопросов в экзаменационном билете – 3, два из которых с практико-ориентированными заданиями.

1. [↑](#footnote-ref-1)